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1. INTRODUCTION

Transformer Winding Machine Controller is a multi-purpose designed controller, to meet various requirements. Additional settings can be configured to provide flexibility for related applications. It contains integral stepper motor drive, DC motor drive, brake and power supply control circuit in a single control box. It is a product of winding machine controller series, generally used in Transformer Winding machines.

Whenever any Power Failure occurs then all current parameter (i.e Turn Counting, Guiding Traverse position, Current Steps etc.) values are moved to E\(^2\)PROM. Next time when the machine is Switched ON then the processor will read all parameter values from the E\(^2\)PROM, so that the work can be resumed from the last state.

CNC-07SG : With 1/2hp DC motor driver for winding spindle and 2A stepper motor driver for guiding traverse.

CNC-07SGE1 : With winding spindle control interface circuit and 2A stepper motor driver for guiding traverse.

CNC-07SGE2 : With winding spindle motor control interface circuit and guiding traverse stepper motor control interface circuit.

2. FEATURES

- Micro controller based controls, easy to program and operate.
- Password protected controls.
- Winding speed can be controlled.
- Design to meet various requirement of machine manufacturers.
- Multi program storing capability.
- Each program provides independent operation mode selections.
- Memory to store program. (There is no loss of current data even if Power Failure occurs. The unfinished work can be resumed from the last state when machine is Switched ON.)
- Easy customized calibration options for machine manufacturer.
- It's speed controller is useful for minor winding.
- Controls holding and running current.
- Regulated DC drive for winding motor.
- Single logic board for all drives and functions.
3. FRONT PANEL DESCRIPTION

3.1. Power switch:

Power supplier equipped, controls the AC power to the controller

3.2. Keys Description:

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROCESS SETTING</td>
<td>To enter data input.</td>
</tr>
<tr>
<td>OUTPUT SETTING</td>
<td>Set target production.</td>
</tr>
<tr>
<td></td>
<td>During ready mode, press this key and holding for two second, reduce PIECE COUNTER by one.</td>
</tr>
<tr>
<td>INPUT</td>
<td>To enter data in to memory.</td>
</tr>
<tr>
<td></td>
<td>To enter numeric values.</td>
</tr>
<tr>
<td></td>
<td>Clear current data to zero.</td>
</tr>
<tr>
<td></td>
<td>To copy parameter.</td>
</tr>
<tr>
<td></td>
<td>To enter start step number.</td>
</tr>
<tr>
<td></td>
<td>To enter end step number.</td>
</tr>
<tr>
<td></td>
<td>To enable/disable auto home position.</td>
</tr>
<tr>
<td></td>
<td>To enable/disable auto start.</td>
</tr>
<tr>
<td></td>
<td>To select parameter.</td>
</tr>
<tr>
<td></td>
<td>To move the traverse reverse. during ready mode</td>
</tr>
<tr>
<td>FEED DIR.</td>
<td>To select wire feed direction.</td>
</tr>
<tr>
<td>WIND DIR.</td>
<td>To select winding direction.</td>
</tr>
<tr>
<td>LEN VERS</td>
<td>To enable/disable pause winding after each layer.</td>
</tr>
<tr>
<td>START</td>
<td>To start/resume winding.</td>
</tr>
<tr>
<td>STOP</td>
<td>To pause winding.</td>
</tr>
<tr>
<td>RESET</td>
<td>To reset the machine.</td>
</tr>
<tr>
<td>BACK</td>
<td>During programming mode move to previous step.</td>
</tr>
<tr>
<td>SKIP</td>
<td>During programming mode move to next step.</td>
</tr>
<tr>
<td>BRAKE</td>
<td>Enable/disable brake in stand by mode.</td>
</tr>
<tr>
<td>AUTO</td>
<td>Enable/disable auto running mode.</td>
</tr>
<tr>
<td>RPM</td>
<td>To monitor winding speed in RPM.</td>
</tr>
<tr>
<td>ZERO</td>
<td>Reset current production reading to zero.</td>
</tr>
<tr>
<td></td>
<td>To move the traverse forward. during ready mode</td>
</tr>
</tbody>
</table>
3.3. Display Indicators:

**Process**

Show the current step number, in programming the parameters and in winding process.

**Data**

During programming, in combination with LED, shows the parameter being programmed. During winding or ready mode, shows the current number of turns or show the guiding traverse shaft position.

**Rotate/Output**

Displays winding speed (RPM) and set/completed output.

3.4. Status indicators

**Process Indicators:**

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAND BY</td>
<td>ON</td>
<td>Controller ready.</td>
</tr>
<tr>
<td>RUN</td>
<td>ON</td>
<td>Winding in progress.</td>
</tr>
<tr>
<td>RESET</td>
<td>ON</td>
<td>Complete machine reset.</td>
</tr>
<tr>
<td>L-SPEED</td>
<td>ON</td>
<td>Low speed winding.</td>
</tr>
<tr>
<td>H-SPEED</td>
<td>ON</td>
<td>High speed winding.</td>
</tr>
<tr>
<td>FUNC</td>
<td>ON</td>
<td>Move the traverse.</td>
</tr>
</tbody>
</table>

**Winding parameter Indicators:**

<table>
<thead>
<tr>
<th>LED</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.POINT</td>
<td>Starting point of winding.</td>
</tr>
<tr>
<td>BREADTH</td>
<td>Width of bobbin.</td>
</tr>
<tr>
<td>WIRE DIA.</td>
<td>Wire diameter.</td>
</tr>
<tr>
<td>TURN NO.</td>
<td>Number of turns.</td>
</tr>
<tr>
<td>SLOW START</td>
<td>SLOW START value.</td>
</tr>
<tr>
<td>SLOW STOP</td>
<td>SLOW STOP value.</td>
</tr>
<tr>
<td>HIGH SPEED</td>
<td>% high/low speed of maximum winding speed.</td>
</tr>
<tr>
<td>LOW SPEED</td>
<td></td>
</tr>
<tr>
<td>SETTING</td>
<td>Sensor Selection Mode &amp; process delay time.</td>
</tr>
</tbody>
</table>

**Monitoring Indicators:**

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROTATE SPEED</td>
<td>ON</td>
<td>Winding speed in RPM.</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>ON</td>
<td>Total production.</td>
</tr>
<tr>
<td>COMPLETE</td>
<td>ON</td>
<td>Production complete.</td>
</tr>
</tbody>
</table>

CNC-07SG USER MANUAL
4. MEMORY RANGE SELECTION
CNC-07SG contains 1000 memory step. By defining the region, users can effectively manage the memory. Various winding parameter can be stored in different regions and can be retrieved instantaneously. After specifying the regions, programming and winding can be done in those regions, all un-selected regions will retain their original contents and unmodified.

4.1. Specifying starting step
During ready mode, press \[\text{START PROCESS} \rightarrow 0-999 \text{ INPUT}\] to set. [Setting range 0 ~ 999].

4.2. Specifying ending step
During ready mode, press \[\text{END PROCESS} \rightarrow 0-999 \text{ INPUT}\] to set. [Setting range 0 ~ 999].

When setting the PROCESS number, the Ending step number must be larger than the Starting step number, or the winding operation will not start. If during programming, the displayed PROCESS number is the desired number, just press the \[\text{CLR}\] key. If a wrong number is entered, simply press \[\text{CLR}\] to zero the value and re-enter the correct number.

5. PROGRAMMING WINDING PARAMETER
5.1. Winding parameters definitions

- **S.POINT**: Starting position of the guiding traverse, measured from the home position of the guiding traverse. [Setting range from 0.00 ~999.99 mm].

- **BREADTH**: The traverse of the copper wire led by the traverse during winding. [Setting range from 0~ 999.99 mm].

- **WIRE DIA.**: Diameter of the copper wire. [Setting range from 0 to 9.999mm].

- **TURN NO.**: Total number of turns to be wound. [Setting range from 0.0 to 9999.9 or 0 to 99999 turns].

- **SLOW START**: Number of turns to be wound at low speed, when start winding. [Setting range from 0 to 999.9 turns].

- **SLOW STOP**: Number of turns to be done at low speed prior to stopping. [Setting range from 0 to 999.9 turns].

- **HIGH SPEED**: High winding speed. [Setting range 0 ~99%].

- **LOW SPEED**: Low winding speed. [Setting range 0~99%].

- **SETTINGS**: Sensor Selection Mode & process delay time.
5.2. Options definitions

- **Forward or Reverse**: To select guiding direction, forward or reverse from the starting point.
- **Clockwise or Anti-Clockwise**: To select winding direction, clockwise or anti-clockwise.
- **Suspend Winding**: To specify whether to suspend winding when the guiding traverse moves to the two edges of the width.
- **Return to Starting Position**: To select whether guiding traverse returns to the starting position automatically or upon a manual pressing of the key.
- **Start Automatically**: To select whether winding start automatically or upon manual pressing of the key.

5.3. Programming winding parameter

In **STANDBY** mode, press **PROCESS** to invoke programming mode for the winding parameters. First, the START PROCESS number will show at PROCESS DISPLAY, the parameter indicator S.POINT will it, the starting position will show at DATA DISPLAY. The starting position can be changed to the new position by pressing the numerical key followed by key or pressing key if no change is necessary.

After setting the starting position, the PROCESS number in the PROCESS DISPLAY will automatically increase by one. Continue with the starting position selection for the next step. When the PROCESS number larger then the END PROCESS number, the PROCESS number will restore to the START PROCESS number and the indicator light will change from S.POINT to BREADTH for user to proceed to specifying the width for each PROCESS. Repeat the same procedure using numerical keys and the key, all winding parameters for each PROCESS can thus programmed.

The following functions are also available:

- **CLR**: Clear the current value to zero.
- **COPY**: Copy the content of the previous step to the current step; invalid when programming the first step.
- **-**: Go back to the previous programming step.
- **DOWN**: To scroll through different parameters.
- **SPO**: Change guiding direction for current step.
- **WIND**: Change winding direction for current step.
- **TWO**: Change TWO-EDGE STOP selection for current step.
- **ST**: Change AUTO POSITIONING selection for current step.
- **ST**: Change AUTO START selection for current step.

Each time when change the PARAMETER or OPTIONS (the last five of the above function), key must pressed to effect the change. The five options
can be changed during programming any parameter in current step. Using the above procedure, all winding PARAMETERS and OPTIONS of each step can be set and checked. After finishing programming, press key once and get out of programming mode and the guiding traverse will reposition the starting position and go into READY mode.

5.4. Setting Parameter

**SETTING** There are two function in setting parameter.
1.) Delay Time Setting
2.) Sensor Selection.

**DELAY** time can be define for delay time between each winding step and it shows in the display (del - 0)

DELAY TIME RANGE (0.0 - 0.9) Second.

**SENSOR** (SE 0): 0-Represents first sensor selection, 1 Represents double sensor selection (If the sensor selection mode having the value is 1 then, sensor selection is show in the setting parameter otherwise it not show in setting parameter.)
6. **WINDING METHOD SELECTION**

Prior to winding, the general winding principles are explained below so the operators can have a better understanding of the performance of the controller and make better use of it.

6.1. **Absolute counting**

Using absolute counting, winding spindle shaft is capable of fixed-point stopping. Upon each restart, the turn count will reset only the integer portion of the turn number to zero, with the decimal unchanged. For example, for a previous number of 100.3 turns, when restarting the next winding, the counting will start with 0.3 turn to avoid accumulation of spindle shaft free play error from consecutive windings.

This counting method may cause insufficient winding by one turn, (e.g., a new winding starting from 0.9) Therefore, when starting from 0.5~0.9, the winding spindle shaft will turn to the 0.0 before it starts counting.

6.2. **Relative counting**

This counting method zeros the counter upon each restart, therefore it is easy to understand and will not cause insufficient winding. However, it is only suitable for usual applications such as audio coils and inductance coils but not suitable for fix-point tapping applications such as transformers.

6.3. **Correct setting turns**

**Preset method**

Set the S.STOP to zero first and then set the TURNS to the desired number. Set proper parameters according to copper wire, bobbin, tension, etc, then press to start winding. When finished, obtain the actual number of turns and calculate the number of overshoot turns. Go into programming mode and subtract the number of the overshoot turns from the TURNS to obtain the required setting.

This method has a higher throughput, however, the resulting stopping location may not be precise.
High-Low speed method
This method uses a combination of H.S./L.S. and S.STOP to achieve the desired number of turns. The L.S. should not be too high. The number of S.STOP turns must be adequate to allow the spindle shaft to slow down to low speed before reaching the total number of turns. This can result in precise stopping location.

Multiple-brakes method
When the count of winding turns of winding shaft reaches the S.STOP value, then first brake for a short period is applied which will slow down the speed. After that multiple soft brakes are applied before 1 turns of remaining turns. This method will help in accuracy and makes long life of Brakes.

6.4. Interlace wire-guiding
If the BREADTH of the step is zero, the wire guiding becomes interlace mode. When it begins winding, the wire-guiding will follow the wire direction to proceed two wire diameters and regress one wire diameters cyclically until the step of winding ends. This mode especially suits the inductor winding.

6.5. Non wire-guiding
Sometimes, the winding device may be used to winding adhesive tapes or copper foil. In this case the wire guiding is not needed. To achieve this the WIRE DIA may be adjusted to zero so that wire guiding won't move.

6.6. Continual mode
Before it begins winding, if that step S.POINT set as 999.99, then the starting position, the width, the wire-guiding direction and the winding direction won't be re-read. The values are not changed, that is, the wire guiding will continue guiding wires on the same position. The width and left-right margins are the same as the ones of the previous section. Both the wire-guiding and winding directions are not changed, either. This mode especially suits to winding which have the multiple drawing tops in the same sets of coils. (e.g., Transformer winding)
7. WINDING EXECUTION

7.1. To start winding
After set up all data items, press START key to begin winding process in accordance with the set-up content. Press STOP key to pause winding.

The following key functions are available during PAUSE mode:
- BACK: Give up the numbers of the winding turns and regress one step.
- MAP: Finish current step and proceed to next step.
- START: Continue winding.
- RESET: Give up winding and go back to the READY mode.

7.2. To switching the winding speed
During winding, press the 0 key, the winding speed can be switching between HI speed and LOW speed.

7.3. Piece count display
Upon turning on the POWER SWITCH, PIECE COUNT DISPLAY will shows the number of piece produced. During winding, each time the CONTROLLER goes from the START PROCESS to the END PROCESS the piece counter will automatically increase by one.

7.4. Decrease piece counter
During READY or PAUSE mode, press the - key and holding down for two second, the piece counter will decrease by one.

7.5. Reset piece counter
During READY or PAUSE mode, press ZERO key and holding down for two second, will set the piece counter to zero.

7.6. Preset piece counter
In READY mode, press OUTPUT SAVING key once and key in desired values 0~99999 followed by the INPUT key. When the PIECE COUNTER reaches its preset value then FINISH led will lit. [Setting range 0~99999].

7.7. RPM display
Pressing RPM key will cause the PIECE COUNT DISPLAY to display the spindle shaft RPM without interrupting the counting. Pressing RPM again will change the PIECE COUNT DISPLAY back to displaying the piece count.
8. CONFIGURATION SETTING

CNC-07SG is multi-purpose designed controller, to meet various requirements. Additional settings can be configured to provide flexibility for related applications.

In the READY mode, pressing the following keys combination as described in below section’s (8.1 to 8.8) will display each parameter on DATA DISPLAY. Press \[ \text{INPUT} \] key to get into change mode and then change the parameter value by pressing the numeric key followed by the \[ \text{INPUT} \] key.

If no change required then press \[ \text{INPUT} \] key to go back to READY mode.

8.1. Winding mode selection

In this function the PROCESS display and the DATA display will show eight digits, representing eight winding mode selections respectively.

Press numerical keys as below can change each digit.

![Numerical keys example]

1 Moving speed : Select the guiding traverses moving speed.
   0 represents high speed; 1 represents low speed.

2 Moving increment : Select the guiding traverses moving increment.
   1 represents 0.01mm (4 mm per revolution).
   2 represents 0.02mm (8 mm per revolution).
   4 represents 0.04mm (16 mm per revolution).
   0 represents to manually selection of displacement of traverse. which is depends on the selection of traverse pitch.

3 Counting mode : Select the turns counting mode.
   0 represents with zero point and using absolute counting mode.
   1 represents without zero point and using relative counting mode.

4 Edge slow : Slow down the winding speed before the guiding traverse reach to the two edges of the width.
   0 represents not slow down; 1 represents to slow down.

5 Braking mode : Select the braking mode of the winding spindle.
   0 represents single brake mode; 1 represents double brake mode.
6 Counting unit: Select 0.1 or 1 turns as your count unit.
   0 represents 0.1(0.0 to 9999.9 turns); 1 represents 1(0 to 99999 turns).

7 Sensor Selection Mode: Select 0 Represents single sensor mode, select 1 represents double sensor mode.
   (when double sensor mode is activate each turn unit is 1)

8 Operation mode: Select operation mode for the START switch.
   0 represents Level mode; 1 represents Trigger mode.
   The [start] on the panel always as the trigger mode.

8.2. Station number

Set the station number of the winding machine controller. This number is used to identify the station when using RS-485 communication function. Up to 32 stations can be operated on the same bus. [Setting range 01 ~99].

8.3. Password

This password is used to protect the setting data in memory. After you set this password, you cannot change any winding parameter and configuration data in normal sequence. You have to key in four numbers of password before press the keys. If the password has been passed once, you can change any data in normal sequence until you turn off the power or press [start] key. You must to remember the password or you cannot change any data. [Setting range 00000~99999]. Set 00000 means no password. [Password Clear: To clear password press following key.]

8.4. Travel limit

Set the maximum travel distance of guiding traverse. During winding if the guiding traverse reaches this position, the motor stop winding immediately, and the DATA DISPLAY shows error massage, then RESET and go back to the READY mode. [Setting range 000.00~999.99]. Set [999.99] means no limit.
8. 5. Fixed location

To set how often, must be correct the guiding traverse location. Each time when finish this number of product pieces, the guiding traverse will moves to the home position to correct the location before moving to starting position. [Setting range 00~99]. Set 00 means not to do this function.

8. 6. Limited winding speed

This value is to limited winding speed and make sure the winding spindle shaft and guiding traverse are in synchronization. The controller uses this value to calculate with wire BREADTH of current step, and then to limited maximum winding speed of current step. [Setting range 0~99999]. Set 0 means not to do this function.

8. 7. Braking action time

To set the holding time for brake. [Setting range 0.1 to 9.9 sec].

8. 8. Positioning speed of Guiding traverse

To set the moving speed of guiding traverse. [Setting range 0 to 99%].

8. 9. Guiding Traverse Calibration

This parameter are used to manually modify the value of traverse pitch, which depends on the selection of guiding traverse. Power off the controller and manually rotate guiding traverse motor 360 degree and measure the displacement of guiding traverse in micro-meter resolution (0.001mm) and note down.

Press and enter the noted value followed by key. [Setting range 1.000 ~ 16.000].
9. **DATA TRANSFER**

In READY mode press following keys combination to transfer settings data from one station to the other stations using RS-485 interface.

- \(00 \sim 99\) : means stations number.
- : Transfer configuration setting to specified station.
- : Transfer winding parameters to specified station.
- : Transfer password to specified station.

During configuration settings transfer, it will transfer settings parameters from START PROCESS to END PROCESS.

10. **ERROR MESSAGE**

When a fault occurs during operation, the DATA DISPLAY shows error message and stops winding. Then it will RESET and go back to READY mode.

- **Err-0** : The parameters or data in memory are fault.
- **Err-1** : The S.POINT value exceeds the Travel Limit.
- **Err-2** : During winding, the guiding traverse moves over the Travel Limit
- **Err-3** : During winding, the guiding traverse moves over the Home Position.
- **Err-5** : RS-485 communication error.
- **Err-6** : Current speed of guiding traverse should less from required speed.

11. **ADJUSTMENT**

![Diagram](attachment:image.png)

**CNC-07SG**
SCE-CT02

**CNC-07SGE1/CNC-07SGE2**
SCE-CT02
11.1. Adjustments for CNC-07SG

**CL:** Maximum output current limit.
1. Locking the winding spindle shaft, to make it cannot move; connect a DC Amperes meter between terminal and DC motor. (See Figure-1).
2. Rotate CL to the left end [L], set the winding parameter H.S. and L.S. in 50. Then press [ ] key to start winding.
3. Rotate CL in clockwise to set limited current, show on Amperes meter. (Limited current = 2A when using DC 180 volt motor). (Limited current = 4A when using DC 90 volt motor). (The CL have been set by factory before delivery. Only adjust it when change dc motor and replace power card).

**MAX:** Maximum winding speed.
1. Set the winding parameter H.S., L.S. in 99, and press [ ] key to change the DISPLAY shows RPM. Then press [ ] key to start winding.
2. Rotate MAX potentiometer to make the winding speed (RPM) as you want. Then press [ ] key to stop winding.

11.2. Adjustments for CNC-07SGE1/CNC-07SGE2

**MAX:** Maximum winding speed. (Speed control mode must be select in SPEED mode).
1. Set the winding parameter H.S. and L.S. in 99, and press [ ] key to change the PIECE COUNT DISPLAY shows RPM. Press [ ] key to start winding.
2. Rotate MAX potentiometer to make the winding speed (RPM) as you want.

**H/L-SPEED:** Speed control mode. Select by JP2 (see Figure-1).
1. H/L mode: Select HI-LOW output for speed control.(Open collector)
2. SPEED mode: Select DC 0~10V output for speed control.

**1C/2C Pulse output mode.** Select by JP1 (see Figure-1). CNC-07SG2 only.
1. 1C mode: PUS means pulse output, DIR means rotation direction output.
2. 2C mode: PUS means CW pulse output, DIR means CCW pulse output.
The zeroing disc is not served with the controller. If you need a zero point for the winding spindle, you have to make a zeroing disc as below, and assemble it with counting disc as above.

ZEROING DISC

Unit=mm

11.3.CN2-CN6 wiring diagram for CNC-07SG/E1/E2
12. INSTALLATION AND WIRING

12.1. Requirement and Safety precautions

1. The controllers should be operated in an environment that is protected from moisture, corrosive gases, or liquid, and free from airborne dust, metallic particles, and magnetic noise.
2. Make sure that the power source supplies the correct voltage and is capable of supplying the required current to the controllers.
3. Do not connect or disconnect wires and connectors while power is applied to the controller.
4. Make sure the machine and controllers are properly grounded.
5. Make sure that the leads and connectors are connected correctly.
6. Normally operate under 10 °C~ 50 °C environment, Over 40 °C should perform under good ventilation, avoid heating.

12.2. Counting system assembly

The counting disc and the TURN SENSOR must be assembly as below.
12.3. Terminal wiring diagram for CNC-07SG

12.4. Terminal wiring diagram for CNC-07SGE1
12.5 Terminal wiring diagram for CNC-07SGE2

12.6 Internal wiring diagram for CNC-07SG
13. MAINTENANCE AND TROUBLESHOOTING

13.1. Periodically maintenance

Following parts listed below must be maintained or replaced periodically if required for smooth functioning and long life of controller. The life of these part depends on the operating method and environmental conditions.

For any parts replacement, please contact our customer support.

<table>
<thead>
<tr>
<th>NO</th>
<th>Parts name</th>
<th>Life guide line</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Winding spindles Turns counter <strong>TURNSENSOR</strong></td>
<td>3 years</td>
</tr>
<tr>
<td>2</td>
<td>Guiding traverses <strong>HOMESensor</strong></td>
<td>3 years</td>
</tr>
<tr>
<td>3</td>
<td><strong>COOLING FAN</strong>(DC 24V 6cm)</td>
<td>10,000 hours</td>
</tr>
<tr>
<td>4</td>
<td><strong>RELAY</strong> (On the Power Card, it is used for switching the winding direction)</td>
<td>100,000 times</td>
</tr>
<tr>
<td>5</td>
<td>Carbon <strong>BRUSH</strong> in the DC motor</td>
<td>1 year</td>
</tr>
</tbody>
</table>

13.2. Troubleshooting

This section provides useful troubleshooting information to the users, and it helps in understanding different fault conditions with their possible solutions.

<table>
<thead>
<tr>
<th>NO</th>
<th>Fault Description</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| 1  | Power ON, but the Controller not on. | a. Check AC power input.  
b. Check the fuse on back panel.  
c. Check power switch and wire connections between Power card (SGE-CT02) and Power switch. |
| 2  | Fuse failure | a. Replace fuse.  
b. Replace SGE-CT02/SGE-CT02E. |
| 3  | Power ON, but the display Shows nothing. | a. Check LED on the SGE-CT02 power card. If not lit, replace SGE-CT02.  
b. Replace SGE-TFRC (CPU Card).  
c. Replace Key Panel. |
| 4  | Power ON, but the display shows confusion message, | a. Check wire connections between SGE-CT02 And SGE-TFRC.  
b. Replace SGE-CT02.  
c. Replace SGE-TFRC. |
<p>| 5  | Guiding traverse by default moves more than set value. | a. Check Configurations Gear Ratio setting. |</p>
<table>
<thead>
<tr>
<th>NO</th>
<th>Fault Description</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>READY LED lit, but cannot edit parameters.</td>
<td>a. Key in 5 digits password before Process Setting. (If the password has been set).&lt;br&gt;b. Press key to get into READY mode (if the step motor is moving).&lt;br&gt;c. Replace SGE-TFRC.&lt;br&gt;d. Replace Key panel.</td>
</tr>
<tr>
<td>7</td>
<td>Power ON, but STEP MOTOR not moving to the home position, and READY LED not lit, cannot edit parameters.</td>
<td>a. Press key to get into READY mode.&lt;br&gt;b. Replace HOME SENSOR.&lt;br&gt;c. Replace SGE-CT02/SGE-CT02E.</td>
</tr>
<tr>
<td>8</td>
<td>Power ON, but STEP MOTOR cannot stop moving, and READY LED not lit, cannot edit parameters.</td>
<td>a. Press key to stop the step motor and get into READY mode.&lt;br&gt;b. Check the parameter (S.Point) setting value of START PROCESS.&lt;br&gt;c. Replace HOME SENSOR.</td>
</tr>
<tr>
<td>9</td>
<td>DC motor or stepping motor cannot work.</td>
<td>a. Check wire connections between SGE-CT02/SGE-CT02E and SGE-TFRC. [b. Replace SGE-CT02/SGE-CT02E. ]</td>
</tr>
<tr>
<td>10</td>
<td>Display shows Err-0, then reset, and get into READY mode.</td>
<td>a. Replace SGE-TFRC.</td>
</tr>
<tr>
<td>11</td>
<td>Display shows Err-1, then reset, and get into READY mode.</td>
<td>a. Check winding parameters S.POINT and BREADTH setting value.&lt;br&gt;b. Check configurations TRAVEL LIMIT setting value.</td>
</tr>
<tr>
<td>12</td>
<td>Display shows Err-3, then reset, and get into READY mode.</td>
<td>a. Check winding parameters S.POINT and BREADTH setting value.&lt;br&gt;b. Replace HOME SENSOR.</td>
</tr>
<tr>
<td>13</td>
<td>Display shows Err-5.</td>
<td>a. Check wire connections between SGE-TFRC and RS-485 connector&lt;br&gt;b. Check wire connections between two stations.</td>
</tr>
<tr>
<td>14</td>
<td>Display shows Err-6</td>
<td>a. Check guiding travel speed.&lt;br&gt;b. Check transformer winding stepper motor speed.</td>
</tr>
<tr>
<td>15</td>
<td>Brake failure.</td>
<td>a. Replace brake.&lt;br&gt;b. Replace SGE-CT02/SGE-CT02E.</td>
</tr>
<tr>
<td>16</td>
<td>Winding spindle can not switching winding direction.</td>
<td>a. Replace RELAY on SGE-CT02.&lt;br&gt;b. Replace SGE-CT02/SGE-CT02E.</td>
</tr>
<tr>
<td>17</td>
<td>Counting failure.</td>
<td>a. Replace turns sensor and check turns cable.&lt;br&gt;b. Replace SGE-TFRC.</td>
</tr>
</tbody>
</table>
14. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>CNC-07SG</th>
<th>CNC-07SGE1</th>
<th>CNC-07SGE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control system</td>
<td>Microcontroller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboard</td>
<td>33 keys key pad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>13 digits 7-segment display, 27 LED lamps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program Memory/Data Memory</td>
<td>E²PROM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>RS-485 interface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winding Parameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.POINT</td>
<td>0.01~999.99mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BREADTH</td>
<td>0.01~999.99mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIRE DIA</td>
<td>0.001~9.999mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TURNS</td>
<td>0.1<del>9999.9turns/1</del>99999turns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.START</td>
<td>0.1~999.9turns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.STOP</td>
<td>0.1~999.9turns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.S.</td>
<td>1~99%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.S.</td>
<td>1~99%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SETTING</td>
<td>Special occasions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td>FEED DIR, WIND DIR, LENG TURNS, AUTO HOME, AUTO START</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winding Spindle shaft</td>
<td>Output</td>
<td>0.5 HP DC motor drive with CW/CCW control</td>
<td>RUN, HI/LOW, SPEED</td>
</tr>
<tr>
<td>Counting</td>
<td>A,B,C, 3 phase, with Absolute/Relative counting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braking</td>
<td>DC24V/12W brake control output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guiding Traverse</td>
<td>Output</td>
<td>2 phase 5V 1A stepping motor drive</td>
<td>PUS, DIR output</td>
</tr>
<tr>
<td>Unit</td>
<td>Configurable in mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input function</td>
<td>RESET STOP START</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output signal</td>
<td>RESET STOP START lamp control(DC24V 0.1A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUX I/O</td>
<td>2 input (For Guiding traverse forward and reverse move manually)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC Power</td>
<td>AC 110V/220V/(50/60 Hz, 700VA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>10°C~50°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension</td>
<td>273(W) ×245(D)× 112(H)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>3.5kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. DIMENSIONS

CNC-07SG/CNC-07SGE1/CNC-07SGE2

TURN SENSOR

COUNTING DISC

HOME SENSOR