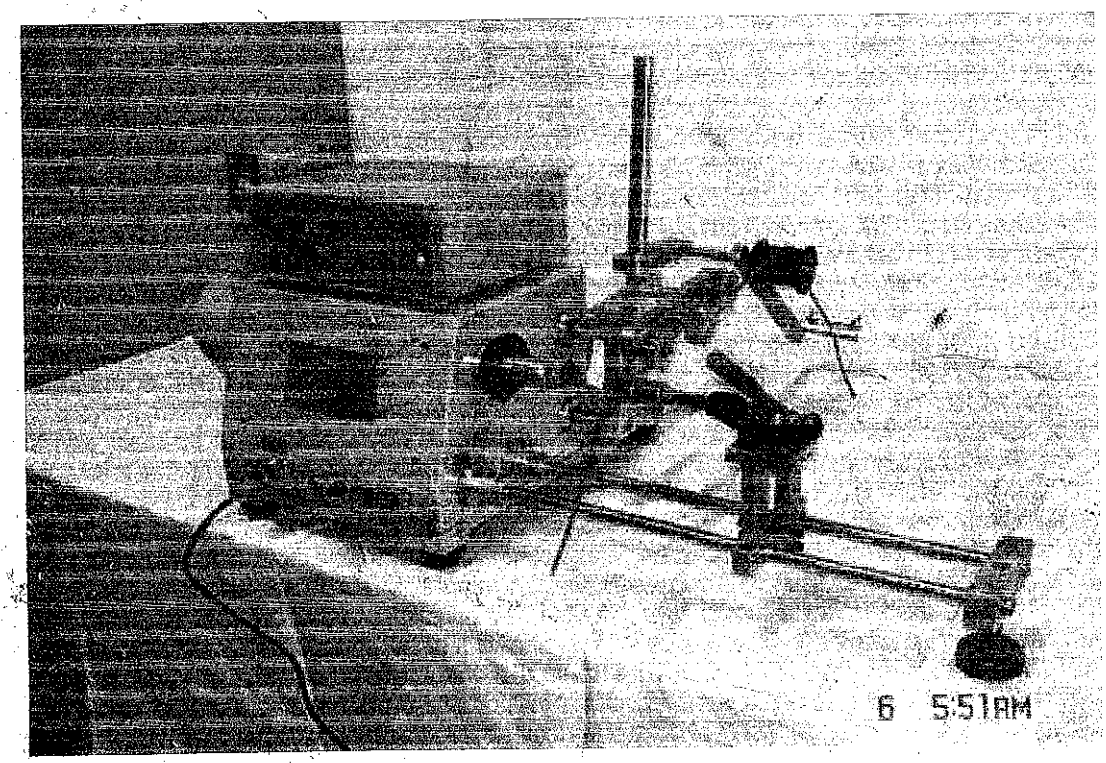
JLWTools CNC Winding Machine

User and Programming Manual

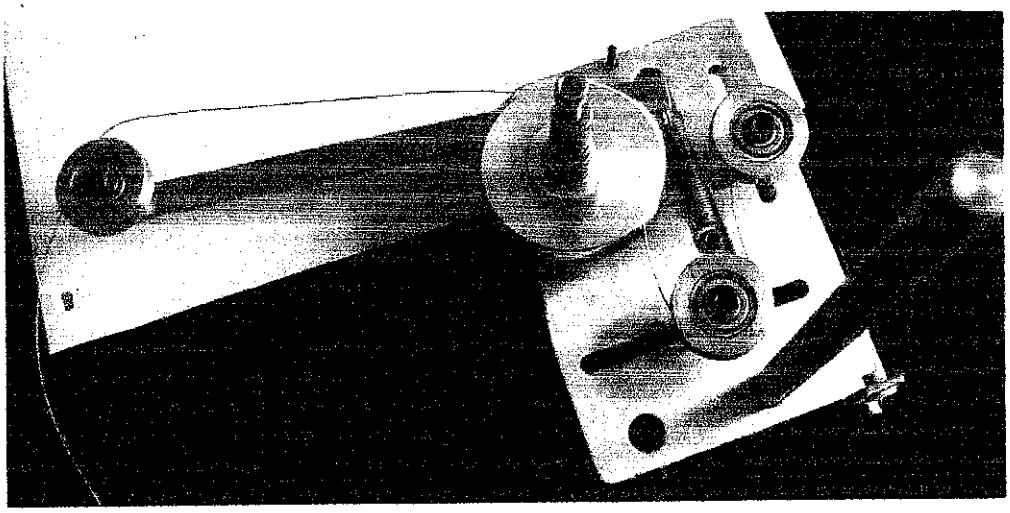
Version 1.2
2009

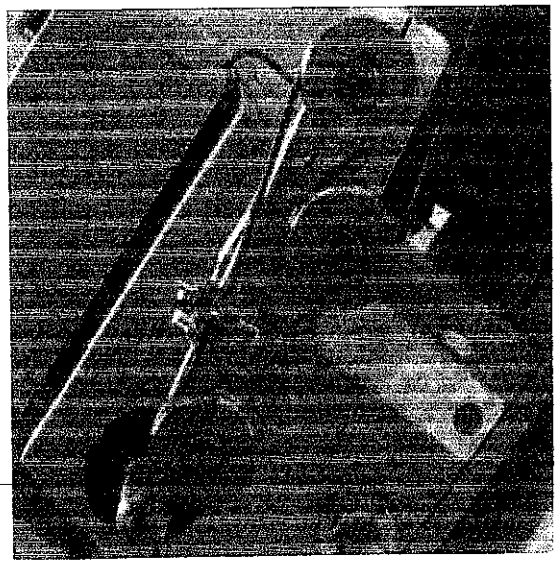
For Model: 301, 303, 305



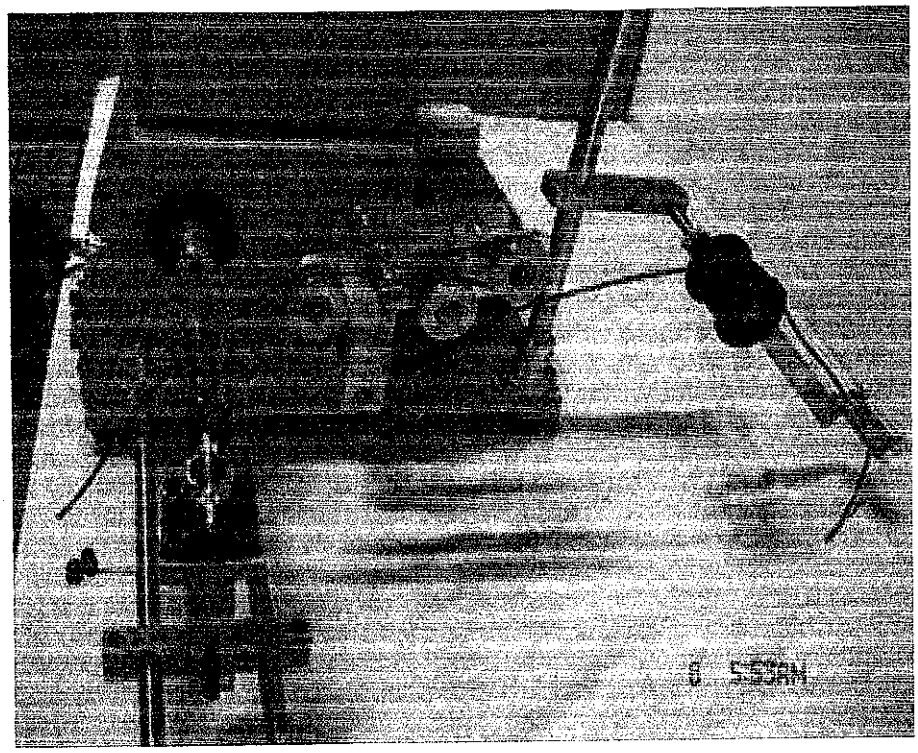
1. Installation, Wire loading

For the Heavy wire machine the tension unit wire (2 unit, optional) routing as below:





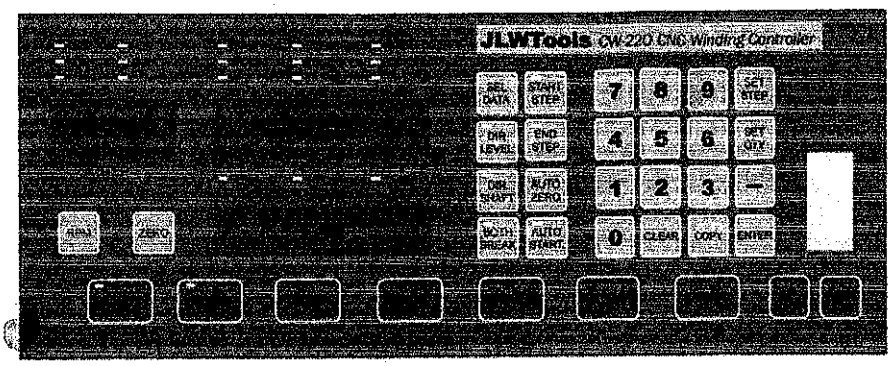
route on the wire Lead arm



Wire use without the tension unit (Tension unit is optional)

2. Front Panel Control

The front View of control Panel



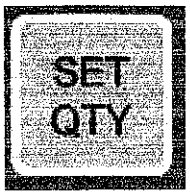
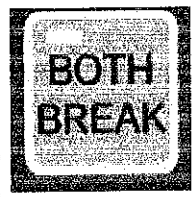
STEP WINDOW:
display the current programming step number
PRODCUTION WINDOW:
According to the above LED indication display the current RPM or PRODUCTION QTY
INFORMATION WINDOW: According to the above LED indication, window display the winding information and the programming step. During the operation, it display the Lead arm position or turns.

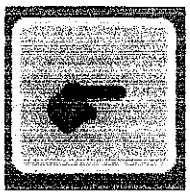
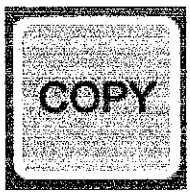
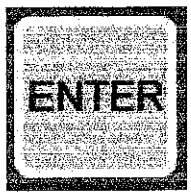
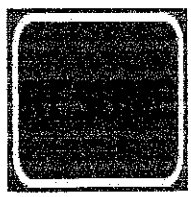
Machines Large button:
Green button: Start winding
Red Button: Stop the current winding, press the green button to resume
Orange Button: reset and go to the start of the current step.
Emergency Button: stop when you press, when anything goes wrong and you want to stop the machine. rotate and it release to resume.

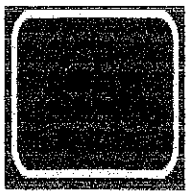
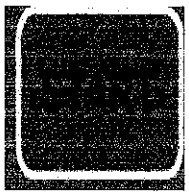
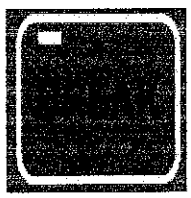
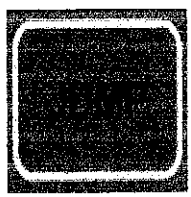
Foot switch: Start winding

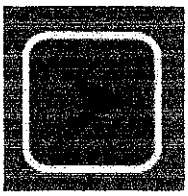
KEY Function Description

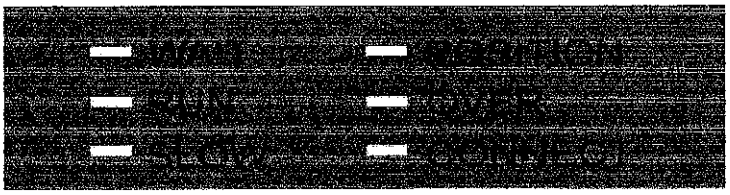
Key	Function
POWER	Power switch, turn ON will light up.
0-9	Total 10 key, for numeric input

	Enter the "date entry" mode
	Set the total production Qty.
	Press to show the START STEP in the memory
	In "Data Entry" mode, to select the information
	In "Data Entry" mode, to select the layer winding direction
	In "Data Entry" mode, toggle the "both end" break function
	To finished the memory programming.

	In "Data Entry" mode, select to toggle the Auto going to the initial position
	In "Data Entry" mode, select to toggle if the step auto or manual start
	In "Data Entry" mode, jump to previous step to edit
	In "Data Entry" mode, clear the number during edit
	In "Data Entry" mode, press to copy the previous step information to the current step.
	In "Data Entry" mode, press to save the date to current memory step location. This key will use very often, in programming mode, it will scroll the function and press to save the data.
	In any mode, reset the machine to the initial stage. RESUME back to the beginning of the assigned program start step

	During operation (machine winding) PUASE the operation.
	START or RESTART the operation from PAUSE.
	Toggle between the Winding spindle speed(RPM) and Production count information
	Reset the production count to zero
	Auto roll to next, LED light up means ACTIVE.
	When spindle stop, toggle to select BREAK or no BREAK. LED light up means ACTIVE.
	When PAUSE press, force the program goto NEXT step when RESUME

	When PAUSE press, force the program goto PREVIOUS step when RESUME.
	Move the wire lead arm manual to right, you can adjust the arm position in both program mode to preset the position, the display will show the numeric data and user can press enter to save the data(in START POS and WIDTH) or winding mode (when the winding in PAUSE) to adjust the position.
	Move the wire lead arm manual to left



The above show the status of the machine as following:

LED's	Function
WAIT	ON=Ready, FLASH=pause, OFF= programming/winding
RUN	ON= machine running
SLOW	ON= slow speed spindle
POSITION	The ARM return to the preset value

OVER	Spindle speed is over the limited
CONNECT	NOT USE
RPM	Press the PRM for display the spindle speed in RPM (turn per minutes) the LED indicated this is display for RPM
QTY	the LED indicated this is display for QTY
COMPLETED	Complete the preset production qty.

3. Programming the Unit

The winding Unit is able to store up to 999 steps in the machine memory, memory will retain even the main power is disconnected. User should view the transformer program by numbers of consecutive winding step. When user want to start to assign the winding machine to wind the transformer or coil,

1. User will just need to assign the start and end step.

Example a 4 layer winding, memory location at 1,2,3,4. so you need to tell the machine to start at step 1 and end at step 4.
Example of assign Start and End step. Start 1 to End 4, total 4 winding step, assume transformer has 4 layer.

To Assign the Start Step:

1. 

2. Enter the step number 0-999, this example is number 1.

3. Press 

to exit

To Assign the End Step:

1. 

2. Enter the step number 0-999, this example is 4.

3. Press 

to exit

if say, product need to change over to other winding job after this production, then just assign the start and stop step, say there is a transformer of 6 layer, at the memory location 100 to 106, you will use the above way to set the start step 100, end step 106. that's all.

This will allow a very quick set up of the machine ready for the winding job.

Following is a Step by Step instruction how to start the programming. Please follow it to get to understand the concept of the unit.

IMPORTANT PROGRAMMING CONCEPT:

1. you assign the start and stop step, this will allow the computer know the editable range you want to enter, say you want to program step 1 to step 3. you done about start step 1 , end step 3 already.
2. you press **SET-STEP** and then **ENTER.**
3. you can Press the **SEL-DATA to scroll through**

START POS ► WIDTH►WIRE DIA. ►TOT. TURNS ►START SLOW►STOP SLOW►HI-SPEED►LOW-SPEED► START POS

Enter the data by the nurmeric key pad and press the SEL-DATA for next data input. Also you can toggle following blue key option: DIR-LEVEL (winding direction), DIR_SHAFT (CCW or CW winding), both break (stop on each winding end), Auto Zero (going back to orign of each winding) and Auto Start (start without pressing the start button). When you are done, you can press the **SET-STEP** to exit the programming mode. Then press **START,** the machine will suppose to run according your programming data.

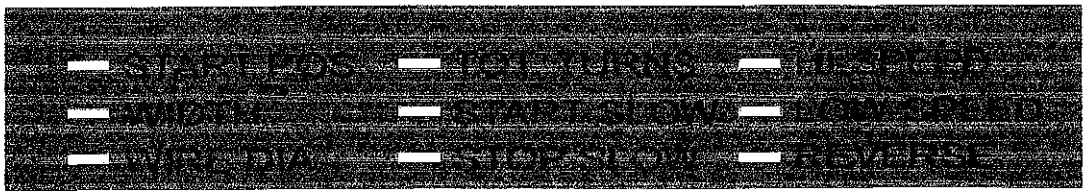
4. during any time of this, if you press **ENTER,** you will scroll between each step, say you are programming the step 1., and you press enter, it will bring you to step 2, if you press enter again, the unit will bring you to step 3, just press enter again then unit going back to step 1.
5. for single coil, you only need 1 step, just assign the start and stop step the same number, example start no.3 stop no.3, the machine will keep running this step.
6. if you press the Enter to exit the SET STEP, but display "**Err-1 or Err-2 or Err-3**", it means some setting, especially the width, start position is not correct so the unit unable to assign the step.

If you see the Err-1, Err2 on the display, please check the WIRE ARM LIMITED, the default is 180 (mm), This is the machine travel distance assignment and should be make sure it set at this value.

If you see the Err-3 on the display, please check the DIR LEVEL, if the direction of the travel arm is point to the different directly that ask the machine run beyond the limit, it will show this error code. Please set the DIR LEVEL and winding width, start position again to make a realistic programming assignment.

Programming the step can be start by pushing the **SET STEP button and then PRESS ENTER**, the first option will show "START POS." will be ready for program and show as a blinking light, please enter the number (0-100.00mm, check if it within the machine limited) and press ENTER, if you are just setting 1 start/stop step, the LED will light up to next position, in consecutive sequence as below, press the number to assign the data and enter to go next,

START POS ► WIDTH►WIRE DIA. ►TOT. TURNS ►START SLOW►STOP SLOW►HI-SPEED►LOW-SPEED► START POS



Exit the setting anytime by press the "SET STEP", if you see any Error

message (Err-?) on the LED display, it means your program had something that machine unable to perform the assign data.

If you had assigned more then one step, for example, your start step is 05 and end step is 10,
IF YOU PRESS ENTER

the **"START POS"** will remain, but the step will go from 05 to 06, if you press enter again, it will go to 07, 08, 09, 10, enter your data and press enter will go to next step which is 07, then 08, 09, 10.

After this, it will go to next setting, which is the **"WIDTH"**, which is also scroll from 05-10 then next setting. It's best for you to prepare the complete winding information before going to program the unit.

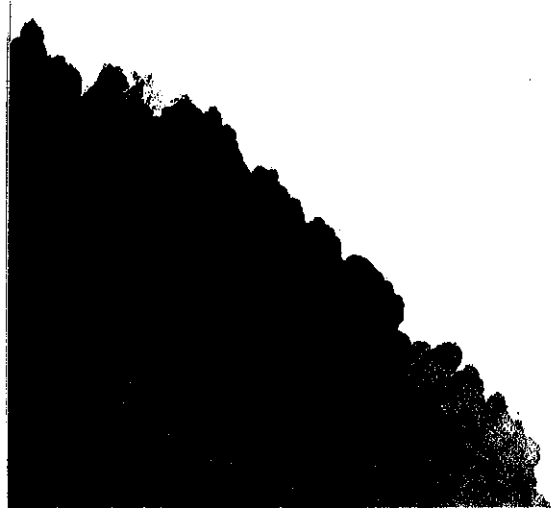
IF you don't like this setting the data of each Layer, you can press the SEL-DATA after you enter the data, the step will remain the same and it will scroll to the next data of the same step that you can enter.

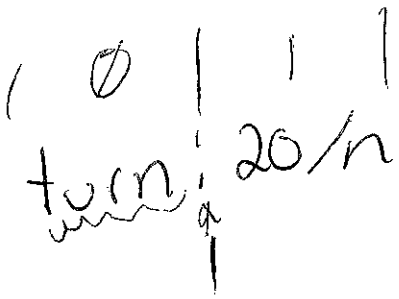
Enter the data when the LED light on the position which is blinking, you can enter the number (0-9, within the limited, excess limited will not accept by the machine) and press ENTER. Press ENTER again to scroll to next setting, to Exit the setting, pres "SET STEP" again.

Programming Limitation:

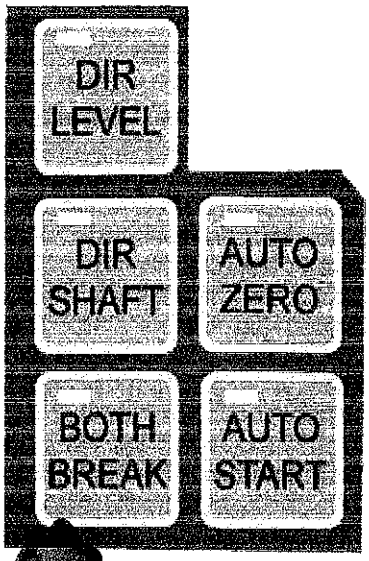
Data	**Description**	**Program Limited**
START POS.	Start Position	0-100mm, also can use the ◄► to set. If set this value to 999.99, it will remain the same value as previous step, This is useful for single winding with multi tap.
WIDTH	Winding width	0-160mm,also can use the ◄► to set. **Special function**: set this value to 0 will enable the "move 2 forward 1 backward" way to wind, the speed will calculated by the wire dia. And it move 2 dia. forward and 1 dia.

		backward.
WIRE DIA	Wire Diameter	0-9.999mm In some winding, there is not required the wire arm function, disable the wire arm by setting this valueto 0.
TOT TURNS	Total turns this step	1-99999
START SLOW	Slow start rate	0-6 (typical 1-5) this avoid sudden start motor at high speed will cause wire break
STOP SLOW	Slow stop rate	1.0-6 (Typical 1-3), the slow stop can allow better coil count and good tension at coil end.
HI-SPEED	High speed winding speed in percentage	20-99% (ex. If the maximum RPM of the machine is 5000 rpm and set at 80%, the speed will be 4000 rpm)
LOW-SPEED	Low speed winding speed in percentage	8-16%, During the operation of the winding, This speed preset is for the start and end winding slow speed. press the "0" will force the spindle run in the preset LOW-SPEED mode during winding. **CAUTION :** IF THIS VALUE SET TOO LOW (especially with heavy gauge wire and high tension load) the machine motor will stall and not turn, restart the machine and set to higher value.
REVERSE	This function not use	





5



Above 5 functions can be set at any time during the particular winding step in programming. Press on the button and LED light will light ON to indicated the function is active.

DIR LEVEL – forward or backward move on wire arm (can seee it as move to right or move to left)

DIR SHAFT- the Main shaft (shaft hold the bobbin) to turn clockwise ro counterclockwise.

BOTH BREAK- during the winding (for example a 5000 turn on the bobbin has 200mm width) it will stop the spindle each time when winding Arm move to both side of the winding with end (0, and 200mm),

AUTO-ZERO- the wire arm will move back to the start position, if not active, the arm only move back when press the START button.

AUTO-START- auto start the winding program step or wait for the START button switch press to start.

Speed Control:

There is 3 things you can do to change the maximum winding speed.

1. The hi speed setting, the number you enter is the percentage of the maximum speed of the VFD unit.
This is your most frequent use speed setting, this will give difference voltage to the VFD unit to change the range of 10~100% preset speed.

2. The VFD unit maximum speed can be set as following

A.Press the DSP/FUN Key, Unit will display "F00"
B. use the up/down arrow key to select the F06, which is the maximum speed of the motor
C. Press theDATA/ENT, the unit will display the current setting, which is 60 by default.
D. use the arrow key to change the value, for lower speed application, 30~40, for high speed application, up to 80.
E. Press theDATA/ENT again to save the data. wait 1 sec to return to "F06" display
F. Press the DSP/ENT key to exit the mode.
G. when the unit runing, the VFD will display the frequency of the system running

3. open the belt cover and change to lower ratio belt/pulley slot.
This will be your initial machine set up for suit your product type. example such as if you wind large wire diameter coil, you want to switch to lower gear ratio to have higher torque of the system.

you can always to check the RPM by press the RPM button, the LED will display the RPM reading

Production Count Setup
User can set the production counter by Press the

, then press the 0-9 number for total production, then ENTER.
The counter will accumulate one unit for each complete step start to end cycle.
Press ZERO for reset the counter to 0.

RESET ALL winding Data
To reset all winding data to zero, press the following:

"SEL DATA"►"CLEAR"►  ►"ENTER. All data in the memory will be clear to zero, do this with caution to avoid clear valuable data.

4. Option Setting

To set the option, press the following:

Press the 

, then 

, then Number (0-9).

Maximum WIRE ARM LIMITED Option

Press 'SEL STEP" ►"SEL DATA"► **"3"** This set the data (0-650) , the 650 means will not set any limited. The data also can be set by press the arrow key to moving the arm. If the arm run out of this limited during programming mode or operation, the unit will stop and show ERROR. Default is 180.00 (mm)

WIRE ARM position RESET Option

Press 'SEL STEP" ►"SEL DATA"► **"4"** This set the data (0-99), this will means how many unit of production to set before the machine to initial each arm position reset. Since the arm is driving by open loop stepping system, sometime the arm will miss count step and cause error, the reset will default and reset this error. Set to 0 means no RESET. Default is 5.

Set the SET-SETP, SEL-DATA, press 4 and enter 1. the 1 means the unit go back to the origin each time the winding complete, the 0 means never check it.

Maximum speed Option (this is for internal speed control unit, external speed control please use the VFD unit to set the speed)

Press 'SEL STEP" ▶"SEL DATA"▶ **"5"** This set the maximum spindle speed.

The unit will use this data to calculate the safe winding setting to avoid the wire lay down out of sync. For 301 unit, the separated speed control unit next to the programming unit allow user to set the speed control of the motor. Please refer to the speed control manual for programming the spindle motor maximum speed.

Break Option

Press 'SEL STEP" ▶"SEL DATA"▶ **"6"** This set the break time, the maximum time is [9.9]sec.

Set the SET-SETP, SEL-DATA, press 6 and enter 1~2. you can set the break time in Sec, from 0 ~9.9sec,

3. anytime the machine is not in winding, you can push the < or > and then Enter to set the origin of the winding.

Internal data Option

Remark: The Default option value of the machine is F00 –Top window 10120, lower window 10100. Please read completely about each function of the option before make any change.

Press 'SEL STEP" ►"SEL DATA"► **"0"** To enter the internal data set up

mode. The internal option require you to press the to enable EDIT status. After press and active the EDIT status, all the "decimal" on the display will light up. After edit all the option by using the key 0-8. press the "ENTER" to return the operation mode.

Internal option 5 4 3 2 1

Internal option X X 8 7 6

Press the number key 0-8 to scroll the option, for example, press the number "8" to scroll the option range from 0 to 4.

Option	Function	Setting
8 key	Start Mode	The operation start mode: 0 =single start, after start, use the foot switch need to be ALL PRESS DOWN to be ON, if release, it will OFF. 1=dual start, after start, press the foot switch ONCE means ON, and press again means STOP.

7 key	Measure system	0= MM shaft. Do not set this option
6 key	Turn Unit	0=0.1 turn count step , 1= 1 turn count.
5 key	Break Option	When unit run from high speed to low speed. 1 = for short break before low speed. 0 = for no break to low speed
4 key	Both end slow speed	When winding approach both end of winding width. 0= not slow down. 1 is slow down
3 key	Calculation mode	0= origin with absolute mode, 1 =no origin, relative mode.
2 key	Moving Ratio	Arm moving ratio, 1 =1:1, 2= 2:1, 4=4:1
1 key	Arm speed	The speed when the arm moving back to preset. 0= high speed, 1 = low speed.

ERROR Code.

- Memory Error, some information lost before unit turn off.
- I Starting position larger then the unit limited. Please check the SET-STEP, SET-SEL- 3,4 for correct setting
- when winding, the arm detect over the maximum limited.
- when winding, the arm detect over the zero limited.

Remark

1. The lower RED AUTO button. This will tell the machine to go back to the first step when the coil is finished and start again, this will be stop unit the STOP or AUTO key is press.

To clear up ALL the user winding information

1. you can press the SET-STEP > CLEAN > "-" > ENTER, this will clear up all the user winding information.

Winding Example:

This section will give some [illegible] of how to start your winding of some simple coil and transformer.

1) Wire width 32mm
2) Wire diameter 2mm
3) 200 turns, perfect lay - no step-back
4) Slow start, safe wind, slow stop. Fastest speed not essential.
5) 2 quantity
6) Assume a mandrel is fitted that requires a start position of 20mm in.

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