

**CNC aluminum profile bending
machine
LGW-CNC-13T**

Instruction manual



PREFACE

Thank you for using our production equipment, before you use the equipment, please spare some time to read the manual, so that your device is in the best running state, but also make your device to obtain the best economic benefit.

We sincerely hope that you in the process of using the equipment, the problems found and good suggestions timely feedback to us, so that we can better work in the future cooperation.

Thank you!

一、 **Main application and applicable scope:**

Use: Bending machine is used for irregular aluminum profile、 rectangular iron pipe bending, it is the decoration company, aluminum doors and windows company bending arc of the machine.

二、 **The machine features:**

1. The surface after bending is not deformed, without scratches or wrinkles, and the straight edges and arcs at both ends of the product can achieve uniform transition
2. Profile can be bent and formed at one time, and the efficiency is particularly high;
3. 100 bending formula can be saved (different profiles, radians and various parameters that have been saved), and can be used at any time;
4. colorful touch screen operation, imported industrial computer automation control, clear interface, easy and simple operation;
5. High circuit stability, great applicability to the working environment, and has automatic detection and diagnosis functions.
- 6, the profile curved arc mould is simple and practical, users can process it by themselves.

三、 **Equipment configuration**

- 1, Control system: Japanese "Panasonic" controller
- 2, AC servo system: ESTUN servo driver and servo motor
- 3, Operation screen: Taiwan weinview Touch Screen
4. Electrical components: Schneider, France
- 5, Speed reducer: China production
- 6, the transmission device: China production
- 7, mechanical parts: China production
- 8, The mould: our company processing (customer could make themselves)

四、 **The technical parameters**

Model: LGW-CNC-13T

Input power: 4.0KW

Voltage: 380V 50Hz 3 phase

Min. radius of bending:100mm (relate to profile)

Max. processing profile size:120mm*150mm

Spindle diameter:50mm

Y axis Hydraulic thrust:13T, max. 20 tons

Max torque of X axis:2500N.M

Rotation speed of shaft:1-15r/min

Y axis push rod repeat positioning accuracy: $\leq 0.01\text{mm}$

Total weight:900kg

Overall dimension:1500mm*1200mm*1400mm

五、 **Equipment installation**

1, environmental requirements:

The machine should be installed in a dry clean, non corrosive gas, temperature 15 ~ 35 degrees indoor hard cement ground.

2,The machine level adjustment:

By adjusting the bolt to adjust the bottom of the machine will be transferred to the horizontal position of the machine. Specific requirements are: three the pressure plate plane error is less than 1mm, the machine after adjusting the lock nut.

3, the machine is connected with the earth:

The machine must be based on the requirements of the electrical wiring diagram and the connecting line is connected to earth, soft copper wire, its cross-sectional area greater than 2.5 square mm, grounding resistance less than 4 ohm.

4, the machine power supply:

The machine input voltage: 380V 50HZ, connecting line for the soft copper wire, its cross-sectional area greater than 2.5 square mm (three-phase four wire).

六、 **Use and operation**

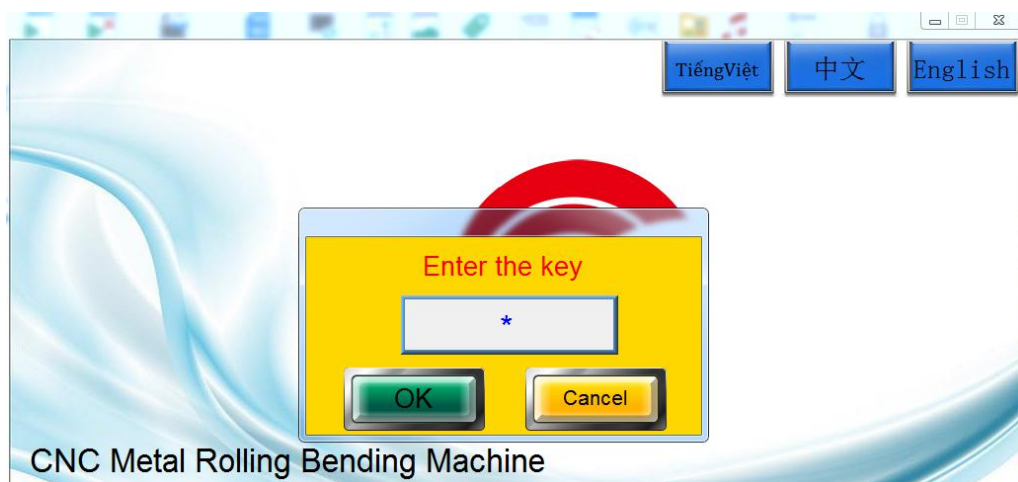
1,The machine is connected to the power

Confirm the machine properly connected, open the power switch, the machine electricity, operation screen appear as follows "the initial interface":

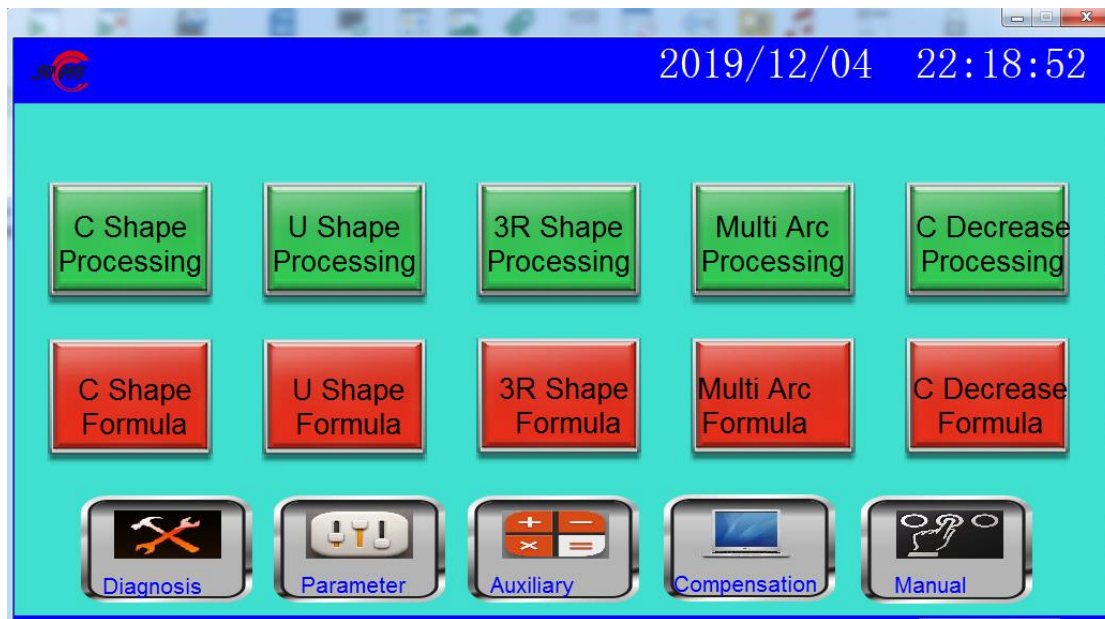


2, To enter the main interface

Press "ENGLISH" button in the initial screen, then press "INTO" key, the screen to enter the password input interface, as shown in:



In the "password" interface, click the password input box, enter the password "85761765", "the main interface of system":



In the main interface screen, click on each key, the operation panel is converted into a corresponding interface.

3, Manual operation

In the "Main interface", click "Manual operation" button, the system appears the following the manual operation interface:



In the "Manual" interface,

Click on the "Return" button, the system returns to the main interface

Click on the "←" or "→" arrow, can make the workpiece move to the left or right

Click on the "speed setting" , set the speed roller spindle rotation;

Click on the "up" or "down" arrow, the intermediate shaft move backward and forward;

Click on the "home" button, can make the intermediate roll back to zero position;

Enter the data of"move to" and press the "ok" key to move the middle wheel to the absolute position

Enter the data of"move" and press "OK" to move the middle wheel to the relative position.

The icon “backward limit” , “forward limit” and “origin” of this interface are the input signals of the Y-axis limit switch. Only when the limit switch is inductive, the icon display color will change.

4, The system parameters

In the main interface, click on the "Paramater" button, the screen to enter the "Parameter setting" interface, as shown in the following figure:



Cài đặt thông số		
Y Speed Setting		
Manual		0
Start		0
Forward Speed		0
Forward creeping		0
Backward Speed		0
Backing creeping		0
Reference Point		0
Action in Advance		
Forward deceleration		0.00
Backward deceleration		0.00
Forward Precision		0
Backward Precision		0
The others		
Auxiliary wheel diameter		0.00
Zero time Delay		0.0
Fixed wheel Spacing D0		350.00
X Zero Distance		0.00
Forward Soft Limit		0.00
Retreat distance		0.00
Retreat Sync Length		0.00
Rebound compensation		
Quay lại		

In the "Parameter setting" interface,click on the "Return" button, the system returns to the main interface

Each parameter interpretation:

Y speed setting:

"Manual" means that the speed of hydraulic cylinder to move the manual operation

"Start" said hydraulic cylinder move start speed

"forward speed" indicates the maximum speed of the cylinder when the cylinder is positioned forward

"forward creeping" means the speed of the cylinder after it has decelerated before moving to the target position

"Backward speed" indicates the maximum speed of the cylinder when the cylinder is positioned backwards

"Backward creeping" means the speed of the cylinder after it decelerates before moving to the target position

"reference point" means the speed of the oil cylinder's return after automatic processing is completed;

Action in advance:

“ Forward deceleration ” indicates the displacement of the cylinder after deceleration during the forward positioning of the cylinder during automatic processing;

"Backward deceleration" indicates the displacement of the cylinder after decelerating when the cylinder is positioned backward during automatic processing

"Forward precision" indicates the number of pulses sent by the deceleration system of the cylinder during the forward positioning of the cylinder during automatic processing;

"Backward precision" means the number of pulses sent by the deceleration system of the cylinder when the cylinder is positioned backward during automatic processing;

The others:

Auxiliary wheel diameter: The roller that moves with the curved profile, the accuracy of its diameter determines the dimensional accuracy of the profile position;

Zero time delay: the time for the spindle to rotate after the automatic processing is completed and the setback position is reversed;

Fixed wheel spacing D0: the distance between the left and right shafts;

X zero distance: the distance from the photoelectric sensor switch to the left axis;

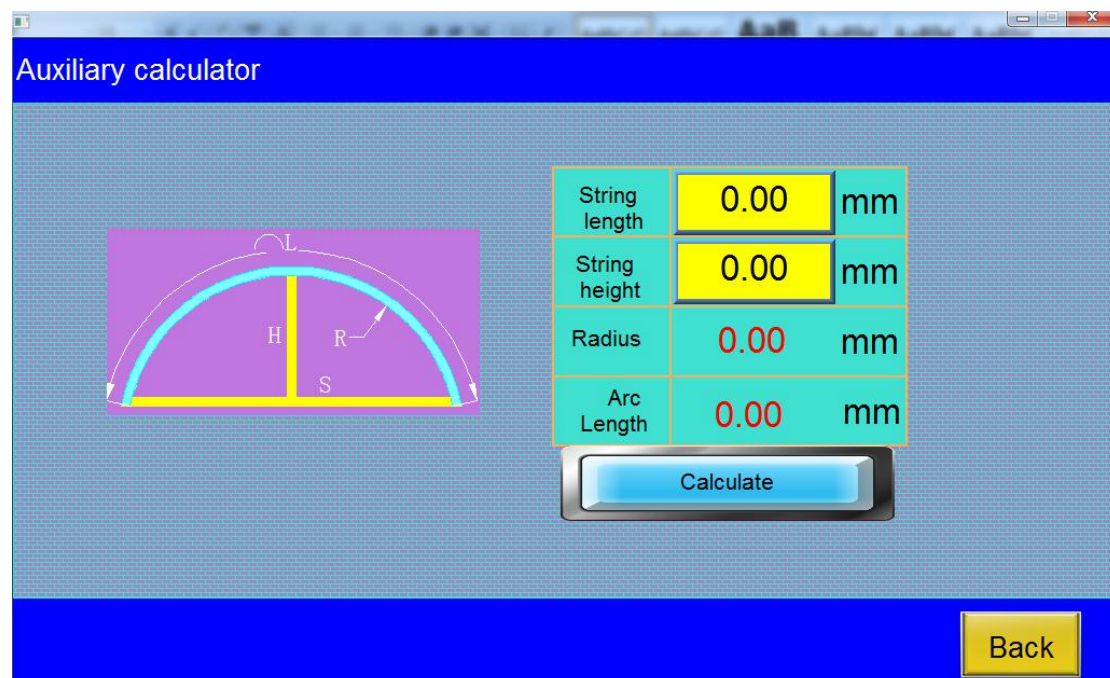
Forward soft limit: the amount of displacement from the Y axis to the forefront;

Retreat distance: After the automatic processing is completed, the distance that the moving wheel shaft retracts from the starting position;

Retreat sync length: After the automatic processing is completed, the Y-axis moves backward from the end position to the starting position, and the corresponding distance the workpiece moves in the discharge direction.

5, The auxiliary calculator

In the main interface, click on the " auxiliary " button, the screen to enter the " Auxiliary calculator " interface, as shown in the following figure:



String length	0.00	mm
String height	0.00	mm
Radius	0.00	mm
Arc Length	0.00	mm

"Calculate" is for easy radius calculation in actual use, the parameters of arc is encountered, through calculation, provide the basis for practical use;

Methods: the known length of chord "S",and arc height "H"

Calculate the radius parameter "R" and the arc length parameter "L"

6, Rebound calculator

"Rebound calculator" function is to correct the error by circular arc profile of the rebound coefficient modification,

because the profiles of different sizes, the hardness of the material is different, so the rebound coefficient profiles are also different, in the actual production process, the

rebound coefficient profiles for increase of bending radius increases, it is a linear relationship between the irregular.

The coefficient of restitution of the input is a empirical data, in the processing of the first workpiece, processing of the arc can not achieve the desired size, this needs to be calculated by the "Rebound calculator" features a new rebound coefficient, so that the processing of arc is more close to the demand.

In the main interface, click on the " Compensation " button, the screen to enter the " Rebound calculator " interface, as shown in the following figure:

Rebound calculator			
Target radius	0.00	Measurement radius	0.00
Fixed Wheel Radius RA	50.00	Old K0	0.000
<input type="button" value="Calculate"/>		New K1	0.000

The methods used are as follows:

- A、 Fixed wheel radius RA: the minimum radius of the fixed shaft mold
- B、 Fixed wheel spacing: 350mm or other data
- C、 The target radius: The radius of the circular arc needed
- D 、 The measurement radius : the measurement data of the radius measuring instrument

Enter the radius: Through the "Auxiliary calculation" to calculate the radius

- E、 Old parameter K0: rebound coefficient data In profile formula

The input is completed, click the "calculate" button, the system will automatically

calculate the new parameter K1, in profile formula interface, the parameter of K1 to replace the old K0 parameters, click on the "conserve" button, and then enter to automatic processing.

7, Signal monitoring

In the main interface, click on the " diagnosis " button, the screen to enter the " Diagnostic interface " interface, as shown in the following figure:

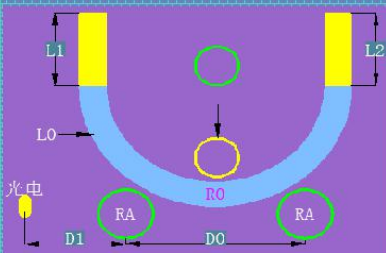


Through the "Diagnostic interface" interface can detect the input signal source (button, stop button, the grating ruler, rotary encoder) is normal, the output signal (solenoid valve, relay) is normal

8, C shape processing

select C formula corresponding to the automatic operation, in the main interface, click on the " C shape formula " button, the screen to enter the " C formula " interface, as shown in the following figure:

C Program Editor



Name:

Number:

Y Current Value:

Radius R0	<input type="text" value="500.0"/>	Fixed Wheel Radius RA	<input type="text" value="5.86"/>	Forward Sync Length	<input type="text" value="5.86"/>	<input type="button" value="Syms Manu"/>
Arc Length L0	<input type="text" value="1200.00"/>	Y Start Pos.	<input type="text" value="6.48"/>	Rebound compensation	<input type="text" value="1.588"/>	<input type="button" value="Rebound compensation"/>
Head L1	<input type="text" value="100.00"/>	Feeding No.	<input type="text" value="7"/>	Total Length	<input type="text" value="1400.0"/>	
Tail L2	<input type="text" value="100.00"/>	Unload Time	<input type="text" value="2.65"/>	Ending Pos.	<input type="text" value="56.07"/>	

In the "C shape editor" interface, press the "+" or "-" button, can obtain the corresponding formula, C shape processing can store 100 profile formula, in each profile formula, enter the profile name, arc radius, arc length, fixed wheel radius RA, rolling start position, rebound coefficient, etc. various parameters, press "save formula" key, the formula automatically save, press "back" key, return to the main interface, click on the "process" button, the screen switches to "C shape processing" at the interface, which can automatically process. can also be in the "C shape formula" interface press "Ent process" button to enter C shape automatic processing interface.

C Shape Processing 22:19:09

Number: Formula

Name:

Quantity: Clear

Radius R0	500.0
Arc Length L0	1200.00
Head L1	100.00
Tail L2	100.00
Y Start Pos.	6.48
Forward Sync Length	5.9
Fixed Wheel Radius RA	5.86
Feeding No.	<input type="text" value="7"/> <input type="text" value="0"/>
Total Length	1400.0

X Current Value	0.00
Y Current Value	0.00
Target Pos.	0.00
Ending Pos.	0.00
Ref. Speed	0.00 rpm
Working Speed	0.00 rpm

State Display

Ready → X Stop → Y Stop

Auto Start
Auto Stop
Back

C shape automatic processing steps: In "C shape processing" interface, press the "PUMP" button, hydraulic station start, loosen the nut, the workpiece is placed into the machine, press "AUTO start" button, the middle roller moves to the rolling start point, then tighten the nut (no need very tight, suitable is ok), Again press to the "AUTO start" button, the machine automatically start bending processing. Repeat the above process, can be produced in large quantities. once finished, press the "pump" button, the oil pump motor to stop, this time can turn off the power switch.

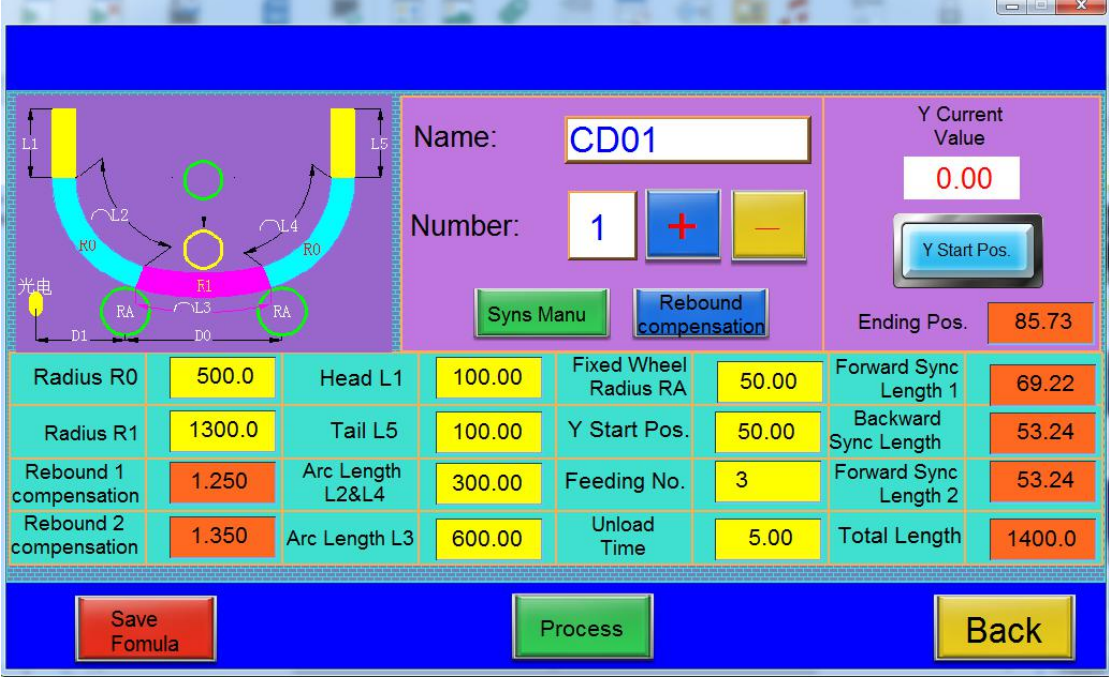
In "C shape processing" interface, you can set the find the reference speed and bending speed. (1~15r/min)

9.U-shaped processing

In the "Main Interface", press the "U-shaped formula" key, and the system enters the "U-shaped formula" interface:

In the "U-shaped recipe" interface, press the "+" or "-" key to call the corresponding recipe. U-shaped processing can store 100 profile formula. In each formula, enter the profile name, arc radius, Wheel radius, starting cylinder position, and other parameters. Press the "save formula" key, and the formula is automatically stored in the "U-shaped processing" interface. Press the "back" key to return to the "Main Interface" screen, and then press the "process" key, The screen changes to the

"U-shaped processing" interface, and it can be processed automatically.

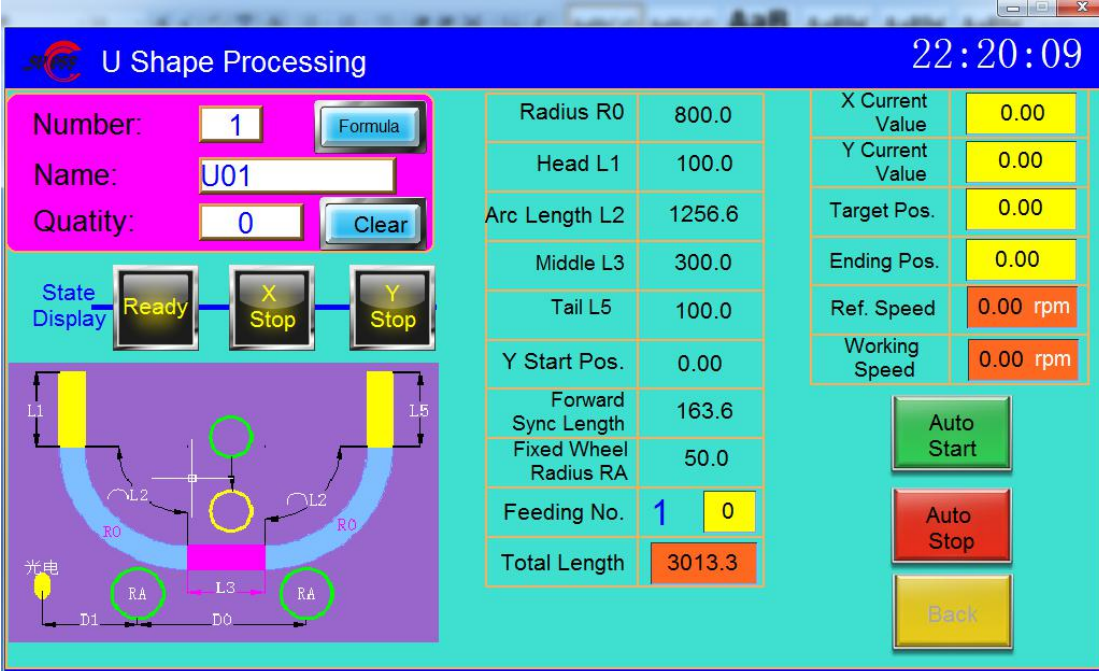


The interface displays a diagram of a U-shaped workpiece with various dimensions labeled: L1, L2, L3, L4, L5, L6, R0, R1, RA, D1, and D0. The diagram also shows a '光电' (photoelectric) sensor and a 'Rebound compensation' button.

Parameters and values:

Name:	CD01		
Number:	1	+	-
Y Current Value	0.00		
Y Start Pos.	85.73		
Radius R0	500.0	Head L1	100.00
Radius R1	1300.0	Tail L5	100.00
Rebound 1 compensation	1.250	Arc Length L2&L4	300.00
Rebound 2 compensation	1.350	Arc Length L3	600.00
Fixed Wheel Radius RA	50.00	Feeding No.	3
Forward Sync Length 1	69.22	Unload Time	5.00
Backward Sync Length	53.24	Total Length	1400.0

Buttons: Save Formula, Process, Back.



The interface displays a diagram of a U-shaped workpiece with various dimensions labeled: L1, L2, L3, L4, L5, L6, R0, R1, RA, D1, and D0. The diagram also shows a '光电' (photoelectric) sensor and a 'Rebound compensation' button.

Parameters and values:

Radius R0	800.0	X Current Value	0.00
Head L1	100.0	Y Current Value	0.00
Arc Length L2	1256.6	Target Pos.	0.00
Middle L3	300.0	Ending Pos.	0.00
Tail L5	100.0	Ref. Speed	0.00 rpm
Y Start Pos.	0.00	Working Speed	0.00 rpm
Forward Sync Length	163.6		
Fixed Wheel Radius RA	50.0		
Feeding No.	1 0		
Total Length	3013.3		

Buttons: Auto Start, Auto Stop, Back.

U shape automatic processing steps: In "U shape processing" interface, press the "PUMP" button, hydraulic station start, loosen the nut, the workpiece is placed into the machine, press "AUTO start" button, the middle roller moves to the rolling start point, then tighten the nut (no need very tight, suitable is ok), Again press to the "AUTO start" button, the machine automatically start bending processing. Repeat the

above process, can be produced in large quantities. once finished, press the "pump" button, the oil pump motor to stop, this time can turn off the power switch.

In "U shape processing" interface, you can set the find the reference speed and bending speed.

10、3R shape processing

In the "Main Interface", press the "3R shape formula" key, and the system enters the "3R shaped formula" interface:

In the "3R shaped recipe" interface, press the "+" or "-" key to call the corresponding recipe. 3R shaped processing can store 100 profile formula. In each formula, enter the profile name, arc radius, Wheel radius, starting cylinder position, and other parameters. Press the "save formula" key, and the formula is automatically stored in the "3R shaped processing" interface. Press the "back" key to return to the "Main Interface" screen, and then press the "process" key , The screen changes to the "3R shaped processing" interface, and it can be processed automatically.



3R shape automatic processing steps: In "3R shape processing" interface, press the "PUMP" button, hydraulic station start, loosen the nut, the workpiece is placed into the machine, press "AUTO start" button, the middle roller moves to the rolling start point, then tighten the nut(no need very tight, suitable is ok), Again press to the

"AUTO start" button, the machine automatically start bending processing. Repeat the above process, can be produced in large quantities. once finished, press the "pump" button, the oil pump motor to stop, this time can turn off the power switch.

In "3R shape processing" interface, you can set the find the reference speed and bending speed.

七. Maintenance

In order to keep the arc bending machine working continuously, reliably reduce the damage of the parts, and extend the service life, the maintenance system of the arc bending machine must be implemented.

1. Daily maintenance: once every shift.

1.1 Check the tightening bolts and nuts everywhere.

1.2 Check the connection of various agencies. If there is any abnormality, it should be cleared. Lubricates horizontal slide rails and retractable universal joints.

1.3 Check the electrical system: After turning on the power, check the rotation direction and operation of the motor.

1.4 Keep the arc bender tidy and clean the dirt inside the arc bender frequently.

1.5 The hydraulic oil (46 # wear-resistant) in the hydraulic station is replaced every six months.

2, technical maintenance: check the mould to ensure that the mould is intact without damage.