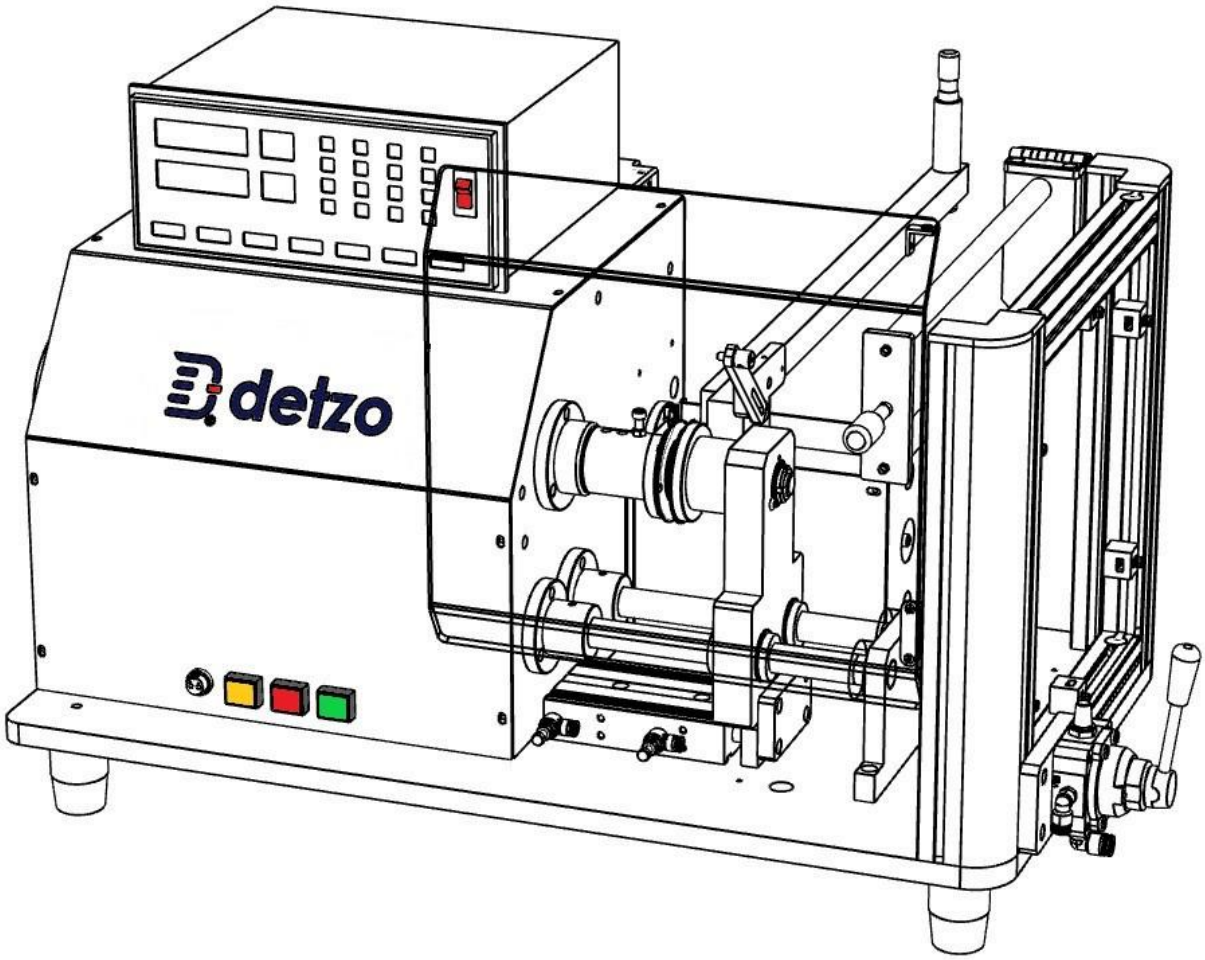
DSW-C03HD

Benchtop Single Spindle CNC Winding Machine

Operation manual



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Description

The DETZO winding machine is a highly reliable, computer-controlled industrial system, housed within a durable and robust structure. It is engineered to support the production of a wide variety of wound components with maximum flexibility.
The machine's operating cycles can be easily modified, saved, and recalled, ensuring consistent repeatability and precise positioning for every operation.
DETZO machines are meticulously designed to meet the highest safety standards and are fully compliant with CE certification, ensuring safe and dependable operation in industrial environments.

Warnings

It is essential to read this manual carefully before proceeding with the installation, operation, or maintenance of the machine. Failure to do so may result in equipment damage or personal injury.

General Warnings

Follow all instructions in this manual for the installation, operation, and maintenance of the machine.
DETZO shall not be held liable for any damage resulting from procedures not explicitly described in this manual, or from partial or complete disregard of the recommended guidelines.
If there is any indication that the machine’s safety integrity has been compromised, it must be immediately taken out of service and secured against accidental use. Only authorized service personnel should perform inspections or repairs.

The safety level is considered compromised under the following conditions:

- The machine exhibits visible signs of wear, particularly on components that ensure safety (e.g., enclosures, gaskets, cable glands, mounting screws, etc.).
- Grounding connections are found to be non-compliant.
- The machine has sustained mechanical or electrical stress (e.g., shocks, impacts, etc.).
- The machine fails to operate under normal conditions (refer to the operation manual for troubleshooting).
- The machine has been stored for an extended period under unsuitable environmental conditions.
- The machine experienced severe stress during transportation.
- The interior of the machine has been exposed to liquids.

Always handle the machine carefully and avoid applying excessive force during installation, operation, or maintenance.

General Recommendations

- Each section of this manual includes specific safety instructions designed to minimize risks associated with the described operations. These instructions are marked with the appropriate safety symbol. It is essential to follow all directions provided in this manual. Additionally, comply with general safety regulations applicable to industrial environments. In cases where there is a discrepancy between this manual and existing local safety regulations, the more stringent requirements must be followed.
- Do not remove or modify any of the safety devices installed on the equipment under any circumstances.
- Never interact with moving parts. If intervention is unavoidable, first press the EMERGENCY STOP button, confirm that the machine has completely stopped, and ensure there are no hazardous conditions in the area before proceeding.
- Do not perform any operation not covered in this manual or not formally explained during the official training. For any unclear procedures, or if information is missing from this manual, contact the manufacturer before attempting any action that could impact the equipment.
- During machine operation, certain components are supplied with AC 220V power, including areas accessible for inspection.
- **WARNING: CONTACT WITH ELECTRICAL VOLTAGE AND CURRENT CAN BE FATAL!**

Warning: Despite being equipped with multiple safety protections, the device may still present unforeseen risks that cannot be entirely prevented.

Use Warnings

- To prevent damage caused by lightning, always disconnect the power supply cable during thunderstorms.
- Never disable or bypass the machine's safety features under any circumstances.

Safety Regulations

This machine is designed and constructed in compliance with the following standards and directives:

- EN IEC 60204-1: Safety of machinery – Electrical equipment of machines – Part 1: General requirements
- EN 292-1: Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology and methodology
- EN 292-2: Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications
- EN 294: Safety of machinery – Safety distances to prevent danger zones from being reached by the upper limbs
- EN 349: Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
- EN 418: Safety of machinery – Emergency stop equipment, functional aspects – Principles for design
- EN 775: Manipulating industrial robots – Safety
- 73/23/EEC: Low Voltage Directive

Safety of the Machine

The machine can operate with the safety protection device open; however, when the safety door is opened, immediate insulation is required to ensure the safety of both programmers and operators. During normal operation and program editing, the machine can be stopped by opening the safety door if necessary. In this condition, the machine can be sequentially operated and stopped via the program controller connection. **** Only qualified operators are authorized to operate the program controller. ****

When editing the program using the program controller and opening the safety door, please exercise caution, especially near the rotating shaft mechanism. A failure in the control circuit may lead to unpredictable displacement. "DETZO" disclaims any responsibility for abnormal use or modifications to the program.

Safety Rules

The manufacturer disclaims all responsibility for:

- Material or biological damage, moral injury, or any other type of loss incurred by the user, third parties, structures, or the environment.
- Any action performed on the product or its components that is not explicitly described in this manual, or without prior formal consent from the manufacturer.
- Failure to comply with the standard safety regulations in effect within the working environment.
- Negligence during product transportation and handling.
- Incompetence of personnel or improper use of the product.
- Non-compliance with safety rules and markings during equipment operation and maintenance, even if clearly outlined in the undelivered documents.
- Human error or improper operation of the equipment.

Danger Mark

- Danger signs are clearly marked on the equipment and must never be removed under any circumstances. These signs are also referenced in this manual for easy identification and understanding.
- Please pay close attention to the following symbols as used throughout this manual. They are designed to indicate warnings, important instructions, and safety-related information. Ensure all operations are carried out in accordance with these symbols to prevent accidents and equipment damage.

If this symbol is affixed to the machine, the operator must refer to the corresponding symbol description in the manual to avoid potential damage. These symbols are also displayed throughout the operation manual to highlight warnings, important instructions, safety precautions, equipment operations, and other critical information.

If this mark is affixed to the machine, it indicates the presence of dangerous voltage in that area. Only properly trained and authorized personnel are permitted to work in this zone. When this symbol appears elsewhere, it serves as a warning to remain cautious of high voltage and take appropriate safety measures.

This symbol is displayed on the machine in areas where moving parts are present. Always switch off the main power supply before performing any work in these areas to avoid injury.

This symbol is placed on the machine in areas where rotating parts are present. Always switch off the main power before performing any work in these areas to ensure operator safety.

This symbol indicates areas of the machine that may reach high temperatures. Exercise caution to avoid burns—do not touch these areas without proper protection.

This symbol appears in the manual to highlight important information and related precautions. Please read carefully to ensure correct operation and to prevent potential issues.

This symbol appears in the manual to indicate helpful advice or recommendations. It is intended to assist with efficient and safe operation of the equipment.

This symbol appears in the manual to indicate that a specific tool is required for the procedure. Make sure to prepare and use the appropriate tool as shown to ensure correct and safe operation.

This symbol appears in the manual to indicate that additional information is available. Please refer to the relevant section for further details.

This symbol appears in the manual to indicate that the button shown should be pressed.

CONTENT

A. Safety instruction

"Read this manual thoroughly before installing, operating, or performing any maintenance on the machine."
"Observe all safety precautions before operating the machine to prevent personal injury and equipment damage."

A1 Safety rule

(Including operation, tooling, environmental condition & operator's consideration):

A1.1 Precaution of safety operation

(1) The operator must be a trained technician who is thoroughly familiar with the contents of this operation manual.
(2) The machine must only be operated after the safety instructions have been read and fully understood.
(3) The operator must be aware of the machine's behavior and responses upon startup.
(4) The operator must know how to perform an emergency stop before starting the machine.
(5) Operators and maintenance personnel must maintain clear communication while the machine is in operation.
(6) Operators are not allowed to wear gloves while operating the machine.
(7) Operators with long hair must wear appropriate hair coverings, such as hair nets or hats, to prevent entanglement.
(8) To reduce the risk of injury, the equipment is equipped with protective devices, safety features, and warning labels. However, potential mechanical hazards may still exist. All operators, maintenance personnel, and bystanders must be aware of these dangers and strictly follow all safety instructions.
(9) When more than one person is involved in operating the machine, a designated person must be appointed to give commands and maintain control. Only this individual is permitted to operate the machine.
(10) Always observe and follow the safety considerations listed above during machine operation.

A1.2 Operating personnel

Three distinct categories of personnel involved in operating the machine have been identified:

(1) **Maintenance operator** – The maintenance operator is responsible for inspecting and assessing the condition of the machine's components. To ensure safety during maintenance procedures, all tasks must be performed with the electrical and pneumatic power sources disconnected or with the system completely powered down.
(2) **Programmer** – The operator in charge of programming the machine must have a comprehensive understanding of all its functions and must have received proper training from DETZO to ensure safe and accurate operation.
(3) **Machine operator** – The operator responsible for the machine's daily production must work in a safe environment and be fully aware of the potential hazards associated with operating the machine.

A1.3 Precaution for machine operator

(1) The machine must be installed in a properly and safely secure location.
(2) Confirm that all protective devices are in the correct position before starting.
(3) The machine must be maintenance or lubricated in a stopped state.
(4) When the machine is out of the limit, the machine is not allowed to work.

A1.4 The condition of operator & maintenance staff

(1) Only qualified technicians can operate the machine and understand how to operate correctly, untrained people are not allowed to operate the machine.
(2) Only certified technicians can perform electrical and electronic control repairs.

A1.5 Environmental status

It is strictly forbidden to place the machine in a potentially explosive environment. Generally, the machine needs to be installed under the following conditions:

(1) In an environment with an ambient temperature of +30°C ~ +10°C, there is no excessive dust, acid gas, corrosive gas and salt. It is best to be in an air-conditioned room.
(2) The average temperature cannot exceed 35°C in the course of 24 hours.
(3) Avoid abnormal shaking and avoid placing the machine in a location that may be exposed to direct sunlight or near a heat source.
(4) Humidity: 30 ~ 95% *(No moisture condensation).*
(5) The relative humidity cannot exceed 40 °C at 50%, and the relative humidity cannot exceed 20 °C at 90%.
(6) Phase frequency: 50 / 60Hz ±1%.
(7) Rated voltage: 1 Ø 110V AC ±10 %.
(8) An earth lead wire (Yellow / Green) should make sure of connecting to ground.
(9) Keep the environment in good condition, avoid the floor being damaged, slippery...etc.

A1.6 Directions for installation and use of the Equipment

(1) The equipment is power supplied, avoid installing the equipment in rooms where liquid splashes may be inadvertently sprinkled out or condensate develop.
(2) During the operation, the equipment may generate electric discharge or sparks, avoid installing the equipment in the rooms where inflammable vapors are present or may develop.
(3) Keep the working areas clean and free from things that could be an obstacle to or endanger the operator, in particular at the inspection post.
(4) Only after the machine is completely installed (refer to the “mechanism” chapter for the installation of the mechanism), the power can be supplied.
(5) Before connecting the equipment, make sure the flow delivered from pneumatic or power source are corresponding to the preset values.
(6) Before powering up the system, check safety devices are sound and make sure that no anomalous condition is actual.

A1.7 Residual risks

(1) Before connecting the machine to the power supply, ensure that the power supply voltage corresponds to that indicated on the plate affixed to the machine.
(2) It is the user's responsibility to verify that the power supply complies with the specified values and current regulations.

A1.8 Installation warnings

(1) Choose the installation location correctly.
(2) This machine contains electrical and electronic components. Do not install in an explosive environment or in contact with flammable materials. May cause a fire.
(3) Do not use water or foam when the machine is powered on to avoid fire
(4) After installation the machine should be stable, and not subject to vibration or accidental movement.
(5) All connecting cables should be properly fastened down, in order to avoid knocks and accidental damage and to obtain optimum performance.
(6) The operator must be able to access the controls of the machine easily, without running personal risks.
(7) The machine must be connected to a power supply circuit fitted with a switch or other device which allows the power to be cut off.
(8) If the machine is powered by an external transformer to regulate the voltage, ensure that the common terminal of the transformer is connected to the neutral point of the power circuit.
(9) If the cable length is too long, do not cut the cable. It should be safe to place the excess.

A1.9 Unpack

When receiving the equipment, wooden boxes have any damage to the transport company immediately. When unpacking, take care not to damage the device, remove the protective film, and then move the device from the pallet.

A1.10 Stability and limit vibrations

DETZO benchtop winding machines have a design that ensures the stability of the machine. It is only necessary to place the machine on a level surface.

A1.11 Packages removal

The machine is wrapped in protective film for transport. Mechanisms that may have shifted during transportation are secured to the machine using red locking cable ties.

A1.12 Electrical connection

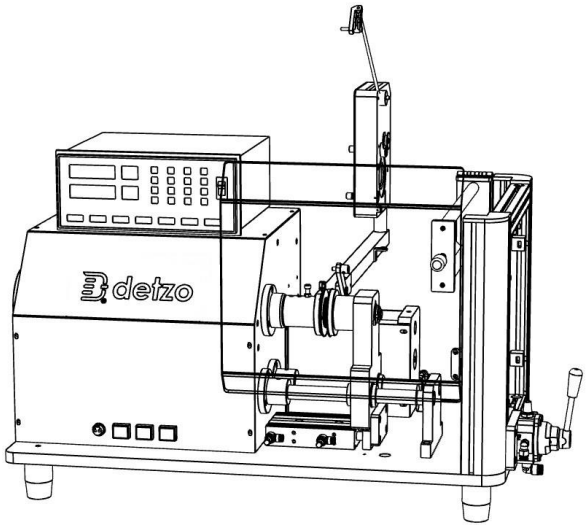
Inside the winding machine, a lot of active parts are subjected to a voltage of **110Volts** (A.C.). Sometimes incoming power must be converted by a transformer. The electrical connection has to be done by allowed and skilled personnel.

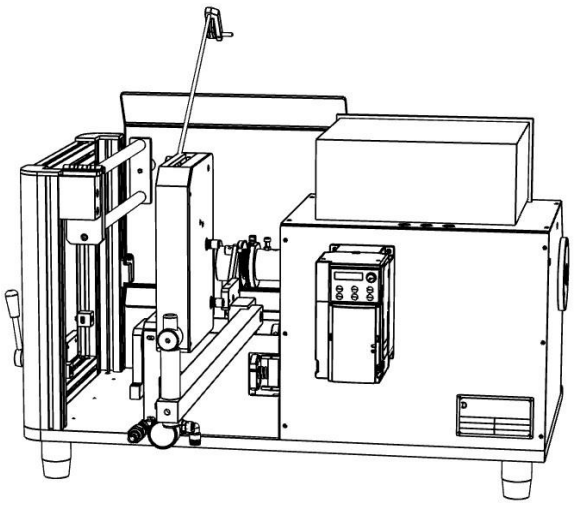
Verify that the wires used for electrical connections are the same size or larger than the cables that are located immediately below the junction box. The customer shall provide a safe power-off device.

A1.13 Pneumatic connection

The pneumatic system operates with self-lubricating seals; therefore, lubricated air is not required and may even damage the components. It is essential to supply clean, dry air free from moisture and particles. The required air pressure range is 0.4 – 0.6 MPa.

A1.14 Installation completed diagram





✧ **Size and Specifications**

No. of Spindle	Single Spindle
Applicable Wire dia.	Ø0.03~Ø1.50mm
Winding Range	1~60mm
Bobbin Diagonal (MAX.)	100mm
Spindle Speed (MAX.)	6920rpm (CW / CCW)
Power supply	1Φ 110Vac / 220Vac
Rated frequency	50~60Hz ±1%
Poewr Consumption	1KW
Dimensions	1100(L) x 825(W) x 460(H) mm
Machine Weight	140kg±10

A1.15 Try running

(1) The tooling made and edit program accord to products spec.

(2) Second, the installation of the machine is completed, you need to determine whether the ground is good, and start the power switch. At this point, the machine will automatically reset, when the reset is complete, press the start switch.

(3) If there is no more questions in try running, it can start to produce it.

✧ **Notice: If machine get failure, it may be wrong in program or material spec. is different, pls. consult with DETZO or agent.**

A2 Machine expect using

This winding machine is designed for manufacturing the coil products. The wire diameter of the copper wire is used between 0.03 to 1.50mm. Pls. don't use other kind of wire. Please refer to the other chapter of the Operation Manual for details of operation, maintenance, adjustment, program editing etc.

B. Machine maintenance

To keep your machine running at peak performance, we strongly recommend following the scheduled maintenance intervals. Many key components experience regular wear and tear and will need to be inspected, adjusted, or replaced over time. That's why we've outlined a clear maintenance timeline for your reference. For any work involving parts that aren't typically subject to wear, please treat it as a special procedure. In these cases, we recommend reaching out to the Detzo Service Department for expert support.

B1 Daily checking

(1) To check power supply.
(2) To check tooling in correct position.
(3) Check that the air pressure source is stable and within the required range.
(4) Confirm the correct program type is selected prior to starting production.
(5) Material arrangement: Copper wire, Bobbin, Tape…etc.
(6) Check that the wire threading path through the tensioner is correct.

B2 Weekly checking

(1) To check tooling life condition.
(2) To check nozzle life and check if there any dust in side nozzle.
(3) Examine the cylinders of each mechanism to ensure proper operation, and verify the status of all sensors.
(4) Ensure there is no water accumulation in the air supply pipe.
(5) Clean the cooling fan to maintain proper ventilation and avoid overheating.
(6) Check the usage status of the Tension rod / Felt / Guide wheel / Eyelet / Tension wheel / Tension sensor.

B3 Monthly checking

(1) Clean the interior of the machine and the electrical control box.
(2) Lubricate the ball screw, linear slide rails, and hard chrome rods with appropriate grease.
(3) Inspect the condition of the electrical modules and each motor to ensure proper operation.
(4) Examine the condition of all axis belts for signs of wear, looseness, or damage. Replace if necessary.

B4 Greasing operations

(1) Composition of Fluids Used for Maintenance Operations:

a. *The following list includes the commonly used grease, lubricants, and degreasing fluids for Detzo machine maintenance, along with their recommended applications.*

b. *For more detailed information, please refer to the product specifications provided by the manufacturer.*

(2) Greasing Sliding Guides and Ball Recirculation Screws:

For the lubrication of linear guides and ball screws, we recommend using Lithium Soap Base Grease (NLGI No. 2). We particularly suggest BECHEM (Hagen), Germany's BERULUB FR16, which is highly suitable for this application. The composition and technical data of this grease are as follows:

Table 1: BERULUB FR16 Grease Technical Data

Characteristic	Value	Test Method / Notes
Service Temperature Range	-50°C to +140°C (-58°F to +284°F)	
Thickener	Special lithium soap	
Drop Point	≥ 190°C	IP 396
Worked Penetration (1/10 mm)	265 ~ 295	DIN ISO 2137
Water Resistance (mmH_2O)	1–90	DIN 51 807 P1
Corrosion Test on Copper (24h/100°C)	1a (no corrosion)	DIN 51 811
Oxidation Stability (100h/99°C)	0.2 bar	DIN 51 808
Flow Pressure	+20°C: 120 mbar / -35°C: 450 mbar	DIN 51 805
Base Oil	Synthetic oil / Polyalphaolefin (PAO)	
Kinematic Viscosity at 40°C	Ca. 32 mm²/s	DIN 51 562
Kinematic Viscosity at 100°C	Ca. 6 mm²/s	DIN 51 562

(3) Suitable grease:

Other lithium soap-based greases can also be used, as shown in Table 2:

Table 2: Types of Suitable Grease

Brand	Type
Shell	Alvania grease 2
Mobil	Mob ilex 2
Texaco	Multifak 2
Aral	Aralub 2
BP	Energrease 2
Esso	Beacom 2

How to use:

1. After cleaning off old grease and accumulated dirt with a brush, apply a thin and even layer of fresh grease to the guides.

2. Fill the grease injector with an appropriate amount of grease, then inject it through the nipples—nipples are provided on both the worm screw and the slider.

Note: *Avoid overfilling with grease. Excess grease may increase friction in moving components, damage washers, and impair overall machine performance.*

(4) Lubrication:

It is recommended to use Turbine Oil (Class 1, ISO VG32) to lubricate worm screws and guides. This oil is suitable for machine components, providing effective protection against rust and corrosion, and preventing stick-slip on the guides.

(5) Suitable oils:

Most leading brands offer this type of lubricant.

How to use:

Clean the parts before applying grease or oil directly onto the parts to be lubricated.

(6) If the machine is planned to be out of operation for an extended period, apply a thin layer of grease (butter) on parts prone to rust, such as worm screws, bearings, and sliders, to prevent corrosion.

B5 Drive belts check

To ensure stable equipment performance, the condition and tension of the transmission belt should be inspected regularly. It is recommended to perform this inspection at least every 500 operating hours to determine if tension adjustment or belt replacement is required.

(1) Wear condition check

a. *Check each belt to ensure it is in good condition, with no cracks, fraying, hardening, or other signs of abnormal wear.*

b. *If any defects or belt breakage are found, the belt must be replaced immediately to prevent serious damage to mechanical components.*

(2) Belt Tension Inspection

a. *Each belt is typically equipped with one or more tension pulleys to compensate for gradual loss of tension over time.*

b. *Follow these steps to adjust the belt tension:*

I. Loosen the mounting screws of the belt tension pulley.

II. Reposition the pulley to eliminate belt slack, then tighten the screws securely.

(3) Installation Guidelines

a. *Power Off Safety: Always switch off the power before installation. Loosen the motor mounting bolts and shift the motor to slacken the belt for easy removal. Do not forcibly pry off the belt.*

b. *If the pulley center distance is adjustable, shorten it before installing the belt. After installation, restore the original center distance.*

c. *If a tension pulley is present, loosen it before installing the belt and adjust it after installation.*

d. *Inspect the old belt for signs of unusual wear—it may indicate design flaws or poor maintenance. When installing a new belt, avoid excessive force or using sharp tools, as this can cause undetectable damage to the tensile layer.*

e. *If the structure does not allow separate installation, install the belt and pulley onto the shaft together.*

f. *Clean belts and pulleys by wiping with a cloth moistened with a non-volatile solvent. Do not soak or scrub the belt.*

g. *Belts must remain dry and clean prior to installation. Do not use sandpaper or sharp tools to scrape off dirt or grease, as this may damage the belt surface.*

(4) Wear Condition Descriptions

Symptom	Possible Cause	Recommended Action
The belt breaks without prior signs of fatigue	Excessive bending during handling.	Properly store and handle the belt.
	Forced installation.	Loosen the tensioner or pulley before installing.
	Severe pulley misalignment.	Realign the pulleys.
Side wear or damage on the belt	Improper pulley alignment.	Align the pulleys.
Belt tracking deviation	Severely misaligned pulleys.	Recalibrate pulley alignment.
Belt hardens and cracks	Excessive ambient temperature (>90°C).	Improve environment or use heat-resistant belts.
Damaged belt teeth	Insufficient tension causing tooth skipping.	Adjust belt tension appropriately.
Longitudinal tear	Misaligned pulley causing edge friction.	Correct pulley position and alignment.
Rubber swelling	Heavy oil contamination.	Keep belts clean and oil-free.
Metallic noise	Excessive belt tension.	Set appropriate initial tension.
Excessive wear on belt surface fabric	Over-tightened belt.	Readjust the tension.
Pulley tooth wear	Excessive tension.	Set correct belt tension.

(References Data Source: www.wdf-belt.com.tw)

(5) General Wear Diagnosis

Phenomenon	Possible Causes
Belt damage due to excessive tension	Excess tension can shear or crack belt teeth. Cracks may propagate along cords and cause tooth loss.
Tooth skipping due to low tension	Insufficient tension allows the belt to skip teeth, reducing engagement and causing vibration.
Pulley misalignment	If the belt is compressed between misaligned pulley flanges, it may suffer side wear or cracking.
Foreign object intrusion	Debris damages teeth and cords internally, weakening belt strength significantly.
Thermal degradation	Prolonged high temperature exposure hardens rubber, leading to surface and internal cracking.

(References Data Source: www.wdf-belt.com.tw)

B6 Risks and Precautions

(1) Appropriate risk prevention measures must be taken during maintenance operations.
(2) DETZO assumes no responsibility for consequences resulting from unauthorized modifications or failure to follow standard safety procedures.
(3) Maintenance should be performed at variable intervals based on the actual usage of the machine.
(4) The frequency of maintenance should be determined according to the machine's daily operating hours.
(5) It is recommended to allow at least a minimal interval between each operation for inspection. If the machine is found to be in good condition and does not require immediate maintenance, the inspection interval may be appropriately extended.

B7 Machine Maintenance Precautions

(1) **Power Safety**: Never perform maintenance or repairs while the machine is powered. Always disconnect the power before any maintenance, cleaning, or relocation. Unplug by hand—never pull the cable.
(2) **Cleaning Instructions**: Do not use liquid detergents or chemical cleaners. Use a slightly damp, non-abrasive cloth for cleaning.
(3) **Replacement Parts**: Only use genuine replacement parts for any damaged components.
(4) **Trained Personnel**: Maintenance must be carried out by trained personnel familiar with potential risks and procedures, following the guidelines in the "Machine Maintenance" section.
(5) **Power Isolation**: The power supply must be completely isolated before performing any maintenance or repair work. Never perform operations while the machine is still powered on.
(6) **Authorized Personnel**: Only individuals who have received formal equipment training are authorized to perform maintenance.
(7) **Professional Support**: Always contact a DETZO-certified technician for maintenance. Please refer to the "Machine Maintenance" section before contacting the DETZO service center.

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✧ Periodic Maintenance Schedule

To ensure optimal performance and prevent unexpected breakdowns, maintenance must be performed regularly based on actual usage hours and operating conditions.

	Project	Boot	Daily	Weekly	Monthly	Quarterly
1	Verify winding tooling position and production model	●	●			
2	Check power supply	●	●			
3	Check air supply	●	●			
4	Inspect pressure gauge assembly for water accumulation	●	●			
5	Confirm program type before production	●	●			
6	Verify tensioner (wire feeder) specifications and tension	●	●			
7	Check for bobbin residue on winding tooling or load/unload bar	●	●			
8	Inspect all screws for looseness	●			●	
9	Inspect condition of winding tooling			●		
10	Check cylinder condition for all mechanisms			●		
11	Inspect sensors for proper function			●		
12	Check condition of nozzle			●		
13	Check ceramic wheels			●		
14	Lubricate ball screws and slide rails as needed				●	●
15	Clean inside of the machine and electrical box (ensure power is off)					●
16	Inspect electrical modules and motors (by qualified personnel)					●
17	Check condition of axis belts (by qualified personnel)					●
18						
19						
20						

All procedures should be performed by trained personnel in accordance with the maintenance instructions provided in this manual.

C. Nozzle specification

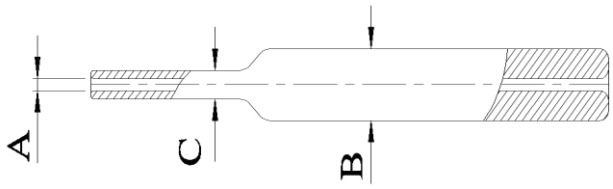
One set of nozzle is supplied with the machine *(same quantity as number of spindles)* as standard accessory, user can purchase additional if necessary according to below table:

Unit: mm

NO.	Model No.	I.D.(A)	Total Length	O.D.(B)	O.D.(C)
1	ST05030-2-12	0.5	30	2.0	1.2
2	ST05030-3-21	0.5	30	3.0	2.1
3	WA03030-3-06	0.3	30	3.0	0.6
4	WA03030-3-08	0.3	30	3.0	0.8
5	WA03030-3-10	0.3	30	3.0	1.0
6	WA05030-3-12	0.5	30	3.0	2.0
7	WA08030-3-20	0.8	30	3.0	3.0
8	WA08030-3-30	0.8	30	3.0	3.0
9	WA15030-3-30	1.5	30	3.0	3.0
10	WS05030-2-10	0.5	30	2.0	1.0
11	WS10030-3-30	1.0	30	3.0	3.0
12	WT03030-4-10	0.3	30	4.0	1.0
13	WT05030-4-12	0.5	30	4.0	1.2
14	WT15030-4-20	1.5	30	4.0	2.0
15	AA27035-5-50	2.7	35	5.0	5.0
16	RA05030-3-12	0.5	30	3.0	1.2

Wire diameter x 3 ≤ Nozzle inner diameter (A)

S ..... High-carbon steel
W ..... Tungsten steel
R ..... Ruby *(at wire outlet only)*
A ..... Ceramic *(at wire inlet and outlet)*



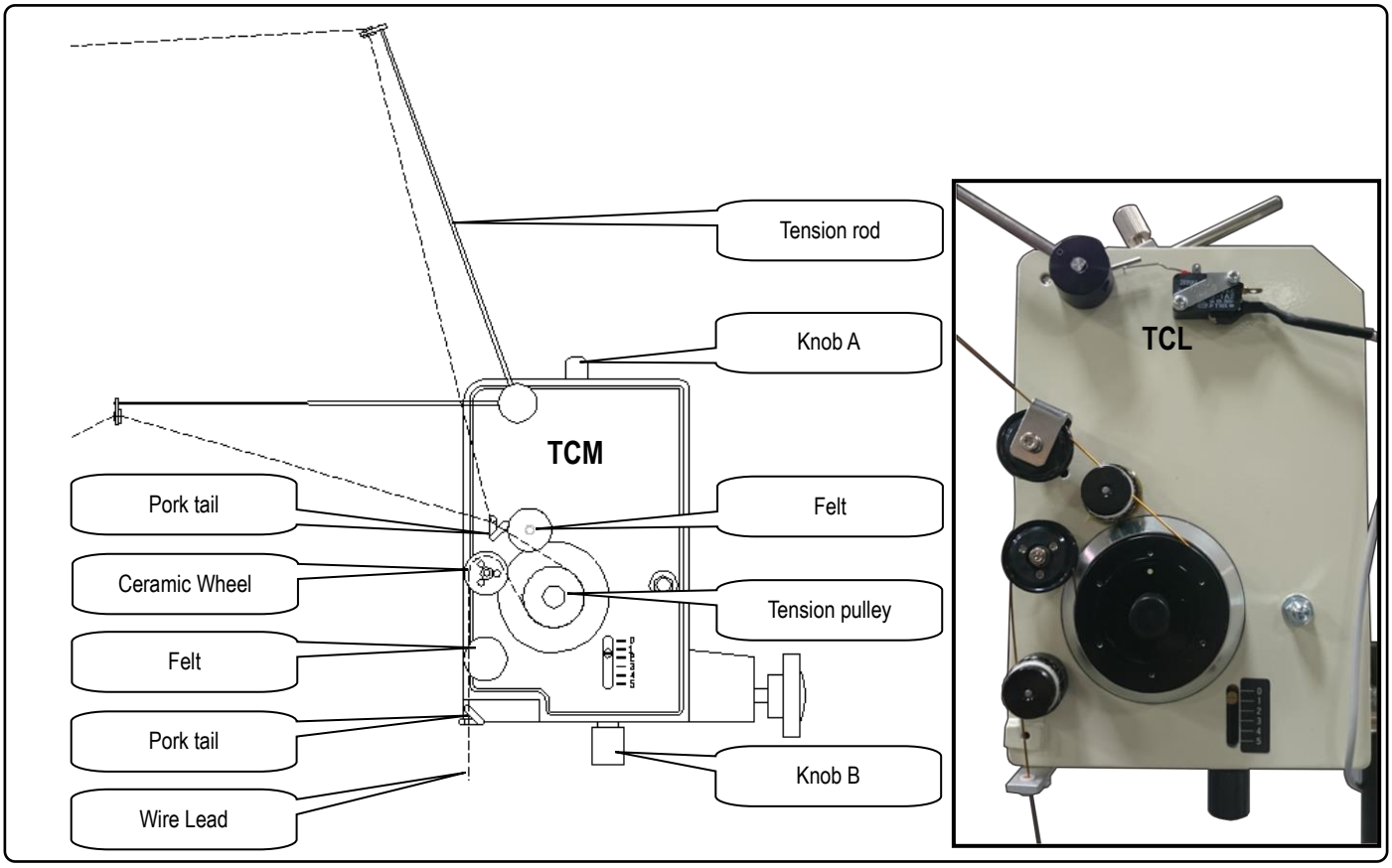
WT (Material) **05** (A) **030** (Total Length) - **3** (B) - **12** (C)

- ✧ In normal condition, winding programs are ready with the machine if customer provide all necessary winding specification in advance; but to prevent any unexpected damage caused by transportation which might affect machine performances, we strongly recommend that simulative nozzles should be used instead of normal nozzle in the very first time for pilot run, replace normal nozzles when it is sure that machine is in normal condition.
- ✧ When writing a new program, before completing the test run, it is also recommended to use a fake nozzle instead of the standard nozzle.

D. Tensioner

Proper maintenance and operation of the tensioner help ensure more stable and consistent production output.

D1 Description



According above drawing for wire threading

1. Tensioner Model

	Model	Wire Dia. Range
Mechanical	DSW-TC3S	Φ0.03~Φ0.04
	DSW-TCSS	Φ0.04~Φ0.06
	DSW-TCS	Φ0.05~Φ0.08
	DSW-TCM	Φ0.07~Φ0.14
	DSW-TCL	Φ0.15~Φ0.50
	DSW-TCLL	Φ0.50~Φ1.00

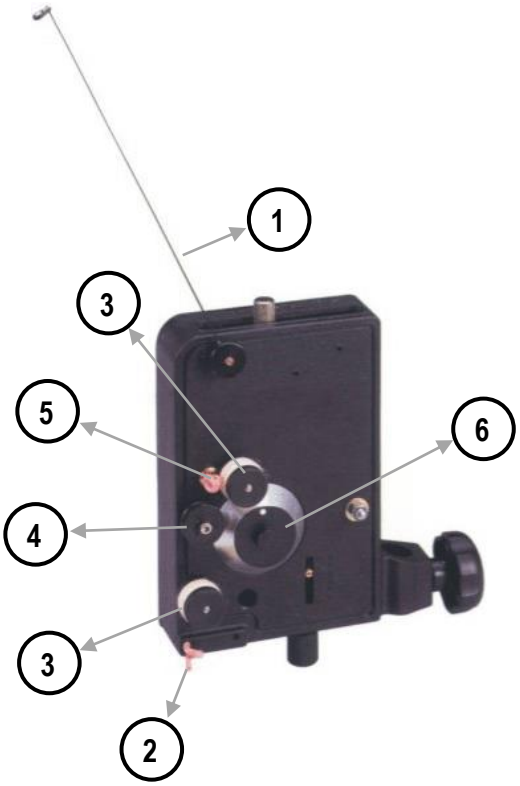
	Model	Wire Dia. Range
Electronic	DSW-TSM	Φ0.015~Φ0.12
	DSW-SSM	Φ0.010~Φ0.12

2. Ordering Information

1. Tensioner Rod	
Model	Part No.
DSW-TC3S	B-EDP-S009
DSW-TCSS	B-EDP-S011
DSW-TCM	B-EDP-S010
DSW-TCL	B-EDP-S015
DSW-TCLL	B-EDP-S017

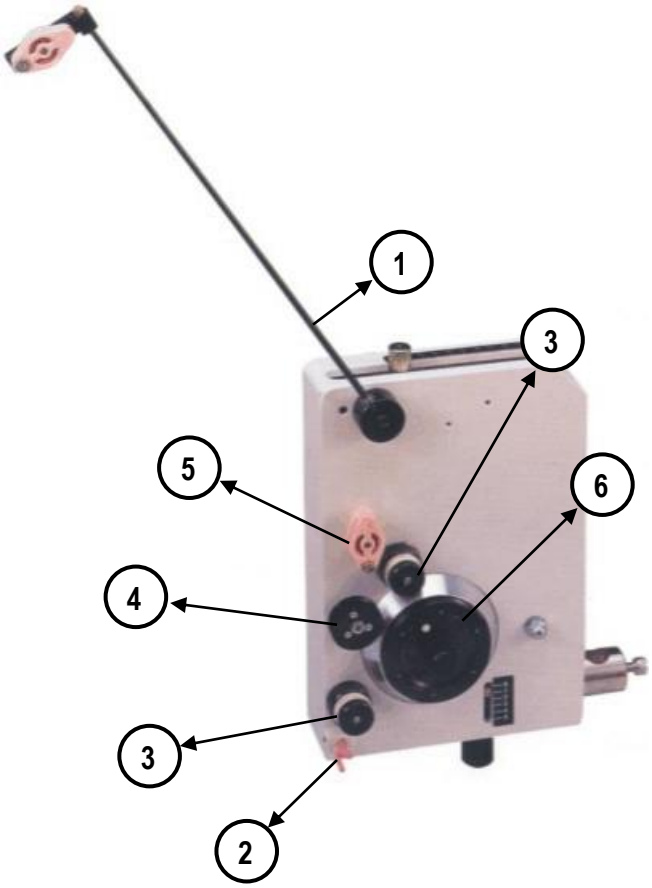
2. Pork tail (Inlet)	
Model	Part No.
DSW-TC3S	K-33027-LO-S
DSW-TCSS	K-33027-LO-S
DSW-TCM	K-33027-LO-S
DSW-TCL	K-33232-LO-S
DSW-TCLL	K-33232-LO-S

3. Felt	
Model	Part No.
DSW-TC3S	FLE-01
DSW-TCSS	FLE-01
DSW-TCM	FLE-01
DSW-TCL	FLE-04
DSW-TCLL	FLE-04



4. Ceramic Wheel	
Model	Part No.
DSW-TC3S	K-J5317320-683
DSW-TCSS	K-J5317320-683
DSW-TCM	K-J5317320-683
DSW-TCL	K-J5322428-694
DSW-TCLL	K-J5322428-694

5. Pork tail (Outlet)	
Model	Part No.
DSW-TC3S	K-33027-LO-A00
DSW-TCSS	K-33027-LO-A00
DSW-TCM	K-33027-LO-A00
DSW-TCL	K-NT003SF
DSW-TCLL	K-NT003SF



6. Tension Pulley	
Model	Part No.
DSW-TC3S	B-EDP-S008
DSW-TCSS	B-EDP-S007
DSW-TCM	B-EDP-S006
DSW-TCL	B-EDP-S016
DSW-TCLL	B-EDP-S039

3. Tension adjusting

(1) Pull the copper wire down by hand and adjust knob A to bring the tension rod closer to the horizontal angle.

(2) Adjust knob B to a close tension value.

(3) Check the tension with a tension meter during winding.

(4) Adjust knob B to obtain proper tension (clockwise-the tension value increases; counterclockwise-the tension value decreases).

(5) If there is a big difference between the tension and the set value, the operator can adjust knob A again.

4. Warning

(1) Don't thread copper wire through tension pulley more than 1 turn.

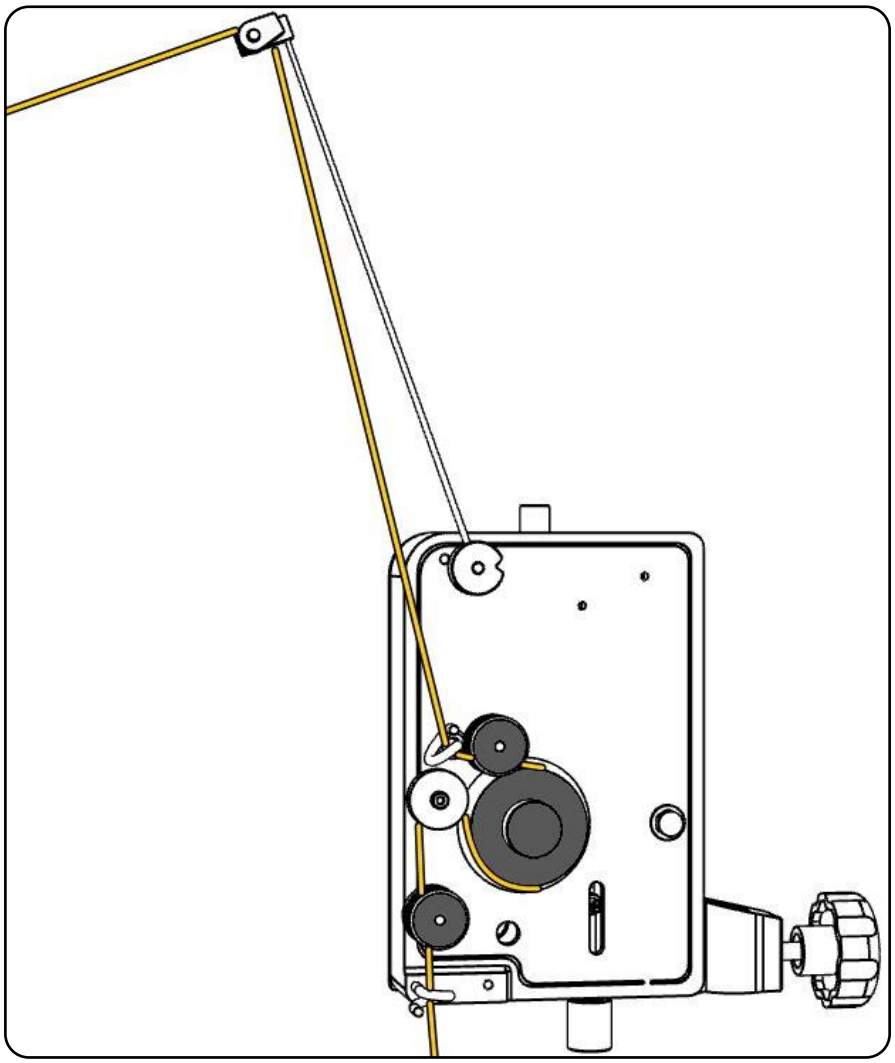
(2) Please clean the felt regularly or replace it when it becomes dirty.

(3) Never impact tension pulley.

5. Maintenance

After a period of use, grease and dust will adhere to the felt. It is strongly recommended to clean the felt with alcohol at least once a week; when soiling cannot be removed, replace the felt.

6. Thread the wire



After threading the copper wire, pull the copper wire by hand to test whether the feeding process of the tensioner is smooth.

D2 How to clean tensioner

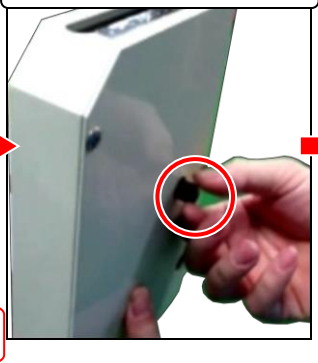
(The image is for illustrative purposes only and may not depict the exact equipment.)

Alcohol, Syringe
Sewing needle
Air gun

When using an air gun, please note that the air volume needs to be weakened and should not be too large.

1. Appliance of clean.

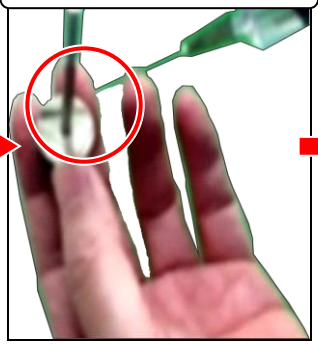
2. Remove the nut of roller.



3. Inject Ethanol on felt.

4. Dry felt by air gun.

5. Inject Ethanol on felt (another side).



6. Dry felt by air gun.

7. Clean the pulley.

8. Adjust the tension to zero level.

9. Inject Ethanol on O-ring.

10. Dry the break by air gun.

11. Lean the dust attached on the O-ring by needle.

12. Inject Ethanol on O-ring.

13. Dry O-ring by air gun.

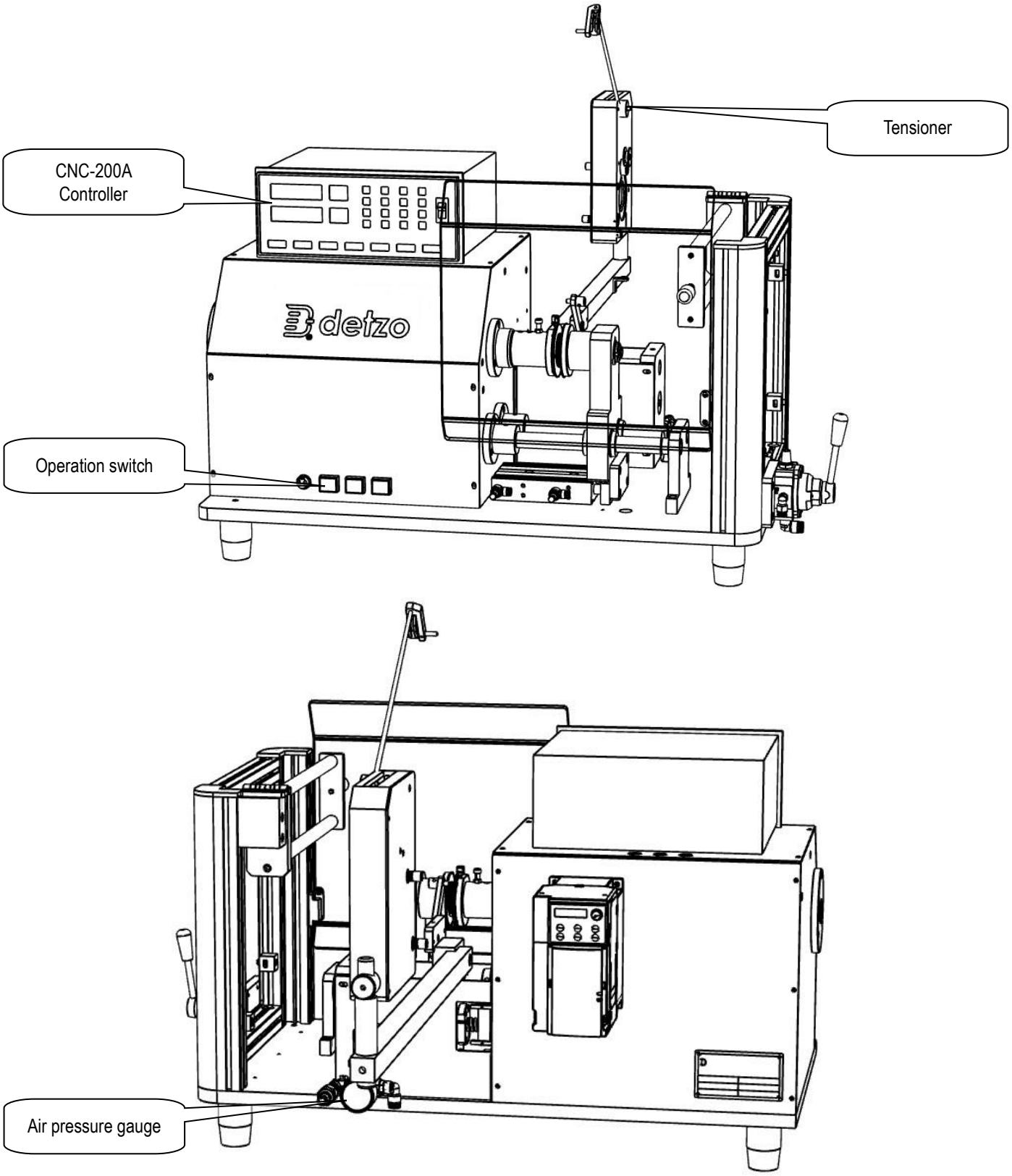
14. Cleaning process are suitable for all kinds of mechanical tensioner.

15. Please clean the felt and tensioner on regular time.

D3 Tension range suggestion table

Guide wire dia. (mm)	Safety tension (gr.)	Max. Tension (gr.)
0.02	3.5	5.0
0.03	9.0	11.0
0.04	13.5	16.1
0.05	20.3	23.2
0.06	29.0	32.0
0.07	40.6	44.2
0.08	50.0	53.8
0.09	62.6	67.0
0.10	78.0	83.0
0.11	93.0	98.4
0.12	108.0	112.3
0.13	125.0	131.8
0.14	143.0	153.0
0.15	161.0	175.5
0.16	181.0	200.0
0.17	203.0	225.4
0.18	225.0	252.7
0.19	248.0	281.6
0.20	272.0	312.0
0.21	298.0	344.0
0.22	323.0	377.5
0.23	350.0	412.6
0.24	380.0	449.3
0.25	410.0	487.5
0.26	438.0	527.3
0.27	470.0	568.6
0.28	505.0	611.5
0.29	535.0	656.0
0.30	565.0	702.0
0.32	635.0	799.0
0.35	746.0	956.0
0.37	820.0	1,070.0
0.40	950.0	1,250.0
0.45	1,160.0	1,580.0
0.50	1,400.0	1,950.0
0.55	1,650.0	2,360.0
0.60	1,930.0	2,810.0
0.65	2,220.0	3,360.0
0.70	2,520.0	3,780.0
0.75	2,830.0	4,400.0

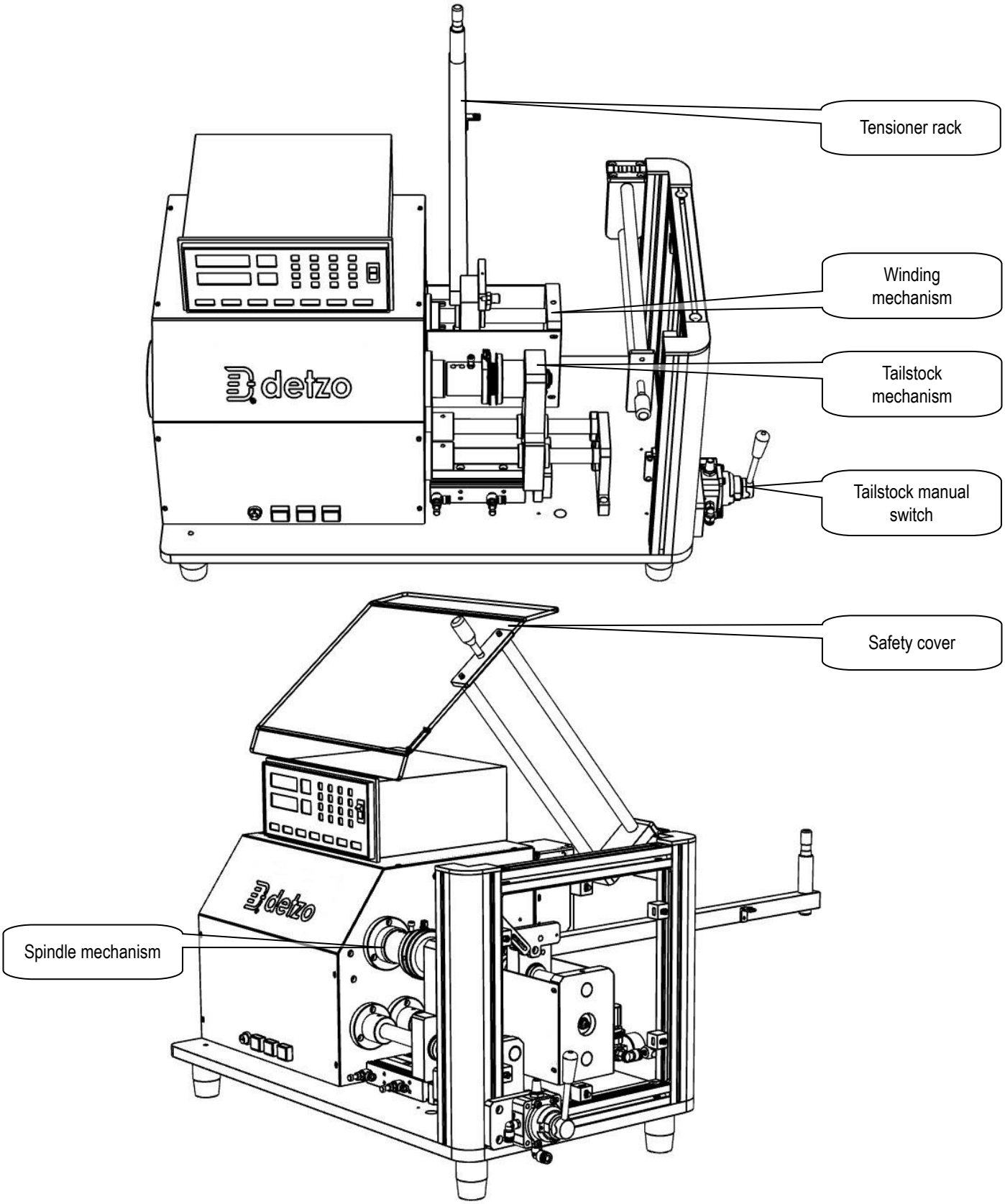
E. Machine description



E1 General function

The **DSW-C03HD** benchtop winding machine is designed for semi-automatic operation. The operator places the bobbin onto the winding fixture and manually activates the tailstock to support and secure the bobbin, ensuring precise control of product dimensions. After winding is completed, the coil is manually removed. This setup delivers accurate, stable, and highly repeatable winding cycles.

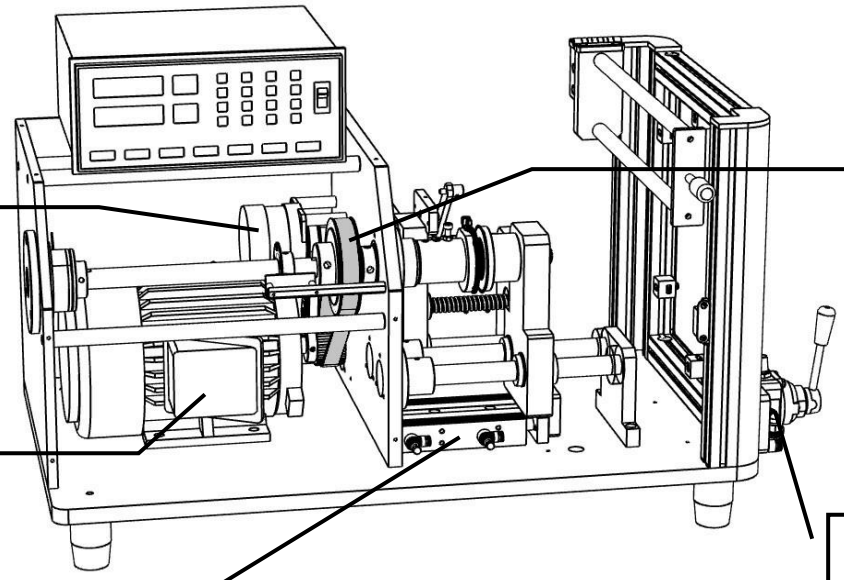
E2 Machine main unit & mechanical name



➢ **DSW-C03HD winder main unit:**

(1)	CNC-200A Controller	(2)	Safety cover
(3)	Tensioner rack	(4)	Winding mechanism
(5)	Spindle mechanism	(6)	Tailstock mechanism

E3 Summary of purchased components



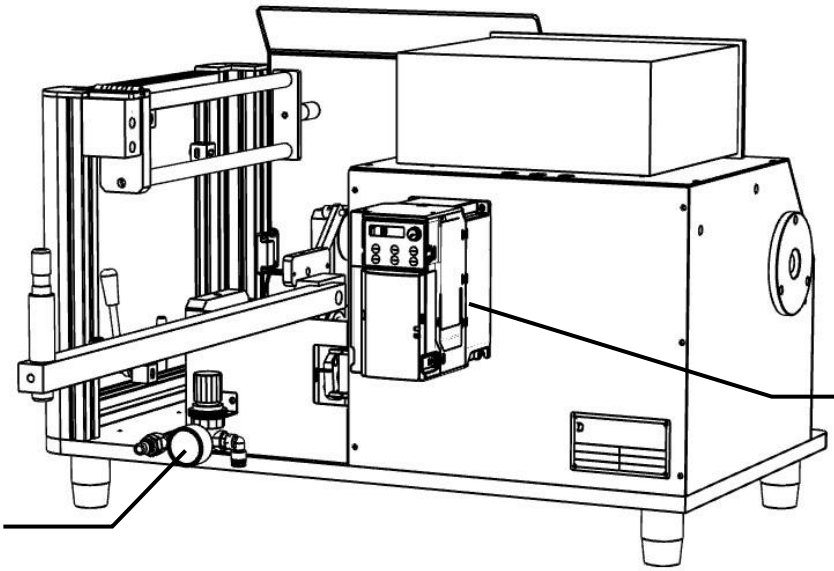
STEP Motor
C-MT-SP-005-2
EXTION

Timing Belt
B-530-5GT-17
WDF

AC Motor
C-MT-AC-052-1
TECO

Hand valve
D-MVHC-202-4H-6A
MINDMAN

Dual-rod cylinder
D-MCDA-03-25-60
MINDMAN



Variable Frequency Drive
C-VFD4A8MS11ANSAA
Delta

Air pressure gauge
D-O.MRS-08-B-4
NORGREN

F. CNC-200A User manual

CONTENTS

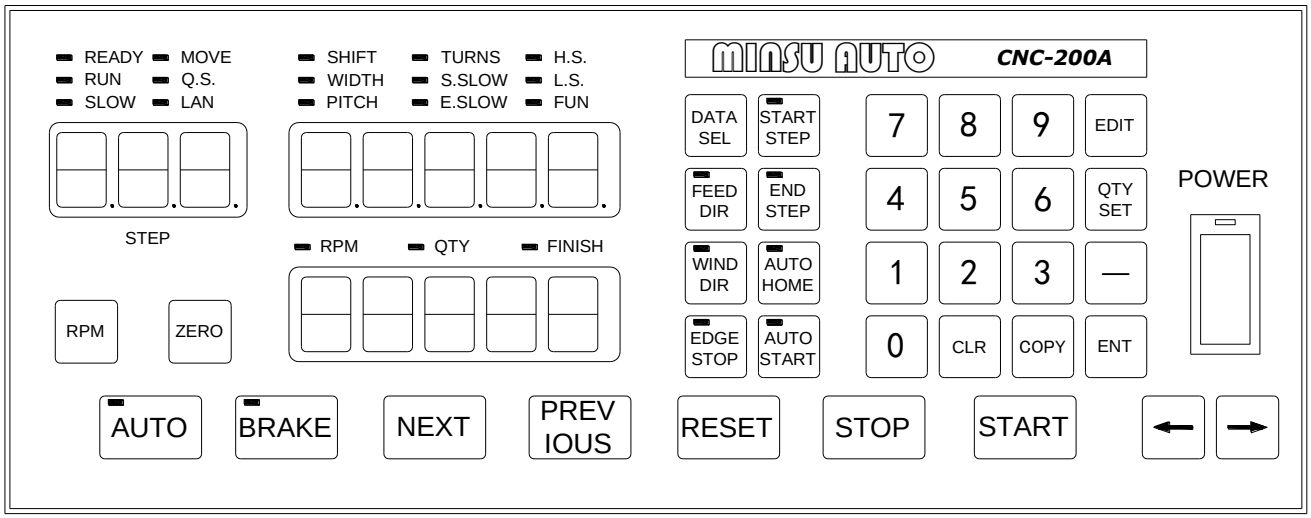
1. INTRODUCTION

CNC-200A is a series of COIL WINDING MACHINE CONTROLLER developed by **MINSU AUTOMATION**. It not only retains all the features of previous designs, it also has a low noise level and is less sensitive to external power fluctuation.
CNC-200A also features an integrated design: putting stepper motor driver, DC motor speed controller, brake and power supplier control circuits into one control box, simultaneously achieving size reduction, high performance and low cost.

2. MAIN FEATURES

- **Single chip Microprocessor design, has further higher performance and higher functions; it also has less sensitive to external power fluctuation or to external electromagnetic interference.**
- **Memory use FLASH ROM, capacity capable storing up to 1000 steps winding data, 9 winding parameters, and 5 options can be independently assigned for each step. Off-power memory retention without battery.**
- **Winding speed can be specified using the front panel keypad, resulting in easy programming of multi-step, multi-speed settings.**
- **Guiding traverse shaft stepper motor with a constant-current driver offering fast wire guiding speeds.**
- **Guiding traverse shaft offering 10 steps moving speed selection.**
- **Software can be update through the personal computer.**
- **Power input AC100V~120V、220V~240V 600VA(max).**

3. FRONT PANEL DESCRIPTION



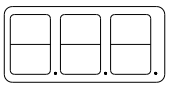
3.1. Power switch

Power supplier equipped, controls the AC power to the controller.

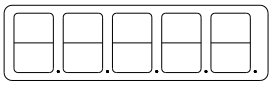
3.2. Key pads

0 ~ 9 : 10 key, for entering numerical values.
EDIT : Enter into EDIT mode.
QTY SET : Specify target production quantity.
START STEP : Specify starting step in memory.
END STEP : Specify ending step in memory.
DATA SEL : Select item of parameter during edit , or to switch display mode during running.
FEED DIR : Select guiding direction for each step during edit.
WIND DIR : Select winding direction for each step during edit.
EDGE STOP : To specify whether to suspend winding, during the guiding traverse moving to the edges of the width.
AUTO HOME : Select whether to have auto-positioning function for each step.
AUTO START : Select whether to have auto-starting function for each step.
— : Reduce step number by one, or reduce production counter by one.
CLR : During programming, clear current data to zero.
COPY : Copy the data of previous step into current step.
ENT : Write data into memory.
RPM : Switch display to shows between production counter and speed (RPM).
ZERO : Hold down this key for two seconds to reset production counter.
AUTO : Switch between automatic and manual mode.
BRAKE : Switch the brake between lock and unlock during motor stop.
NEXT : Skip current step and go to the next step.
PREV IOUS : Discard current step and go to the previous step
RESET : At any time, discontinues current operation and return to ready mode.
STOP : Pause during winding.
START : Restart during pause, or pause during winding.

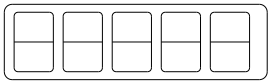
3.3. Digital display



STEP DISPLAY：Show the current step number being wound or being programmed.



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



COUNTER DISPLAY：Shows production counter or RPM.

3.4. Status indicators

☐**READY :** Lit means in READY mode, flash means PAUSE mode, Not lit means winding or programming in progress.
☐**RUN :** Lit means winding in progress**;** not lit means not in progress.
☐**SLOW :** During winding, lit means low speed winding**;** not lit means high speed winding.
☐**MOVE :** Lit means guiding traverse is fixing the starting position for winding or is returning to the home position.
☐**CUT :** Lit means wire break, stop winding.
☐**FINISH:** Will lit when reaching the preset production counter display count.
☐**RPM :** Lit means the counter display shows RPM.
☐**QTY :** Lit means the counter display shows production counter.

3.5. Winding parameters definitions

☐**SHIFT :** Start position of the guiding traverse. [Setting range 0.00~ 999.99 mm].
☐**WIDTH :** Guiding region of the guiding traverse . [Setting range 0 ~999.99 mm].
☐**PITCH :** Diameter of the copper wire. [Setting range 0~ 9.999mm].
☐**TURNS :** Total number of turns to be wound. [Setting range 0.0~9999.9 or 0~99999 turns].
☐**S.SLOW :** Number of turns to be wound at low speed, when start winding. [Setting range 0~999.9 turns].
☐**E.SLOW :** Number of turns to be done at low speed prior to stopping. [Setting range 0~999.9 turns].
☐**H.S. :** High winding speed. [Setting range from 0~99%].
☐**L.S. :** Low winding speed. [Setting range from 0~25%].
☐**FUN :** Winding complete output signal setting.

4. PROGRAMMING WINGING PARAMETER

4.1. MEMORY RANGE SELECTION

CNC-200A 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. When setting the STEP number, the Ending step number must be larger than the Starting step number, or the winding operation will not start

◆ **Specifying starting step**

In ready mode, press START STEP 0~999 ENT to selected. [Setting range 0 ~ 999].

◆ **Specifying ending step**

In ready mode, press END STEP 0~999 ENT to selected. [Setting range 0 ~ 999].

4.2. Programming winding parameter

In READY mode, press EDIT ENT invokes the programming mode, the STEP DISPLAY shows START STEP, the parameter indicator『SHIFT』lit, the DATA DISPLAY shows SHIFT setting value, the SHIFT can be changed by pressing the numerical keys followed by the ENT key. After that the STEP number will automatically increase by one, to continue set the SHIFT for next step. When the STEP number is larger then the END STEP , the STEP number will restore to the START STEP and the indicator light will change from『SHIFT』 to『WIDTH』to specifying the width for each STEP. Repeat the same procedure using numerical keys and the ENT key, all winding parameters for each STEP can thus programmed, after that press EDIT key again to go back to ready mode.

The following functions are also available:

FEED DIR： To select guiding direction, forward or reverse.

WIND DIR： To select winding direction, clockwise or counter-clockwise.

EDGE STOP： To specify whether to suspend winding when the guiding traverse moves to the two edges of the width.

AUTO HOME： To select whether guiding traverse move to the starting position automatically or upon a manual pressing of the START key.

AUTO START： Select whether to have auto-starting function for each step.

CLR： Clear the setting value .

COPY： Copy the content of the previous step to the current step.

—： Go back to the previous step.

DATA SEL： To scroll through different parameters.

Each time when change the parameters and selections, ENT key must pressed to effect the change.

4.3. Guiding traverse shaft introduce setting

During set the 『SHIFT』, 『WIDTH』 and 『guiding traverse travel limit』, can use numeric keypad to set location data or can also use NEXT, PREVIOUS or ←, → keys to leading the guiding traverse shaft location.

4.4. Clear all winding parameter

In the READY mode, press EDIT CLR — ENT will clear all the winding parameter in the memory. Be cautious in using this function or all the data will be lost.

5. WINDING METHOD DESCRIPTION

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.

5.1. Turns counting mode

- **Absolute counting mode**
  Winding spindle shaft is capable of fixed-point stopping. Upon each restart, the turn count will reset only the integer portion of the turn's to zero, with the decimal unchanged. For example, for a previous number of 100.3 turns, when restarting the next step winding, the counting will start with 0.3 to avoid accumulation of spindle shaft free play error from consecutive windings. This counting method may cause insufficient winding by one turn. Therefore, when starting from **0**.**9**, the spindle will turn to the **0**.**0** before it starts counting.
- **Relative counting mode**
  This counting method zeros the counter upon each restart, therefore it is easy to understand and will not cause insufficient winding.

5.2. Special Wire-guiding mode

- **Interlace wire-guiding**
  If the『WIDTH』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.
- **Non wire-guiding**
  Sometimes, the winding device may be used to winding adhesive tapes or copper foil. When the wire-guiding is not needed, 『PITCH』may be adjusted to zero and the wire-guiding won't be move.

5.3. Start switch operation mode

- **ON-OFF mode**
  Press down start switch to start winding and release start switch to stop winding immediately.
- **Trigger mode**
  Press and release start switch once to start winding, press and release start switch again to stop winding

5.4. Running mode

- **Continual mode**
  Before it begins winding, if『SHIFT』of the step 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.

◆ **Edges slow mode**

The winding speed will slow down before the guiding traverse reach to the two edges of the width (work with『E. SLOW』turns). After the guiding traverse veered, then restore to hi-speed winding. (Refer to the section 7.1. edge slow mode).

◆ **Automatically circularly mode**

If AUTO key set to on, it means Automatically circularly mode, in this mode when finish a step of winding it will automatically get into next step and start winding without press START key (work with AUTO START and AUTO HOME keys).

5.5. How to set winding turns accurately

◆ **Preset method**

Set the 『E.SLOW』to zero first and then set the 『TURNS』to the desired number. Set proper parameters according to copper wire, bobbin, tension, etc, then press START to start winding. When finished, obtain the actual number of turns and calculate the number of overshot turns. Go into programming mode and subtract the number of the overshot 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 『E.SLOW』to achieve the desired number of turns.

The『L.S.』 should not be too high. The number of 『E.SLOW』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.

◆ **Double-brake method**

As the winding turns of the winding shaft reach the numbers of the『E.SLOW』, brake for a short period first. After the winding shaft stops, continue winding at low speed.

Therefore the numbers of the slow speed may be reduced and the efficiency of winding may be increased,

(Refer to the section 7.1. braking mode).

6. WINDING EXECUTION

6.1. To start winding

After set up all data items, press START key, the winding process begins in accordance with the set-up content. Press STOP key to pause winding. During winding, press the 0 key, the winding speed can be switch between high speed and low speed.

The following key functions are available during PAUSE mode:

PREVIOUS： Give up the numbers of the winding turns and regress one step.

NEXT： Finish current step and proceed to next step.

START： Continue winding.

RESET： Give up winding and go back to the READY mode.

6.2. Change the display mode

During winding or during PAUSE mode, press DATA SEL key, the DATA DISPLAY can be change the display mode between turns or guiding traverse position.

6.3. Winding speed (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.

6.4. Production counter management

Upon turning on the power, the counter display will show the production counter. During wining, each time the winding process goes from the START STEP to the END STEP, the counter will automatically increase by one.

- **Preset production counter：**
  In READY mode, press QTY SET key once and key in desired values 0~99999 followed by the ENT key. During winding when the production counter reaches the preset value, the FINISH led will lit. [Setting range 0~99999].
- **Decrease production counter：**
  During READY or PAUSE mode, press the — key and hold down for two seconds the piece counter will decrease by one.
- **Reset production counter：**
  In any time holding down ZERO key for two seconds, it will set the piece counter to zero.

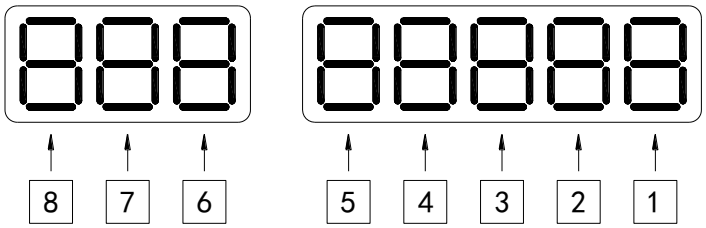
7. CONFIGURATION SETTING

CNC-200A is a multi-purpose design, to meet various requirements; additional settings are configured to provide flexibility for additional applications.

In the READY mode, press the following keys combination as section **[7.1. ~7.10],** the DATA DISPLAY will show corresponding setting value. If no change is necessary, press the ENT key get back to READY mode. Or press − key to get into change mode, then the parameter can be changed by pressing the numerical key followed by the ENT key.

7.1. Winding mode selection EDIT DATA SEL 0 Initial value[10010100]

In this function the STEP display and the DATA display will shows eight digits, representing eight winding mode selections respectively.Press numerical keys as below to set each digit.



1 **NO Function**

2 **Control Mode**：Select control mode of winding spindle driver.

0 represents CW=Forward/Stop, CCW=Reverse/Stop.

1 represents RUN=Motion/stop, DIR=Forward/Reverse,

3 **Counting mode**：Select the counting mode of the winding spindle shaft.

0 represents with zero point and using absolute counting mode.

1 represents without zero point and using relative counting mode.

2 represents with zero point and using relative counting mode.

3 represents without zero point and using absolute 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 **Guiding traverse unit**：Select the basic unit of guiding traverse.

0 represents **mm; 1** represents **inch** (must using lead screw in imperial).

8 **Operation mode**：Select operation mode for the START switch.

0 represents ON-OFF mode**; 1** represents Trigger mode.

The START key on the front panel always as the Trigger mode.

7.2. Station number EDIT DATA SEL 1 Initial value[0]

[Setting range 01~99].

7.3. Password EDIT DATA SEL 2 Initial value[0000]

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 EDIT, START STEP, END STEP, QTY SET keys. If the password has been passed once, you can change any data in normal sequence until you turn off the power or press RESET key. You must to remember the password or you cannot change any data.

[Setting range 0000~9999]. Set 0000 means no password.

7.4. Travel limit EDIT DATA SEL 3 Initial value[999.99]

Set the maximum travel distance of guiding traverse. During winding when 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]. 999.99 Means no limit.

7.5. Fixed location EDIT DATA SEL 4 Initial value[1]

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.

7.6. Limited winding speed EDIT DATA SEL 5 Initial value[0]

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 PITCH of current step, and then to limited maximum winding speed of current step.
[Setting range 0~ 99999]. Set 0 means no limit speed.

7.7. Brake holding time EDIT DATA SEL 6 Initial value[0.3]

To set the hold times for brake. [Setting range 0.1~9.9 sec].

7.8. Guiding traverse moving speed selection EDIT DATA SEL 7 Initial value[20]

The speed at which the guiding traverse moving to the starting position and returning to the home position. [Setting range 0~99].

7.9. Moving increment EDIT DATA SEL 8 Initial value[2.00]

Guiding traverse moving increment. This value is calculated according
to the specification of winding machines.[Setting range 0.01~99.99].
Moving increment＝(Screw pitch×Gear ratio÷Resolution of guiding motor)
Example： Screw pitch＝5mm、Gear ratio=1.6、Resolution of guiding motor＝400
Moving increment＝5×1.6÷400＝0.02mm
Setting value= Moving increment×100=0.02×100=2.00

7.10. Acceleration times EDIT DATA SEL 9 Initial value[0]

Set the accelerate times for the winding spindle [Setting range 00~99].
00 means shortest acceleration times ；**99** means longest acceleration times.
T(ms)＝（H.S.－L.S.）×【（N＋1）×2】

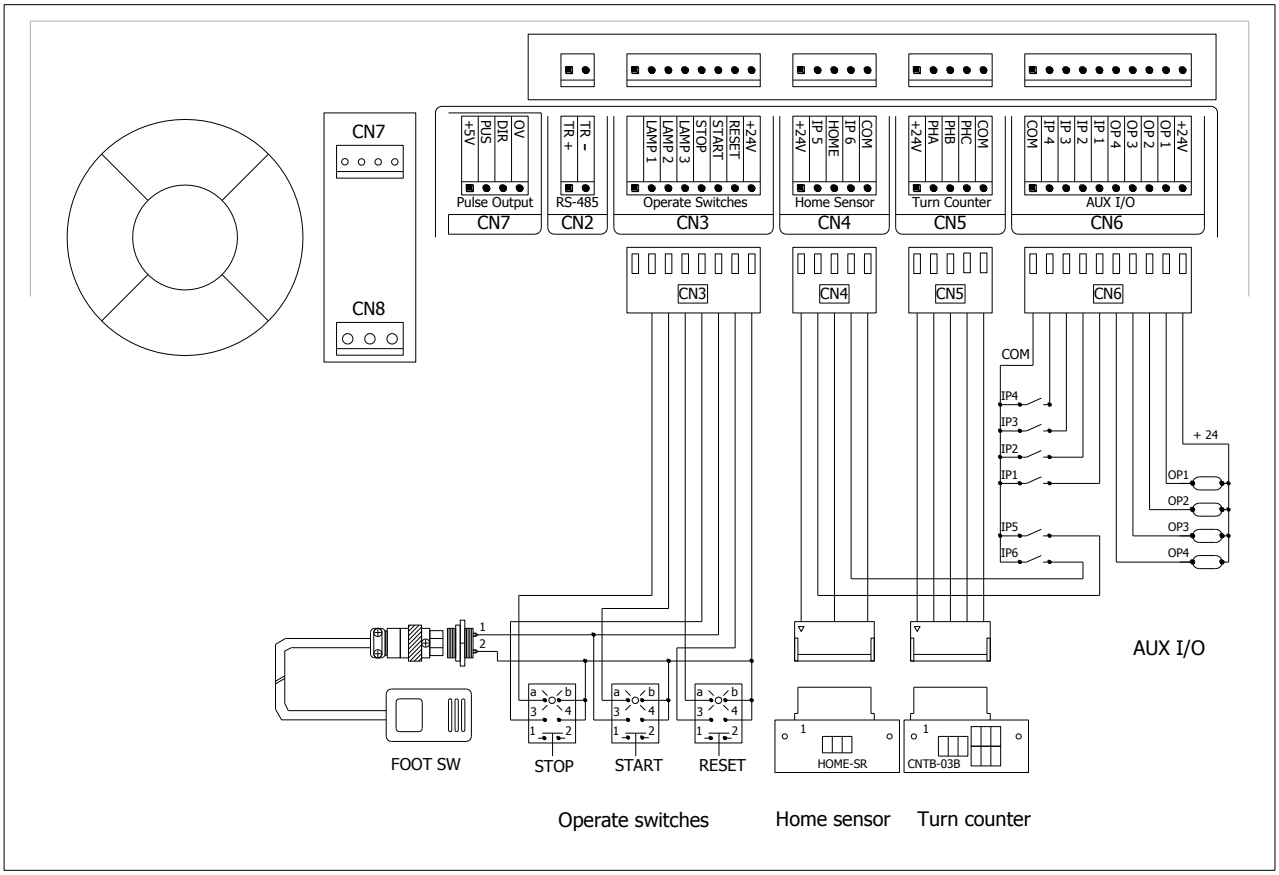
7.11. Reset all configuration data EDIT CLR 0 ENT

In READY mode press EDIT CLR 0 ENT keys, it will reset all the configuration data and replace by initial data. Be cautious in use this function.

8. INSTALLATION AND WIRING

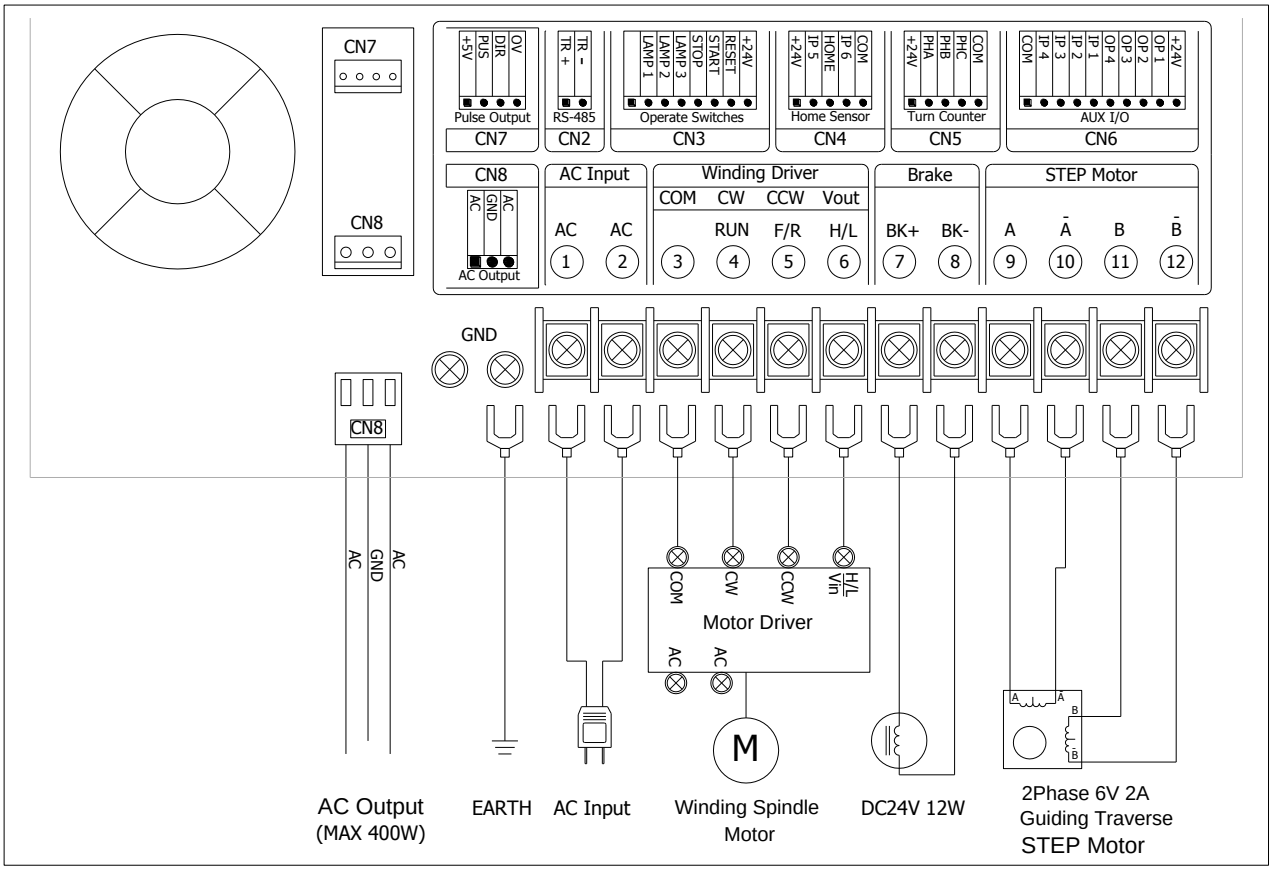
- **The controllers should be operated in an environment that is protected from moisture, corrosive gases, or liquid, and free from airborne dust, metallic particles, and magnetic noise.**
- **Do not block the intake/exhaust ports of the controller. Otherwise, a fault may occur.**
- **Make sure that the power source supplies the correct voltage and is capable of supplying the required current to the controllers.**
- **Do not connect or disconnect wires and connectors while power is applied to the controller.**
- **Make sure the machine and controllers are properly grounded.**
- **Make sure that the leads and connectors are connected correctly.**
- **Normally operate under 10℃ ~ 40℃ environment; over 40℃ should perform under good ventilation, avoid heating.**

8.1. Wiring diagram for CN2~CN6

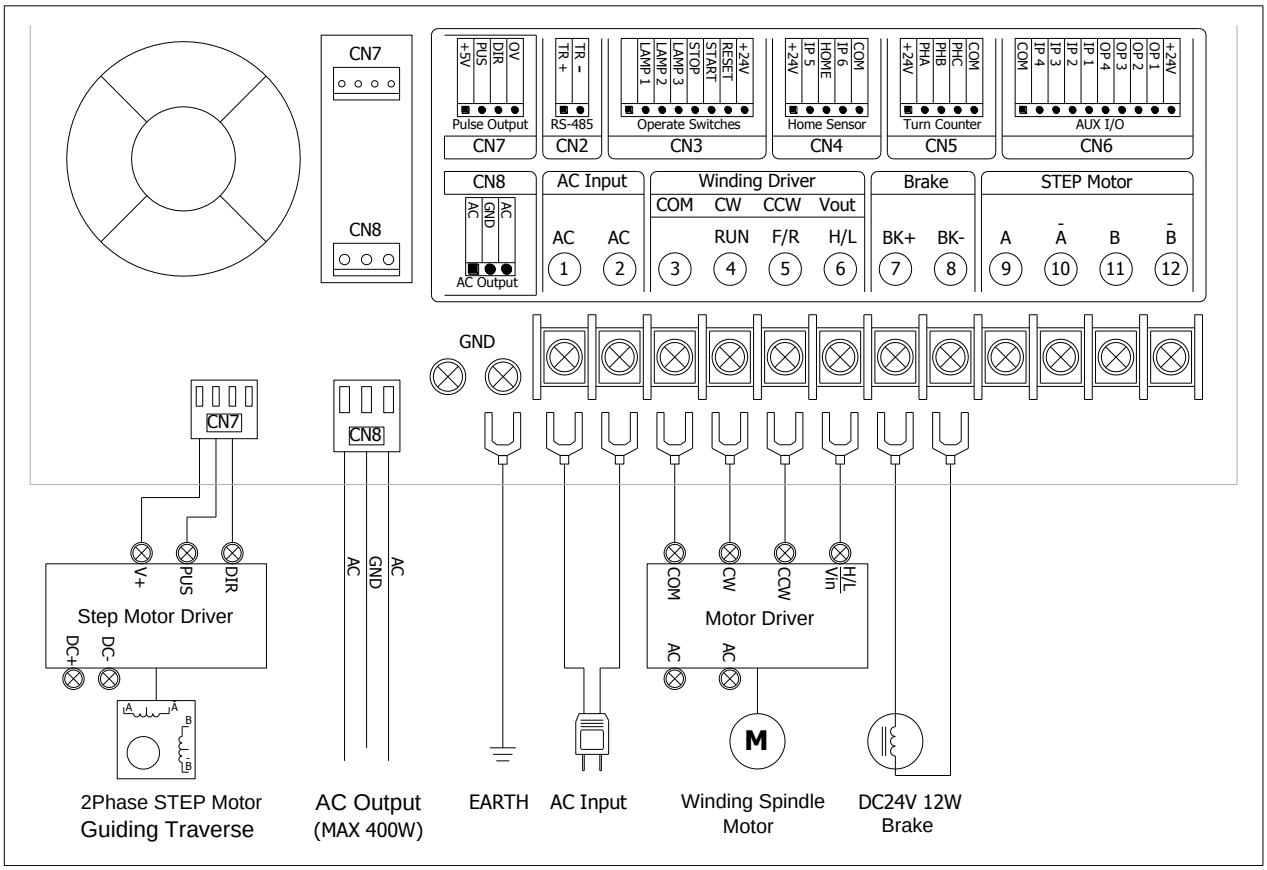


8.4. Wiring diagram

◆ Drive STEP Motor in directly



◆ External connect STEP Motor driver



9. MAINTAIN AND TROUBLESHOOTING

9.1. Periodically maintain

- **Please periodically clean up the controller inner accumulate dust and dopants.**
- **Please periodically check the wire connection between controller and machine if have loose or bad contact.**
- **The following parts must be maintained or changed periodically as list below. If any part is found faulty, it must be changed immediately even when it has not yet reached the end of its life, which depends on the operating method and environmental condition.**
- **For parts replacement, please contact your sales representative.**

9.2. Error message

When a fault occurs during operation, the DATA DISPLAY shows error massage, stop winding and then RESET go back to the READY mode.

Err-0： The parameters or data in memory are fault.

Err-1： The『SHIFT』value sets exceed the Travel Limit.

Err-2： During winding, the guiding traverse to exceed the Travel Limit.

Err-3： During winding, the guiding traverses reach to the Home sensor.

Err-p： Password error, key in 4 numbers password before edit.

9.3. To abort seeks the original position

At boot and reset procedures, if because of unknown reason however engender the winding shaft and guiding traverse can't find out the original position and make the controller can't get into ready mode, can press key to abort seeks the original position, make controller get into ready mode.

9.4. Troubleshooting

This section provides information to guide the user in understanding different fault condition and their general troubleshooting procedures, and with their possible solutions.

- **Do not connect or disconnect wires and connectors while power is applied to the controller.**
- **Make sure that the leads and connectors are connected correctly, before doing the troubleshooting procedures.**
- **Do not remove welded parts on the PC board without appropriate tools.**

NO	Fault Description	Correctives Action
1	Power ON, but the display shows nothing.	**a.** Check AC power input. **b.** Check the LED lamp on TLP-503D power supply, if not lit replace TLP-503D **c.** Replace 200A-CPU.

2	Power ON, but the display shows confusion massage	**a.** Replace 200A-CPU.
3	Power ON, but winding spindle didn't rotate, or cannot stop rotation, And controller cannot get into ready mode.	**a.** Press STOP to make the controller get into READY mode. **b.** Check the winding parameter『L.S.』setting value of START STEP **c.** Replace turns counter CNTB-03B. **d.** Replace 200A-CPU.
4	Power ON, but guiding traverse didn't move or cannot stop moving, And controller cannot get into ready mode.	**a.** Press STOP to make the controller get into READY mode. **b.** Replace HOME SENSOR. **c.** Replace 200A-DVR. **d.** Replace 200A-CPU.
5	Cannot edit parameters.	**a.** Check the READY LED lamp if not lit, do procedures number 3 and 4. **b.** Key in four numbers password before edit, if the password has been set before. **c.** Replace 200-KBD. **d.** Replace 200A-CPU.
6	Display shows Err-0, then reset, and get into READY mode.	**a.** Replace 200A-CPU.
7	Display shows Err-1/Err-2 then reset and get into READY mode.	**a.** Check winding parameters『SHIFT』and『WIDTH』setting value. **b.** Check configurations 『TRAVEL LIMIT』setting value.
8	Display shows Err-3, then reset, and get into READY mode.	**a.** Check winding parameters『SHIFT』and『WIDTH』setting value. **b.** Replace HOME SENSOR.
9	Brake failure.	**a.** Check wire connections of brake. **b.** Replace brake. **c.** Replace 200A-DVR.
10	Winding spindle can not switching winding direction.	**a.** Check configurations 『Winding spindle control mode selection 』setting value. **b.** Replace 200A-CPU.
11	Counting failure. Replace turns counter CNTB-03B.	Replace 200A-CPU.
12	Guiding traverse moves half pitch or double pitch.	Check Configurations『Moving increment』setting value.