全自动绕线机

H Y - R 1 8

Automatic Winding Machine

HY-R18

使用说明书

Operating Instruction

东莞市慧越自动化设备科技有限公司

HUIYUE (DongGuan City) Automation Equipment Co., Ltd.

■Specification of mechanical functions

Control mode	Four-axis Panasonic servo motor/Weinview human-computer interface
Program storage	1～30 programs can be stored, 30 in all
Number of principle axes	12
Speed of principle axis	MAX10000rpm
Space between principle axes	45 ㎜
Servo motor power of principal axis	Standard 1500W
Servo motor power of moving coordinates	X/Y/Z:200W
Diameter of quick coupling	10 ㎜
Applicable wire diameter	0.03～0.4 ㎜
Swing diameter	MAX30 ㎜
Amount of movement of coordinates	X:100 ㎜ Y:140 ㎜ Z:70 ㎜
Movement speed of coordinates	250 ㎜/s
Angle of guide pin lever	0°/90°, 135° is optional
Power source	AC200～220V single phase 50/60HZ
Power consumption	1500W
Air pressure requirement	0.49～0.59 ㎏ f/c ㎡
External dimension	L1350 ㎜×W1100 ㎜×H1800 ㎜
Machine weight	500 ㎏

■ Functional characteristic: ※ this machine is designed for winding of bobbin coil.

1. Touch human-computer interface system;
2. Chinese or English operating system can be chosen according to customer requirements;
3. Fixtures can be replaced quickly with quick couplings;
4. Replacement of product model is simple;
5. Program setting, save and call-out is simple and convenient;
6. Angle of principle axis can be set arbitrarily;
7. Simple construction, safe and easy operation, low failure rate and convenient maintenance.

～Contents～

Introduction

This is the instruction for WM12-45(TP/TW) automatic winding machine. Please carefully read the operating instruction before use. TP is automatic wrapping device, and TW is automatic device for twisting wires, the configuration of which varies with customer requirements.

This model is independently developed and designed by Jinhuayi Technology Co., Ltd. With excellent performance and reliable operation, it is mainly used for automatic winding of transformer, relay, pulsed coil, etc. This machine is widely used. It can be used for winding and wrapping of different products just by replacing a few simple fixtures.

Table 1-1 Content of modification

Date	Content
December 2011	新規作成

1. Guide to Safe Use of Equipment

Warning

- The equipment will be seriously damaged if it is not used as required. Therefore, managers, operators and spot inspection and maintenance personnel must carefully read the operating instruction before operation or spot inspection and maintenance.

- In order to check the operating instruction conveniently, please keep it near the equipment. Operators and relevant personnel shall regularly read it.

- Please pay attention to the following when the machine is running:

- Please operate and use the equipment after carefully reading and understanding the instruction.

- The instruction shall be kept nearby for reading repeatedly.

- As the equipment will be continuously improved according to different requirements of product, please contact with the company in case of discrepancy between the material object and instruction or ambiguity.

- Please confirm the direction of movement of axes before operation. The movement of machine varies with model, so please refer to the label of axial direction on the machine.

- Replacement of power line must be conducted by qualified personnel, and power must be cut off before wiring to prevent electric shock from endangering personal safety.

- Don’t get close to the machinery with hand or body when the machinery is running to avoid accidents.

- Cut off the main power source and air source when oiling the machinery, replacing parts or cleaning.

- Confirm people and dangerous articles around the machinery before regular

maintenance and spot inspection.

- Pay attention to personal and mechanical safety when using the equipment at LINE.

- The mechanical parameters in the controller have been subject to the most suitable setting when leaving the factory. The machine will break down when these parameters are lost due to misoperation. In such case, please contact with the company.

1-1 Brief Description of Equipment Safety

- In order to prevent personal safety accident or damage to equipment when the equipment is running, relevant safety facilities and warning signs are formulated and set up.

- The equipment is equipped with various safety devices. After the safety devices are removed, using parts that are not specified by the company or unsafe transformation of the machinery may cause safety accidents.

- There are many safety matters deserving attention of operators in installation, operation, maintenance and spot inspection of equipment. The instruction only records part of them. Please pay special attention in operation.

- Failure to observe safety precautions, misoperation, or ignoring safety rules may cause personal safety or equipment safety accident. Therefore, please carefully read and understand safety precautions before use, operation, maintenance and spot inspection of the equipment.

1-2 Environment and Conditions of Equipment Setting

- The equipment must be installed indoors.
- The desk or table where the equipment is installed shall be stable and reliable, and horizontal.
- The indoor temperature shall be ５℃～３５℃.
- The place where equipment is installed shall avoid direct sunlight, and erosion of rain or dew.
- The place where equipment is installed shall avoid dramatic change in temperature and high humidity to protect surface of machinery, electrical control panel and components against damp.
- The equipment shall be far away from water, cutting oil, ablution, etc.
- The equipment shall be far away from metal smelter, forming machine and other high-temperature equipment.
- Equipment generating high-strength electromagnetic wave shall not be set around the equipment.
- Inflammable, explosive and corrosive articles shall not be placed around the equipment.
- Machines making noise (welding machine) shall not be placed around the equipment.

1-3 Precautions on Mechanical Operation

- Please prepare safety protective tools (e.g. safety glasses, safety shoes, etc.), and put on them if necessary!
- Please pay attention to your clothes in operation to avoid being jammed by moving parts of machinery or entangled by running parts. The length of oversleeve shall be suitable. Operators with long hair shall also wear working caps to prevent personal injury.
- Don’t operate with gloves on to avoid entangling the hand in misoperation to cause injury.
- Don’t touch the switch of equipment with hands with oil or water to avoid electric shock.
- Please acquaint yourself with the role and position of switches before operation to promptly and effectively handle accidents (if any). Press emergency stop switch to stop the machine in emergency.
- Please operate the equipment within scope of mechanical ability. Overload operation is forbidden.
- The machinery shall be dry without dust and dangerous articles around.
- Save the program before turning the power off in case of program change, otherwise the changed program will not be reproduced.

2. Operating Instruction for Equipment

2-1 Description of Operation Panel of Equipment

Figure 2-1 Manual operation board

1) EM.STOP button (①)

Please press this button to stop the machine in unusual conditions. In addition, if the machinery breaks down for some reason, please press this button to stop it. Rotate clockwise to relieve the switch.

The power of servo controllers will be cut off and axes will be loose after pressing EM.STOP button.

2) RESET button (②)

After supplying power and gas in initial state, please press this switch when original point is reset.

When the indicator light is on: the machinery is at original point.

When the indicator light is out: axis or air cylinder is not at original point.

3) STOP button (③)

Please press this switch to pause or stop the machinery in automatic

operation. Press this switch once to pause the machinery in automatic operation, or stop the machinery in single step run until pressing START to start it. Press this button twice to stop the machinery and start the machinery only for reset.

In addition, when alarm is given for failure of equipment, press STOP to stop the alarm sound.

When the indicator light is on: machinery stops.

When the indicator light is out: machinery is running.

4) START button (④)

Press START to prepare for reset of original point before reset. Press START once in single step run after reset, the machinery will run by one step according to the designated procedure.

When the indicator light is on: machinery is running.

5) Touch screen (⑤)

Please see 「3 description of indication of touch key」 for details of function buttons.

·2-2 Description of Power Source

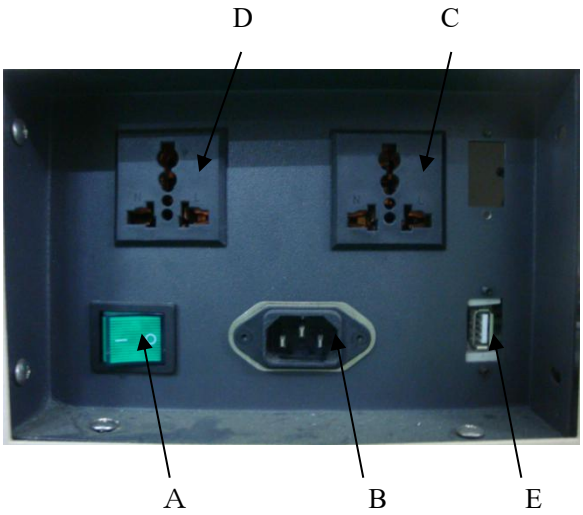


Figure 2-2 Power source (on the right of equipment)

Description of parts

A) Power switch

Main power switch

B) Input power socket

Input power voltage of 220V is used for input power plug.

C.D) Output power socket

Output voltage of 220V is used for output power plug.

E) USB interface

Used for copying program from controller to U disk.

3. Operating Instruction for Touch Screen

3-1 Operation Method for Main Operation Screen

Figure 3-1 Home screen

The above is general screen.
Operation method: press the touch key with functions to enter the screen of detailed functions.
Please press return key for interconvesion of screens.

Operating instruction for function keys:

- Manual operation…… manual movement of axes
- I/O operation ……confirmation of manual and input signals of air cylinders
- Parameter setting ……setting of system parameters
- File management……file editing, modification and real-time operation
- Alarm information….confirmation of alarm information in case of alarm
- Stop ……key for stopping the equipment
- Reset …… key for reset of original point of machine
- Start …… key for operation of equipment
- Continuous winding ……key for switch of single step/continuous winding
- Preset OFF……key for automatic continuous operation
- File number ……current running file, click the black picture frame for 3s to change the file number.
- Set output……preset output, click black picture frame to set output.

· Current output……production counting, click the black picture frame for 3s to increase/decrease or reset production number.

Other display areas are system time, coordinate position of axes, system status, cycling time of a cycle, etc.

3-1-1 Manual Operation

Touch “Manual Operation” under “Home Screen” to skip to screen of Figure 3-1-1 “Manual Operation”. Click “I/O Operation” to skip to Figure 3-2-1 “Output Test 1”. The two screens can switch.

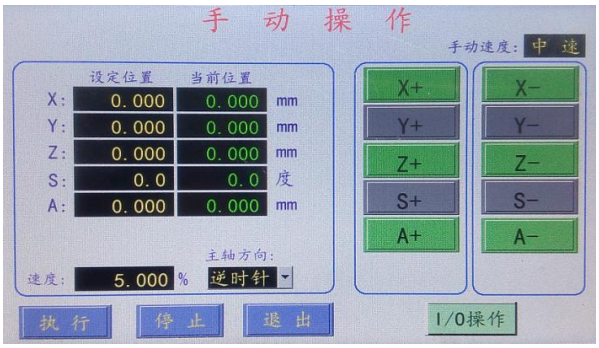


Figure 3-1-1 Manual operation

Operating instruction for function keys:

- Manual speed ……manual movement speed of axes, click the black picture frame to switch to low speed/medium speed/high speed
- X - / X +……leftward/rightward movement of X axis
- Y - / Y +……backward/forward movement of Y axis
- Z - / Z +……upward/downward movement of Z axis
- S - / S +……counterclockwise/clockwise rotation of principal axis
- A - /A+……backward/forward movement of trapper
- I/O operation……switch to page of I/O operation
- Exit ……exit from page of manual operation and return to home page.

The coordinate value or angle of X/Y/Z/S/A, speed of 1% ～ 100%, and direction of principal axis: nonparticipation/clockwise/counterclockwise, can be set on this interface. Click “Execute”, axes will move to corresponding position, when the working coordinate is at the set position. Press “Stop” in execution to stop operation, and execute to the set position again.

3-1-2 I/O Operation

Touch “I/O Operation” under “Home Screen” to skip to screen of Figure 3-1-2 “Output Test 1”. Click “Page Down” to skip to Figure 3-1-2 “Output Test 2”, and click “Page Down” to skip to Figure 3-1-2 “Output Test 3”. On this screen, manually operate air cylinders and monitor the signal state of input transducers. Click “Page Down” to skip to Figure 3-1-2 “Output Test 4”.

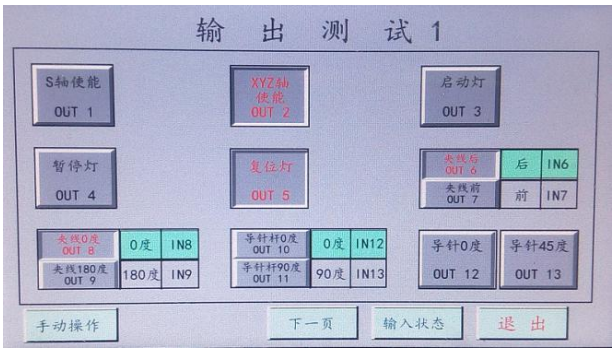


Figure 3-1-2-1 Output test 1

Figure 3-1-2-2 Output test 2

Figure 3-1-2-3 Output test 3

Figure 3-1-2-4 Output test 4

Touch “Input State” under “Output Test” to skip to Figure 3-1-2 “Input Signal State 1”, click “Page Down” to skip to Figure 3-1-2 “Input Signal State 12”, and click “Return” to return to the home screen.

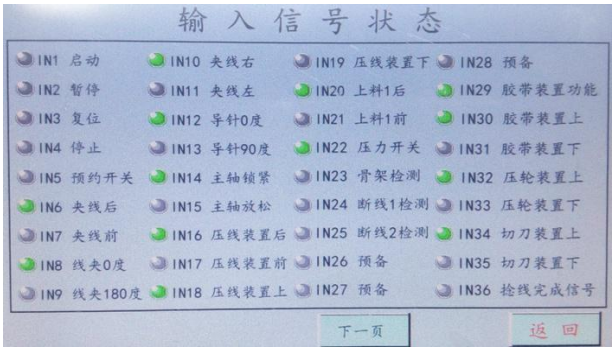


Figure 3-1-2-4 Input signal state 1

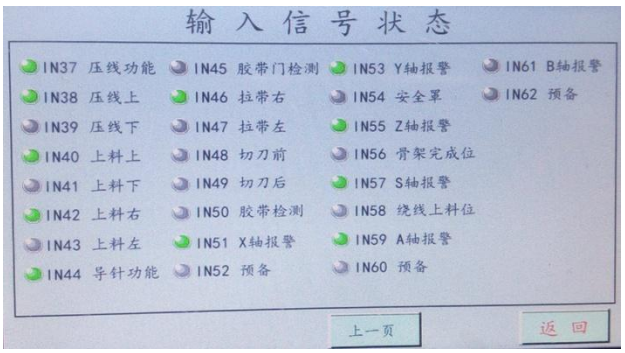


Figure 3-1-2-5 Input signal state 2

3-1-3 Parameter Setting

Touch “Parameter Setting” under “Home Screen” to prompt for password. As modifying the system parameters may make the machine break down, and cause damage to equipment or personal safety accidents, it is not open to debugging personnel. Please contact with the manufacturer if you have any question!

Figure 3-1-3-1 Parameter setting of home page

Figure 3-1-3-2 Page of parameter setting

Figure 3-1-3-3 Setting of speed parameter

Figure 3-1-3-4 Setting of compensation and limit

Figure 3-1-3-5 Setting of zero point

Figure 3-1-3-6 Teaching of setting

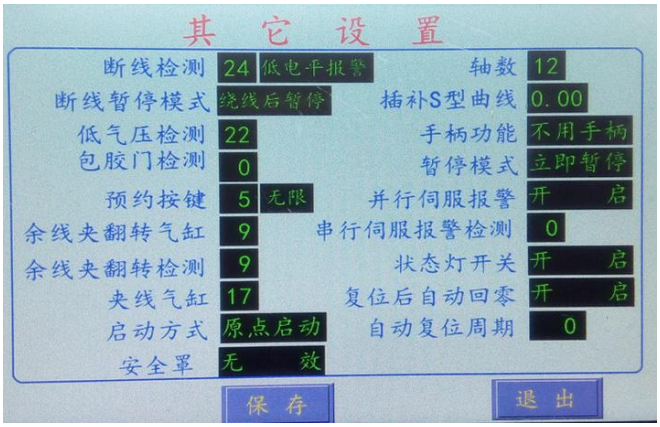


Figure 3-1-3-7 Other settings

Figure 3-1-3-8 Manufacturer’s setting

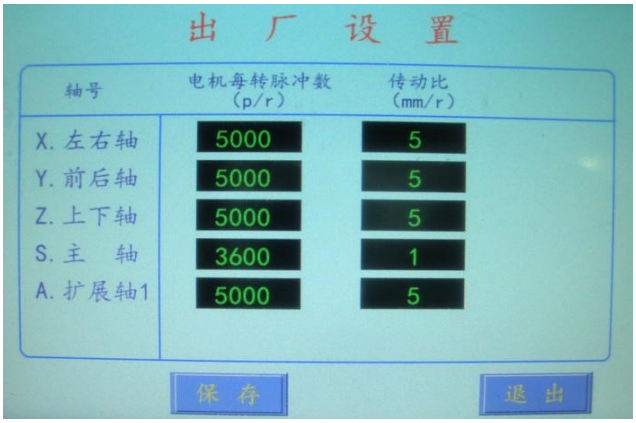


Figure 3-1-3-9 Factory setting

3-1-4 File Management

Touch “File Management” (at original point or execute reset) under “Home Screen” to skip to the page of file management.

File management

Operating instruction for function keys:

- Current file····· display the current file number
- File name····· display the current file name, click the black picture frame to change file name.
- File transfer ·····realize file copying between the controller and U disk
- Up/down ····· move the red cursor up and down.
- Page up/down····· change of page.
- New ····· establish new program file.
- Delete ····· delete the program file.
- Copy ·····copy the program file.
- Paste ····· paste the program file.
- Browse ····· browse all steps of the program file.
- Return ·····return to the home screen.

File transfer

Operating instruction for function keys:

- Upload ……copy the file from U disk to the controller.
- Download ……copy the file from controller to U disk.
- Up/down …… move the red cursor up and down.
- Page up/down…… change of page.
- Connect …… realize connection between U disk and controller.
- Disconnect …… disconnect U disk and controller.
- State of U disk …… display connection state of U disk and controller (connected/ disconnected).
- File ID ……ID is needed for downloading files (any number of 1～2 digits).
- Number of steps……display number of steps of the program file of controller or U disk.
- Return ……return to the home screen.

Upload file: insert U disk into USB interface of winding controller, click it for connection, U disk will be shown to be connected. Click file ID, input ID of the file to be uploaded, click to read the file of current ID in the U disk, click it to upload, wait for about 10s or more, the file will be uploaded when“U_FILE” is displayed on the left of screen. Move the red cursor up and down to choose the file, click it to browse. The program can be renamed and edited and manual teaching can be executed.

Download file: insert U disk into USB interface of winding controller, click it for connection, U disk will be shown to be connected. Click file ID, input ID of the file to be downloaded, move the red cursor up and down to choose the file, click it to download, wait for about 10s or more, the file will be downloaded when“number of steps ***” is displayed on the right of screen.

File browsing

Click “Browse” on the screen of file management, and check the step of the whole program through “Page Up” and “Page Down”. Click “Edit” to edit and modify online operation.

Program instruction

Operating instruction for function keys:

- Move ……instruction for movement of coordinates.
- Output ……instruction for output of movement of air cylinder
- Output wait …… instruction for setting designated output port on/off, and testing transducer at corresponding position after the required time.
- Wait for input …… instruction for test and output of transducer status at corresponding position.
- Time wait…… instruction for automatic waiting of the program at this step.
- Input wait ……instruction for testing input signal of transducer.
- Terminal winding ……instruction for winding of product terminal.
- Positioning of principal axis …… instruction for turning angle of principal axis.
- Synchronous throwing…… instruction for synchronously clearing copper wire ends in winding.
- Winding …… instruction for winding.
- Pause …… instruction for pausing equipment in continuous operation
- Cycle …… instruction for repeated movement.
- Bobbin test……instruction for testing input state
- End of program …… instruction for end of program.

Other instructions: special-shaped winding/ input skip/setting of zero point/ skip/matrix/ linkage of six axes/return to zero/file selection/expand AB axes/wrapping test, temporarily unused (used on special occasion)

Move instruction

Operating instruction for function keys:

- Line number ····· number of currently running step of program.
- Type ····· program instruction at current step.
- Current file·····code of program in operation.
- File name·····name of program in operation.
- New ····· instruction for establishing new program.
- Last line·····return to the last program instruction.
- Next line·····skip to the next program instruction.
- Insert ·····insert a program instruction before the current program instruction.
- Delete ····· delete step of current program.
- Save ·····save the new or modified program.
- Set position·····set position of coordinates to be executed of axes.
- Working coordinate·····current coordinate position of machinery.
- Manual speed ·····manual movement speed of axes, low speed/medium speed/high speed are optional.
- Direction of principal axis·····direction of rotation of S axis, or clockwise/counterclockwise/nonparticipation are optional.
- Speed ·····movement speed of axes of machine.
- Test run·····click “Test Run” to move to corresponding position after “Setting Position”.
- Load ·····manually adjust to the needed coordinate position, click “load” to input coordinate.
- Stop ·····stop in test run.
- Return ·····return to previous menu
- I/O operation·····switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +·····leftward/rightward movement of X axis
- Y- / Y +·····backward/forward movement of Y axis
- Z- / Z +·····upward/downward movement of Z axis
- S- / S +·····counterclockwise/clockwise rotation of principal axis

· A- /A+……backward/forward movement of trapper

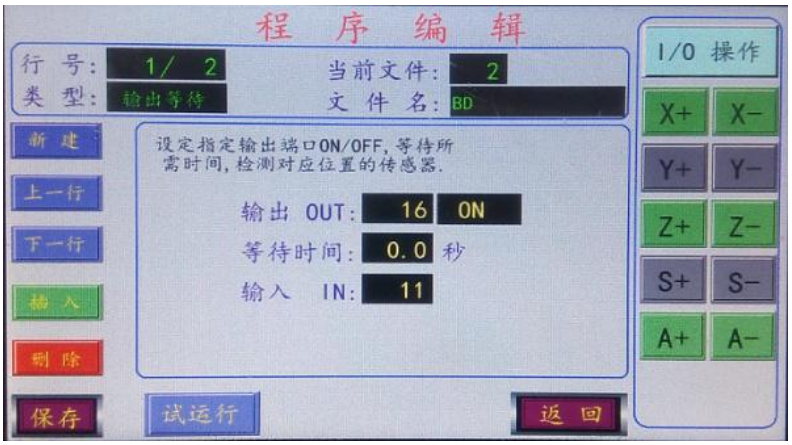
Output instruction

Operating instruction for function keys:

· Line number ……number of currently running step of program.
· Type …… program instruction at current step.
· Current file……code of program in operation.
· File name……name of program in operation.
· New …… instruction for establishing new program.
· Last line……return to the last program instruction.
· Next line……skip to the next program instruction.
· Insert ……insert a program instruction before the current program instruction.
· Delete …… delete step of current program.
· Save ……save the new or modified program.
· Output …… set number of air cylinder to be actuated (refer to corresponding number in I/O list), output is open in case of "1" and closed in case of "0". Five air cylinders can be actuated simultaneously.
· Delay …… current output of air cylinder. Wait for delay time before actuating the next air cylinder, or execute program instruction in several steps, which depends on specific circumstances in debugging. Unit of time is"S".
· Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
· Return ……return to previous menu
· I/O operation……switch to I/O state in edit state for I/O operation, and click "Return" to skip to the current line.
· X- / X +……leftward/rightward movement of X axis
· Y- / Y +……backward/forward movement of Y axis
· Z- / Z +……upward/downward movement of Z axis
· S- / S +……counterclockwise/clockwise rotation of principal axis

· A- /A+……backward/forward movement of trapper

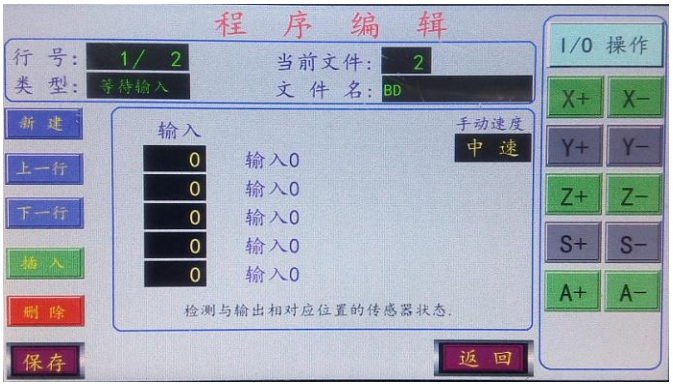
Instruction of output wait



Operating instruction for function keys:

· Line number ……number of currently running step of program.
· Type …… program instruction at current step.
· Current file……code of program in operation.
· File name……name of program in operation.
· New …… instruction for establishing new program.
· Last line……return to the last program instruction.
· Next line……skip to the next program instruction.
· Insert ……insert a program instruction before the current program instruction.
· Delete …… delete step of current program.
· Save ……save the new or modified program.
· Output OUT……corresponding output port. Refer to IO list.
· Waiting time…… in case of port output, wait for corresponding time before test of input.
· Input IN ……test of transducer of corresponding output port. Refer to IO list.
· Return ……return to previous menu
· I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
· X- / X +……leftward/rightward movement of X axis
· Y- / Y +……backward/forward movement of Y axis
· Z- / Z +……upward/downward movement of Z axis
· S- / S +……counterclockwise/clockwise rotation of principal axis
· A- /A+……backward/forward movement of trapper

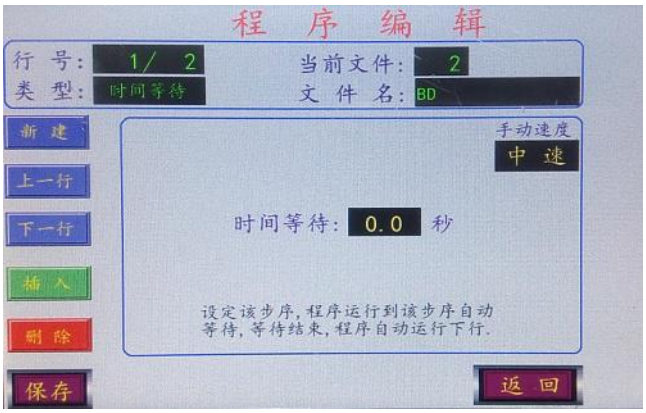
Instruction of wait for input



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Input …… after output instruction is executed, for the sake of safety, instruction of wait for input should follow the next step. Input and output number of transducer corresponding to the position of air cylinder. In case of wrong setting, alarm will pop up in automatic operation.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu
- I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +……leftward/rightward movement of X axis
- Y- / Y +……backward/forward movement of Y axis
- Z- / Z +……upward/downward movement of Z axis
- S- / S +……counterclockwise/clockwise rotation of principal axis
- A- /A+……backward/forward movement of trapper

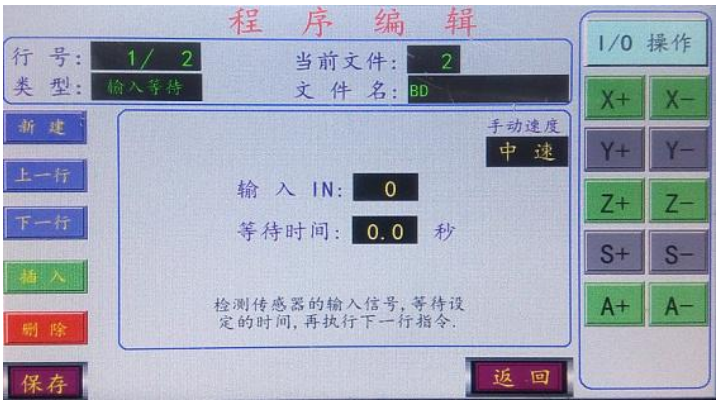
Instruction of time wait



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Time wait…… waiting time before executing the next program instruction. Unit: s.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu

Instruction of input wait



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Input IN ……corresponding input check signal. Refer to IO list.
- Waiting time ……when input conditions are met, execute the following steps after the required time.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu
- I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +……leftward/rightward movement of X axis
- Y- / Y +……backward/forward movement of Y axis
- Z- / Z +……upward/downward movement of Z axis
- S- / S +……counterclockwise/clockwise rotation of principal axis
- A- /A+……backward/forward movement of trapper

Instruction of terminal winding

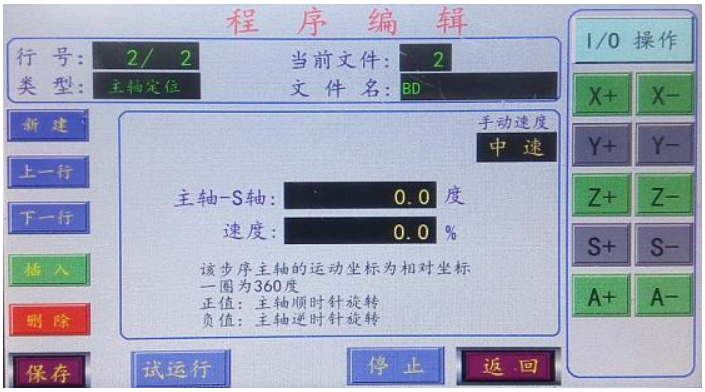
Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Number of turns …… set number of turns of terminal winding (integers not less than 0)
- Interval …… set distance of spiral movement in terminal winding.
- Angle …… set angle when terminal winding stops (0～359°with starting point).
- Speed …… set movement speed in terminal winding.
- Direction of terminal winding…… set

coordinate planes in terminal winding, horizontal (centering on Y axis), vertical (centering on Z axis), clockwise and counterclockwise, respectively.

· Center of circle …… set coordinate position of center of gyration in terminal winding.
· Load ……manually adjust to the needed coordinate position, click “load” to input coordinate.
· Working coordinate …… display the coordinate position of XYZ axes.
· Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
· Test run……click “Test Run” for terminal winding after setting of parameters.
· Stop ……stop in test run.
· Return ……return to previous menu
· I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
· X- / X +……leftward/rightward movement of X axis
· Y- / Y +……backward/forward movement of Y axis
· Z- / Z +……upward/downward movement of Z axis
· S- / S +……counterclockwise/clockwise rotation of principal axis
· A- /A+……backward/forward movement of trapper

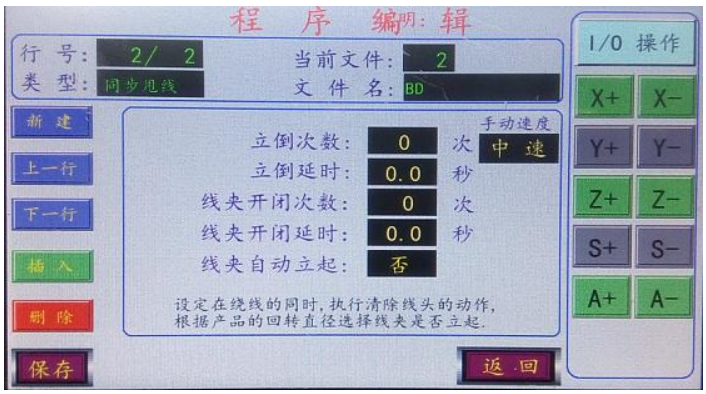
Instruction of positioning of principal axis



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Principal axis-S axis…… set rotation angle of principal axis, set value is 0～360, positive and negative set value determines the direction of rotation of principal axis. It rotates clockwise if positive, otherwise counterclockwise.
- Speed …… rotational speed of principal axis, set value is 1～100%, the larger the value, the higher the speed.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu
- I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +……leftward/rightward movement of X axis
- Y- / Y +……backward/forward movement of Y axis
- Z- / Z +……upward/downward movement of Z axis
- S- / S +……counterclockwise/clockwise rotation of principal axis
- A- /A+……backward/forward movement of trapper

Instruction of synchronous throwing



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Times of inversion …… set times of inversion of clamp from 180 °to 0°. In case of “0”, it does not reverse. In case of “1”, it reverses once, and so on. Generally, separate program instruction is needed for the clamp to reverse by 180 °.
- Delay of inversion …… set slot time for clamp to reverse from 180 °to 0°, generally “0.3” s.

- Times of opening and closing of clamp …… set times of opening and closing of clamp in inversion to cast off wire ends.
- Delay of opening and closing of clamp …… set slot time of opening and closing of clamp, generally “0.3” s.
- Whether clamp automatically erects…… set the clamp to automatically return to 0°after synchronous throwing, determined by swing diameter of product, it can be “Yes” or “No”.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu
- I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +……leftward/rightward movement of X axis
- Y- / Y +……backward/forward movement of Y axis
- Z- / Z +……upward/downward movement of Z axis
- S- / S +……counterclockwise/clockwise rotation of principal axis
- A- /A+……backward/forward movement of trapper

Winding instruction

Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Number of turns of winding ……set number of turns of winding.
- Winding displacement diameter …… set distance of movement of bobbin in winding (amount of movement of bobbin when principal axis turns a circle).
- Stop angle …… set angle when principal axis stops after winding (0～359 °with original point).
- Speed of principal axis …… set the maximum swing speed of principal axis in winding.
- Direction of winding …… set turning direction of principal axis in winding (clockwise/counterclockwise).
- Winding method …… method of winding displacement in winding, breadth priority/lap winding of same numbers/lap winding of different numbers are optional.
- Stop mode …… position where bobbin stops after winding, any point/starting point/end point are optional, correctly set as required.
- Breadth …… set winding displacement width in winding, breadth/number of turns of single layer/number of turns of odd layer are optional. When different winding methods are used, the system

automatically switches to the corresponding method of winding displacement. If breadth is positive, winding displacement of bobbin is outward. If breadth is negative, winding displacement of bobbin is inward. Positive or negative number of turns of single/odd layer also determines the direction of winding displacement.

· Acceleration time …… time from zero speed to the maximum speed when principal axis is started.

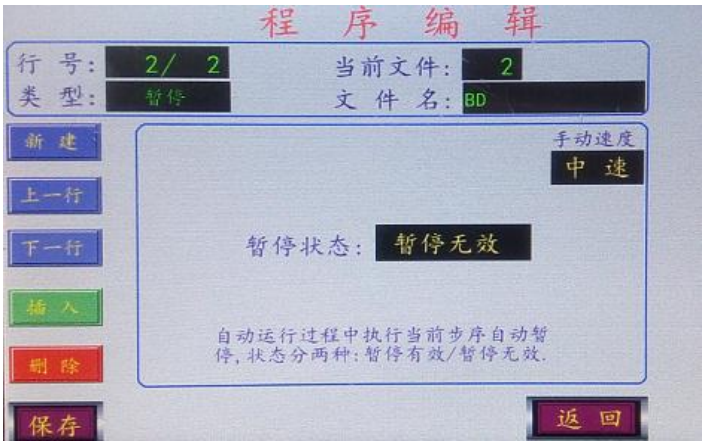
· Deceleration time …… time from the maximum speed to zero speed when principal axis stops.

· Test run……click “Test Run” for terminal winding after setting of parameters.

· Stop ……stop in test run.

· Return ……return to previous menu

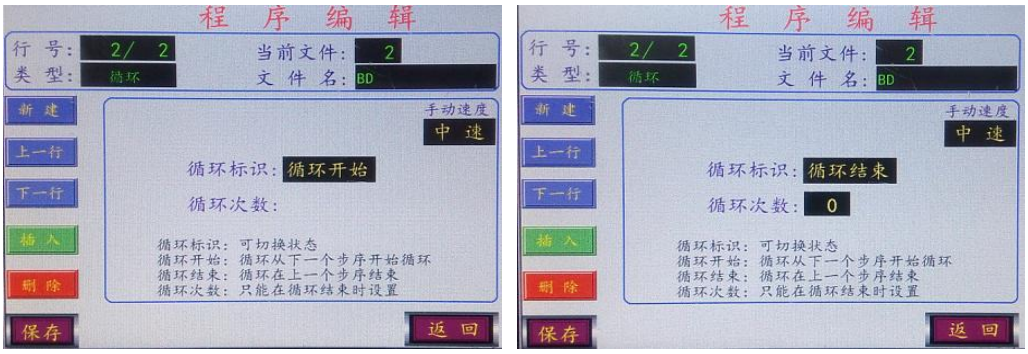
Pause instruction



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- State of pause …… state of pause falls into “effective pause” and “ineffective pause”. In case of effective pause, the machine will automatically pause in the current step in automatic operation; in case of ineffective pause, the machine will automatically run the following steps instead of pausing in the current step in automatic operation.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu

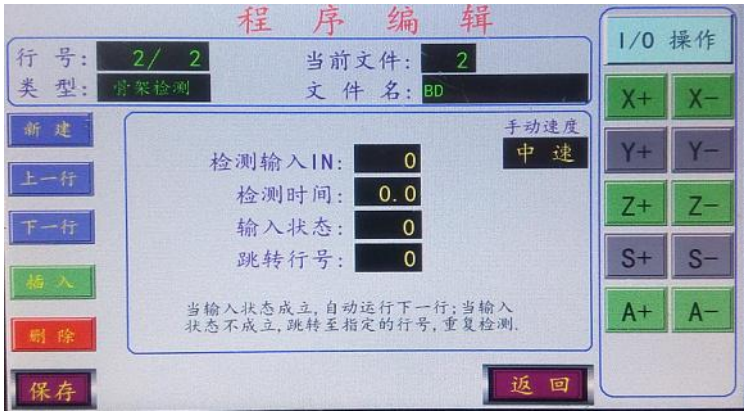
Cycle instruction



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Cycle identification …… use this instruction when repeating the step. Cycle identification is divided into “cycle start” and “cycle termination”. Insert “cycle start” into the line of step to be repeated, and insert “cycle termination” into the line of step to be terminated, and input cycle number. The next step instruction will be automatically executed after executing corresponding cycle number.
- Cycle number…… set times of repeating the step. Set value: 0, 1, 2, 3…
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu

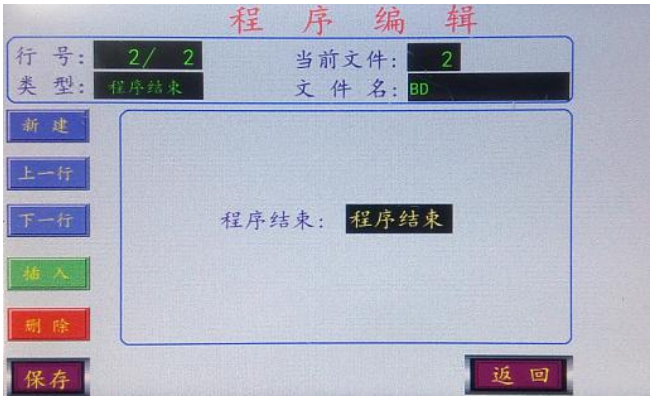
Instruction of bobbin test



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- Test input IN …… test input IN 23 (special signal).
- Test time …… time of signal discrimination.
- Input state …… judge whether signal is 0 or 1, generally 1.
- Skip of line number …… skip to the last line (moving coordinates of last line) when conditions are met.
- Manual speed ……manual movement speed of axes, low speed/medium speed/high speed are optional.
- Return ……return to previous menu
- I/O operation……switch to I/O state in edit state for I/O operation, and click “Return” to skip to the current line.
- X- / X +……leftward/rightward movement of X axis
- Y- / Y +……backward/forward movement of Y axis
- Z- / Z +……upward/downward movement of Z axis
- S- / S +……counterclockwise/clockwise rotation of principal axis
- A- /A+……backward/forward movement of trapper

Instruction of end of program



Operating instruction for function keys:

- Line number ……number of currently running step of program.
- Type …… program instruction at current step.
- Current file……code of program in operation.
- File name……name of program in operation.
- New …… instruction for establishing new program.
- Last line……return to the last program instruction.
- Next line……skip to the next program instruction.
- Insert ……insert a program instruction before the current program instruction.
- Delete …… delete step of current program.
- Save ……save the new or modified program.
- End of program …… use this instruction after the program is edited. This instruction is written in the last line of program or inserted in the middle. It will automatically skip to the first line after this instruction is executed.
- Return ……return to previous menu

4. Daily Operation of Equipment

4-1 Preparation for Input of Power Source

4-1-1 Confirmation of Power Source

Power voltage of this equipment: single phase AC220V±10%. Confirm that power voltage is within the above scope. If power voltage is unstable, operation of equipment will also be unstable, and major accidents may occur.

4-1-2 Confirmation of Air Pressure

Air pressure required for the equipment is 0.5Mpa±0.1Mpa. Please adjust the air pressure to the above scope before using the equipment. When air pressure is too low, the machine will be in an abnormal stopped state.

4-2 Input of Power Source

Turn on the green power switch on the right of equipment after confirming the above content.

4-3 Reset

Main air source must be turned on and reset of original point must be conducted before operation of equipment.
Press reset button to reset original point. The reset light will be on after reset.
When conditions for reset of original point are not met, the equipment will give an alarm and display content of alarm. Clear the alarm according to I/O list.

4-4 Start

Press starting switch to start the equipment after reset of original point.

4-4-1 Continous Operation and Single Step Operation

There is a key for switching continuous winding/single step on the bottom left of main screen.
Continuous winding: after pressing start button, the equipment will run from the beginning to the end. Continous winding is used in normal production.
Single step: press the start button once, the equipment will execute a step of operation according to the program. Single step operaiton is used in confirmation of program behaviros and equipment bebugging.

4-5 Abnormal Stop and Method of Reset

The equipment will be in abnormal stopped state in the following cases, where the equipment system returns to the initial state.

1. Press abnormal stop button.
2. Main air pressure is low.

The equipment returns to initial state in abnormal stopped state:

1. Main air tube and solenoid valve power off.
2. Interior of equipment returns to initial state.

5. Screen of Alarm Information

5-1 Description of Alarm

Figure 5-1 Main Screen of Alarm

In case of abnormity, the above screen of alarm will show alarm item with intermittent alarm sound.
Press STOP to clear the alarm after the problem is solved.

1. Cylinder interlocking

- Cause ・・・ motions of air cylinders that intervene each other are set in the program.
- Handling method ・・・ separately execute two or more air cylinders that are simultaneously actuated.

2. Principal axis is locked

- Cause ・・・ principal axis is locked or no input signal of transducer is detected when executing instruction for reset, winding or positioning of principal axis.
- Handling method ・・・ confirm air pressure, adjust main air pressure to the air pressure required for the equipment, and adjust position of transducer.

3. Alarm of emergency stop

- Cause ・・・ emergency stop switch is pressed.

- Handling method ・・・ turn the emergency stop button in direction of arrow to turn it off.

4. Servo alarm

- Cause ・・・ alarm of any of X/Y/Z/S axes.
- Handling method ・・・ confirm whether axes suffer from jamming or exceed limiting position. Press emergency stop switch or turn off the main power switch. Turn on the machine after about 10s. Check whether alarm is clear. Please inspect servo components and contact with the manufacturer if not.

5. Alarm for reaching set output

- Cause ・・・ alarm is given when current output reaches the set output
- Handling method ・・・ reset output or clear the current output.

6. Alarm for reaching low air pressure

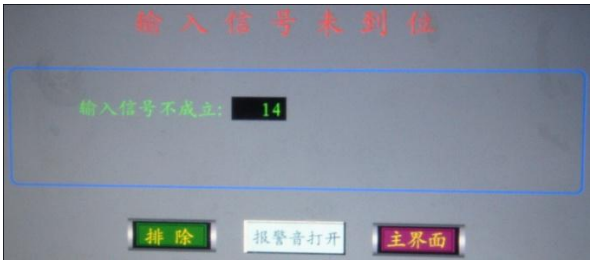
- Cause ・・・ alarm for low air pressure.
- Handling method ・・・ Handling method ・・confirm air pressure, and adjust main air pressure.

7. Disconnection alarm

- Cause ・・・ disconnection alarm is detected when executing instruction of winding.
- Handling method ・・・ replace the copper bobbin or readjust position of tensioner.

8. Input signal is not in place

- Cause ・・・ no designated input signal is detected when executing instruction of wait for input.
- Handling method ・・・ confirm air pressure, adjust main air pressure, confirm whether air cylinder is normal, position of transducer and program instruction are correct. Press “Clear” to clear the alarm after handling. If handled incorrectly, the alarm will not be cleared after pressing “Clear”. Press “Main Interface” to return to the home page, and press “STOP” to clear the alarm sound.



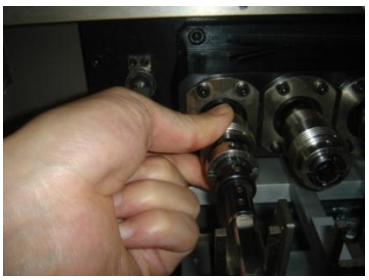
・ Other alarms will not be described here. Please contact with the

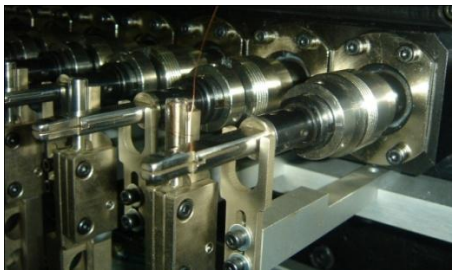
manufacturer if you have any question.

6. Equipment Adjustment

6-1 Replacement of Fixture

1. Push the taper sleeve backward to the rearmost end with hand or slotted screwdriver, grasp the front of fixture with the other hand to pull it out, and pull out axes 1-12 in order;

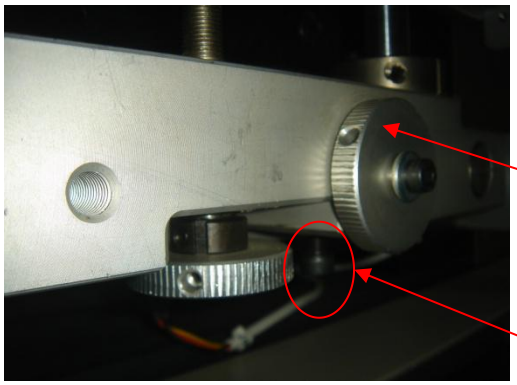




2. Install them with the same method. Note that the pin should be upward.

6-2 Front and Back Adjustment of Finger Mechanism

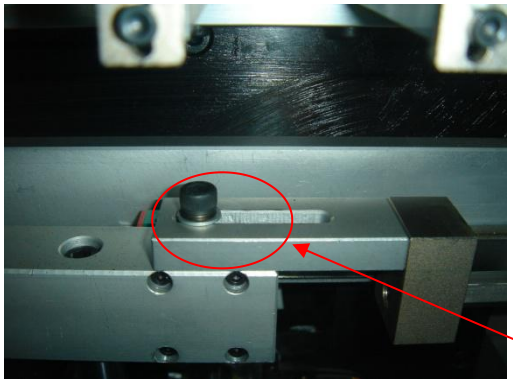
1. According to the size of product, length of fixture and process requirements for terminal winding, adjust front and back position of finger. Loosen locking bolts (M6) of front and back adjusting screw rods, turn adjusting handle. Adjust inward by turning clockwise and outward by turning counterclockwise.



2. Please lock the screws after adjustment.

6-3 Left and Right Adjustment of Finger Mechanism

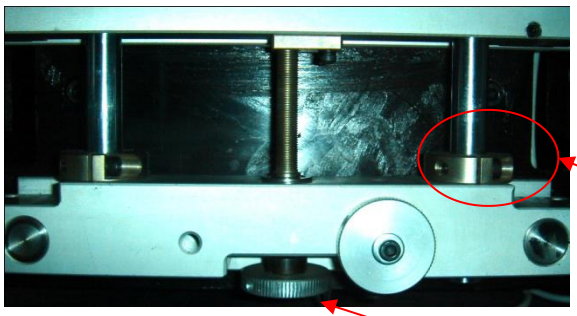
1. Adjust left and right position of finger according to swing diameter of the product to meet requirement for space of rotation and save copper wire in winding. Turn the finger mechanism to 180° through I/O operation. Loosen left and right locking screws (M6), and turn the finger mechanism to 0 °. Push the finger mechanism with hand from one side to the other, and adjust to the appropriate position as required.



2. Please lock the screws after adjustment.

6-4 Upward and Downward Adjustment of Finger Mechanism

1. Adjust the position of finger up and down according to size of product to meet requirement for position in terminal winding. Loosen locking screws (2-M5) of height limit sleeves at both ends, turn height adjusting handle, raise it clockwise and lower it counterclockwise. Adjust it to appropriate position as required.



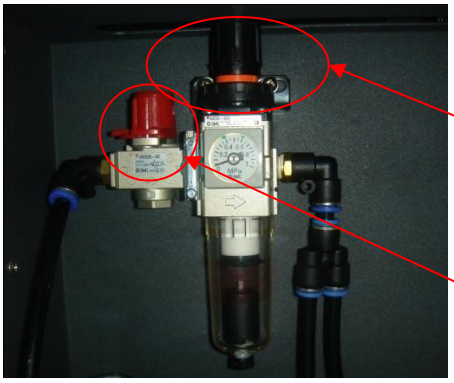
2. Please lock the screws after adjustment.

6-5 Adjustment of Finger Pressure

1. In order to effectively pull apart copper wire ends in terminal winding, the clamping force of finger must be accordingly adjusted (generally about 0.3～0.5) according to diameter of copper wire.

6-6 Adjustment of Main Air Pressure Valve

1. The main air pressure should be adjusted or closed during installation, debugging or repair of equipment. Specific operation is shown in the figure below.



7. I/O List

■ Input list:

IN01	Start	IN32	Pinch roller device up (original point)
IN02	Pause	IN33	Pinch roller device down
IN03	Reset	IN34	Cutting tool up (original point)
IN04	Stop (stop with screen)	IN35	Cutting tool down
IN05	Preset switch	IN36	Signal of finishing twisting of wires
IN06	Trapper backward (original point)	IN37	Functions of device for pressing wire
IN07	Trapper forward	IN38	Device for pressing wire up

			(original point)
IN08	Trapper 0°(original point)	IN39	Device for pressing wire down
IN09	Trapper 180°	IN40	Charging down (right)
IN10	Trapper left (original point)	IN41	Charging up
IN11	Trapper right	IN42	Charging right (original point)
IN12	Guide pin lever 0°(original point)	IN43	Charging left
IN13	Guide pin lever 90°	IN44	Functions of guide pin (for wire feeder)
IN14	Locking of principal axis (original point)	IN45	Test of belt door (short circuit)
IN15	Loosening of principal axis	IN46	Drawstring right
IN16	Blanking device backward (original point)	IN47	Drawstring left
IN17	Blanking device forward	IN48	Cutter forward
IN18	Hopper backward (original point)	IN49	Cutter backward
IN19	Hopper forward	IN50	Test of belt
IN20	Charging backward (original point)	IN51（ELB+）	Alarm of X axis
IN21	Charging forward	IN52（ELX-）	Prepare
IN22	Pressure switch	IN53（ELY+）	Alarm of Y axis
IN23	Bobbin float test	IN54（ELY-）	Safety hood
IN24	Disconnection alarm test	IN55（ELZ+）	Alarm of Z axis
IN25	Alarm input of X axis	IN56（ELZ-）	Completion bit of bobbin
IN26	Alarm input of Y axis	IN57（ELU+）	Alarm of S axis
IN27	Alarm input of Z axis	IN58（ELU-）	Upper material level of winding
IN28	Alarm input of S axis	IN59（ELA+）	Alarm of A axis
IN29	Functions of belting	IN60（ELA-）	
IN30	Belting (shears) up (original point)	IN61（ELB+）	Alarm of B axis
IN31	Belting (shears) down	IN62（ELB-）	Functions of finger belt

■ Output list:

O01	S axis SRV-ON	O23	Belting (shears) up/down
O02	XYZ axes SRV-ON	O24	Preset switch light
O03	Running light DC24V	O25	Belt tension (shears) OFF/ON
O04	Pause light DC24V	O26	Pinch roller device up/down
O05	Reset light DC24V	O27	Cutting tool up/down

O06	Back end of trapper (original point)	O28	Tightening/loosening of belt
O07	Front end of trapper	O29	Tension 2 ON/OFF
O08	Trapper 0°(original point)	O30	Trapper 3 ON
O09	Trapper 180°(original point)	O31	Trapper 3 OFF
O10	Guide pin lever 0°(original point)	O32	Trapper 4 ON
O11	Guide pin lever 90°	O33	Trapper 4 OFF
O12	Guide pin lever 0°(original point)	O34	Charging up/down
O13	Guide pin lever 45°	O35	Charging right/left
O14	Locking of principal axis (original point)	O36	Belt clip right/left
O15	Loosening of principal axis	O37	Belt clip ON/OFF
O16	Trapper left/right	O38	Prepare
O17	Trapper ON/OFF	O39	Prepare
O18	Blanking forward/backward	O40	Prepare
O19	Hopper forward/backward	O41	Prepare
O20	Charging forward/backward	O42	Prepare
O21	Tension 1 ON/OFF	O43	Prepare
O22	Start twister/device for pressing wire up/down	O44	Prepare

The above is standard model configuration. Any change will not be notified.