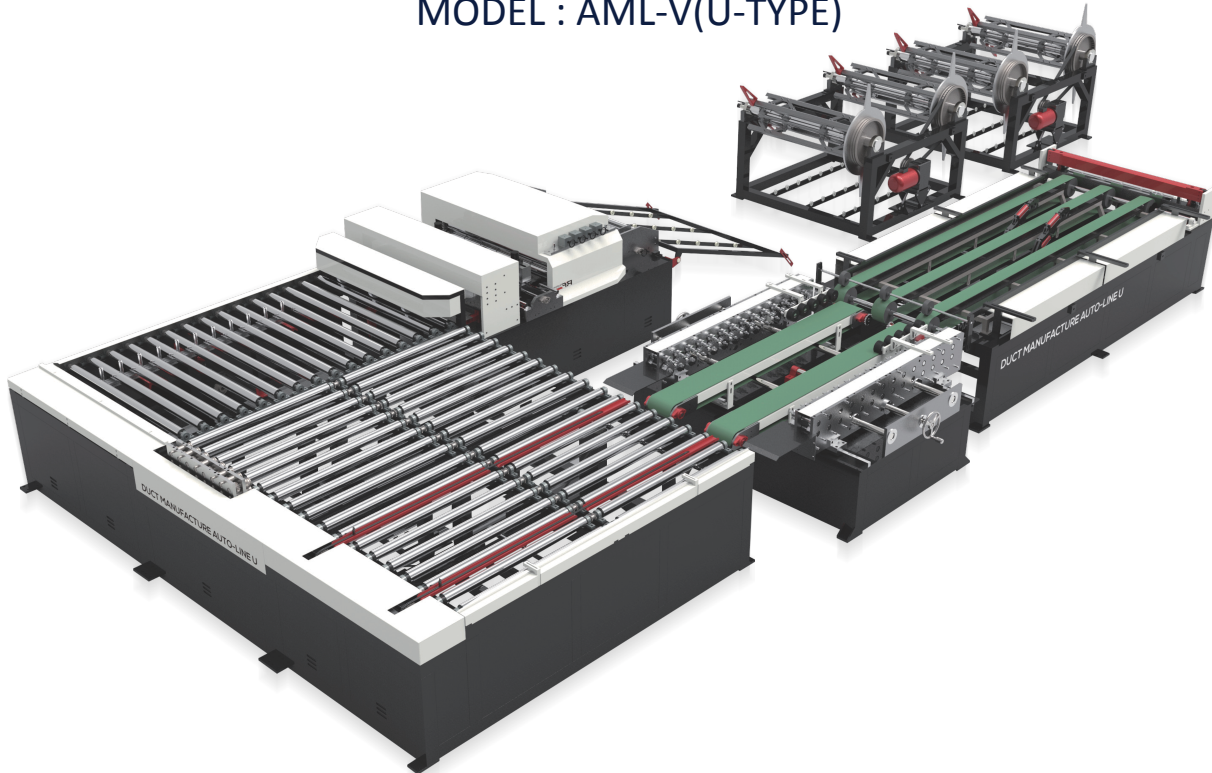




AUTO LINE MACHINE MODEL : AML-V(U-TYPE)



A. The main purpose of the equipment, performance and features

Duct U-automatic production line is one of the achievements of our company based on customer requirements, carefully study engineering and technical personnel of exploration, mainly used for the production of rectangular duct, from coil to end product of duct, fully automated production; advanced technology, high production efficiency also applies to fixed length cutting sheet metal, cabinets and appliances, automobiles, elevators, and other light industry. The entire production line by the decoiler, leveling and grooving parts, notching parts, shearing parts, 1# transport table, lockform parts, 2# transport table, flange forming parts, After servo Extraman with folding table etc. (see equipment layout and process). This production line is simple, stable performance, accurate cutting control the size and other characteristics.

Use this production line making duct, in addition to the standard TDF flange produced, and also has the following characteristics :

1. Can be used to fixed length cutting sheet metal ;
2. Can be in the notching position add the punching part (Need to specify in the contract and the need to pay extra)
3. Can be in the lockform position add the snap lock seam & cam standing seam (need to specify in the contract and the need to pay extra)
4. Can be according to the customer request to change the TDF flange to : PDF20/25/30/35/40(the profile same TDC flange) Formtek flange (need to specify in the contract and the need to pay extra)
5. Used the world-renowned CNC, hydraulic control system, so that the whole system is stable, improve the accuracy of processing.
6. Customers are free to choose a variety of configurations combined into production lines to meet different requirements, automatic duct production line standard models are: A type and B type.

B. The basic parameters of the equipment, process flow



A) Basic parameters :

Capacity of the steel material	Thickness t (mm)		0.5~1.2 (G.I and M.S)	
	Galvanized sheet standards		GB/T2518-2008	
	Width W (mm)		1000~1250 (A type)	1220~1530 (B type)
	Length L (mm)		600~2500	
Coil number of specifications	Each coil weight (tons)		6	
	Internal diameter (mm)		508	
	External diameter (mm)		≤1300	
	Can be loading the QTY(coil)		4	
Production efficiency	Leveling speed (m/min)		≤15	
	The speed of make L type		Depending on the duct size may be	
	The speed of make □ type		Depending on the duct size may be	
Cutting precision	Length tolerance (mm/m)		±0.5	
	Diagonal tolerance (mm/m)		±0.8	
Bending precision	Bending tolerance (mm/m)		±1	
	Angle tolerance		±5°	
Duct processing capacity	Flange forming size (mm)	Angle flange	7-9	
		TDF flange	35/33	
		Seam lock	12	
	Pittsburgh (mm)		30	
	Min. Duct cross-section (mm ²)	L type	150×150	
□ type		300×300 (t=0.5~1.0)		

Remark :

1. L type、□ type when the last bending, the bending length must be ≥160mm;
2. When the thickness =1.0~1.2 ; □ type we recommend cross-sectional dimension ≥250×250mm², that take the product will be easy
3. Forming part of the entire line, and do different thickness required for the device adjusted accordingly.

B) Process flow



Decoiler—Material support—Feeding—Leveling & grooving—Notching square, notching tapering—Shearing —Transport table—Pittsburgh seam lock—Transport table—Rollforming Flange—Servo feeding—Bending product

C. Work environment requirements

- 1) Not more than 3000 meters above sea level ;
- 2) Ambient temperature : -5°C~+40°C ;
- 3) Relative humidity : 20%~80% ;
- 4) Atmospheric conditions: Do not have thunderstorms erosion and cause an explosion, metal corrosion and damage the insulation of medium (gas and dust, etc.);
- 5) Main power: AC380V ± 10% Frequency: 50Hz
- 6) Working height : 930mm
- 7) Machine weight, power and dimensions :

Mould		Weight(t)	Dia (l×w×h) (m)	Power (kw)
A TYPE	ALV13 (W=1000~1250)	≈20	12×4.7×1.6	20
B TYPE	ALV16 (W=1220~1530)	≈23.5	12×6.1×1.6	20

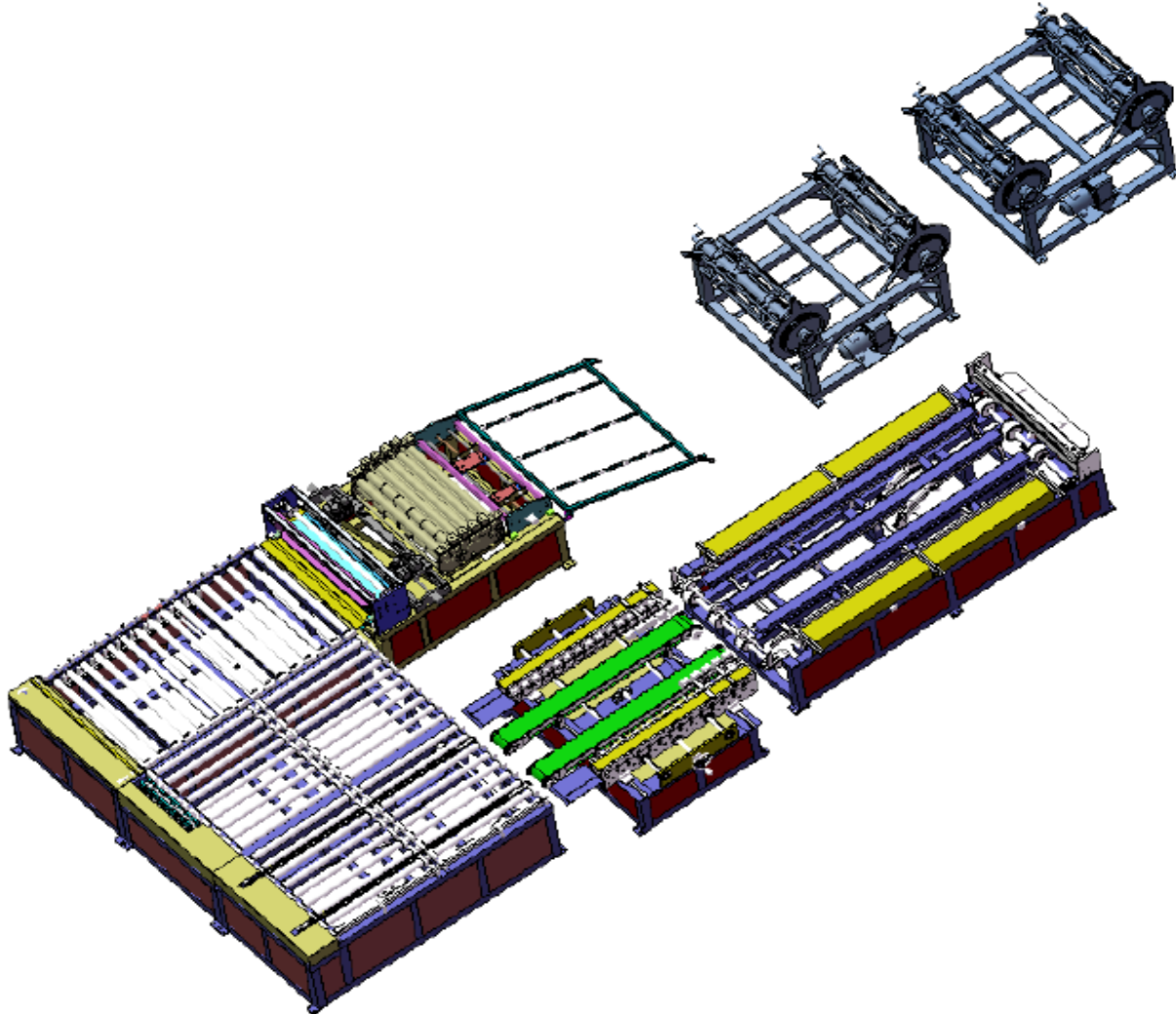
D. Configuration and structure of the apparatus

A) The main configuration of ALV duct line (its shape structure see Figure A) :

main configuration		Mould		
		A type	B type	REMARK
Decoiler		•	•	
Leveling & grooving parts		•	•	
Notching parts		•	•	
Shearing parts		•	•	
Transport table		•	•	
Pittsburgh seam lock		•	•	
Servo Transport table		•	•	
Flange rollforming	C & S Flange			Can be add other flange or change the TDF flange
	TDF Flange	•	•	
	PDF Flange			
Servo feeding table		•	•	



Hydraulic bending parts	•	•	
Pneumatic system	•	•	
Hydraulic system	•	•	
Electrical system	•	•	



B) A detailed description of each function configuration :

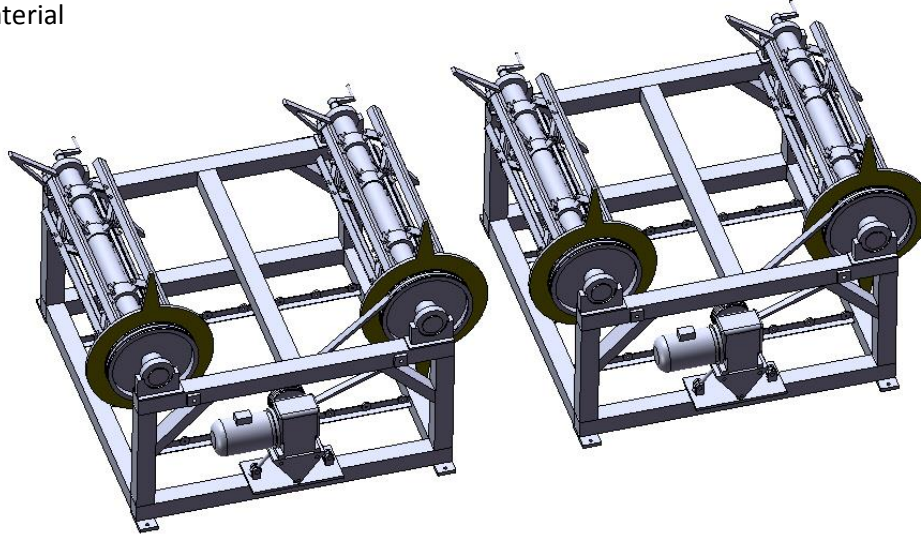
1. DECOILER : (Expansionary decoiler)

Expansionary decoiler :

Onedecoiler can be loading 2coilmaterials, single coilweight maximum of 6 tons. The coil shaft with 45 # steel, processed after quenching and tempering is made with sufficient strength and rigidity. Frame with square tube and channel steel welded group, after aging treatment, thus ensuring the stability during use. Adjustable roll support structure,adjustment range $\Phi 460 \sim \Phi 630$ mm. The discharge planes equipped with 2.2Kw motor through worm gear unit driven by the control circuit, to achieve automatic



control discharge, retreat materials and jog feed function, the sheet surface played a very good protection, avoid the phenomenon generally discharge machine edge material damage. Users refueling discharge axis as long as the discharge from the shelves as a whole hanging down, roll into the core to be used in artificial tension reel, reel to complete the placement, the simple operation, ease of refueling. Put the rack sub-feeder for multiple reel production of the occasion; do use classification, convenient transport material



2. Leveling & grooving parts :

Use ratio of 29: 1 power 2.2KW servo motor driven cycloid reducer, its speed 0 ~ 1450r / min, the torque 20N / m;

The first shaft is feeding rollers, the upper shaft is Rubber covered roll, ensure the feeding process does not slip, and also to ensure the outer surface without damaging the sheet metal; I followed by 5leveling roll (2 shafton and under 3 shaft) ; one set of grooving rollers, can be simultaneously bending 5 bars the grooving,the grooving profile same the U, bars spacing 5 × 210mm (ALV1300) / 6 × 230mm (ALV1600), one pair of distance rollers all rollers work hard outer surfaces by plating chrome, which is durable and ensures the outer surface is not damaged sheet metal.

The leveler grooving rollers is adjusted to the two ends of a common drive shaft worm gear drive, in the adjustment process to ensure the synchronization and avoid the occurrence of run feed roller at both ends.

3. Notching parts :

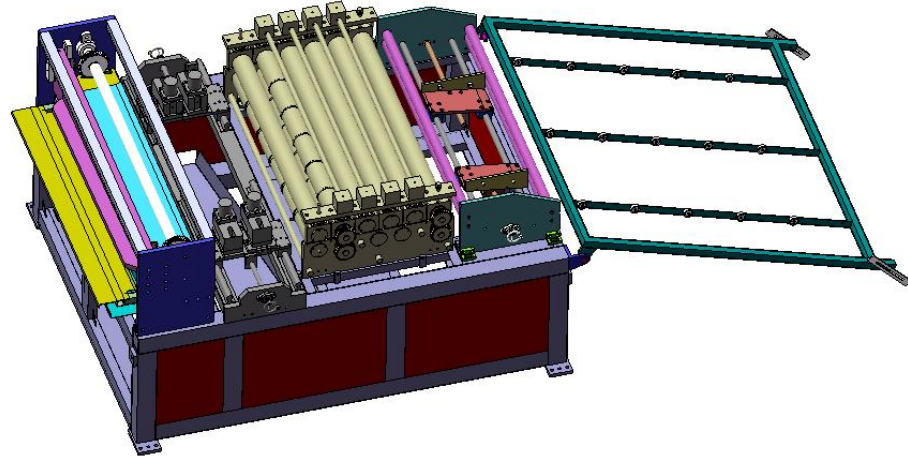
Can be notching square (30mm) and notching tapering (3mm) , total 2 sets notching dies(4 PCS). Each die by a bore 63mm, 30mm stroke cylinder drive, adjust by turning the screw to achieve shear angle plates of different widths and depths of cut corners; and upper and lower dies very easy to replace them, require different punching the angle and shape, just replace the upper and lower molds can be.



4. Shearing parts

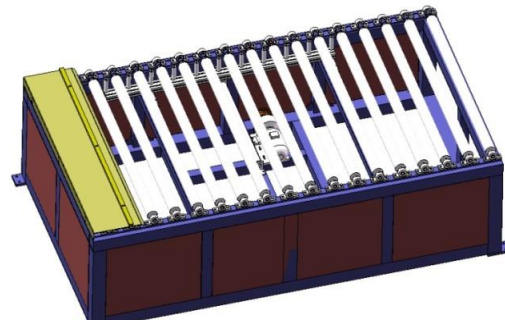
Hydraulic guillotine shears. By two bore 63mm; 65mm stroke cylinder to perform a cut, in order to ensure the synchronization of both ends of the gate cutting action of two cylinders, using a synchronized axis by rack and pinion to be guaranteed. Up and down the scissors made of high quality alloy tool steel

Cr12MnV, heat treatment and finishing from the strict, sharp edge, durable, cut out high precision workpiece size and no curling, no burr.



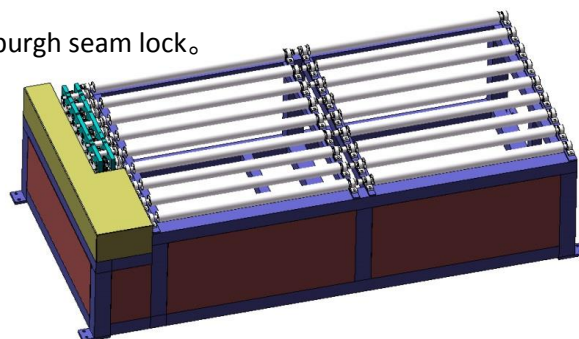
5. Transport table :

Machine with roller conveyor and extraman feeding structure. Achieve lateral feed, when feeding to third group ofPittsburgh seam lock,the feeding device automatically returns to zero at the wait for the next sheet. S304 stainless steel cylinder with made to ensure that galvanized sheet surface layer is not scratched. Pittsburgh seam lockthe roller use GCr15 materials.



6. Pittsburgh seam lock parts :

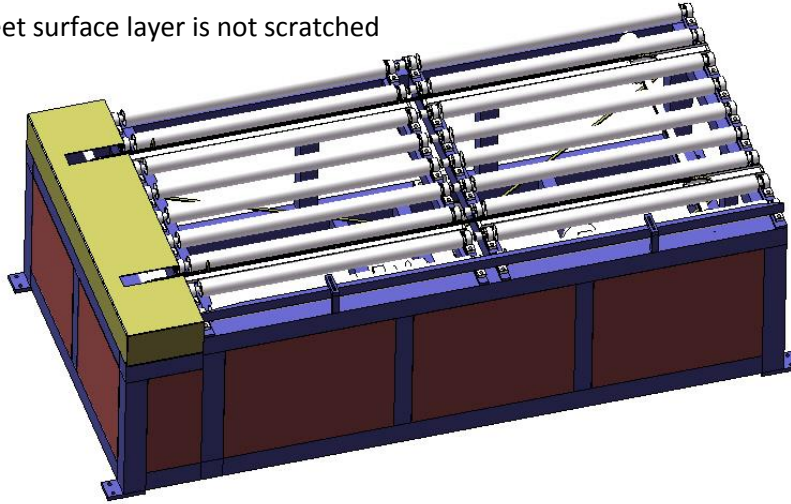
Use fixed Pittsburgh seam lock.





7. Flange Transport table :

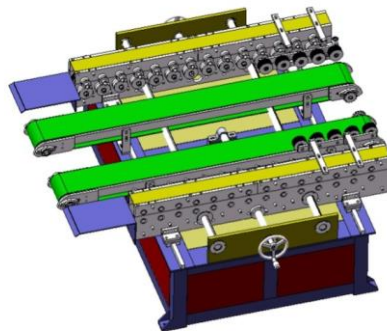
After Pittsburgh seam lock, transported by the rollers to a total of flange area to be expected, after the photoelectric switch to the electrical system signal to start the pusher robot a smooth push plate conveying to flange plate molding machine. Pusher robot double chain pusher device to ensure reliable push sheet parallel to flange plate molding machine. S304 # stainless steel cylinder with made to ensure that galvanized sheet surface layer is not scratched



8. TDF Flange rollformong parts :

The two flange independent motor control, using linear guide precision guided movement, can be adapted to different widths of the specifications sheet cold roll forming. Middle with two conveyor belts care feeding, the main motor drive cycloid reducer drive the two sides of cold-rolled rod achieve speed synchronization.

a. TDF flange: forming roll by the symmetry of the two sets of 14 sets of roll components. Roll made of high quality alloy steel, heat treated, CNC lathes from roll hardness up to 58 ~ 62HRC, forming width adjustable, both sides share a set of roller drive system to achieve synchronization.



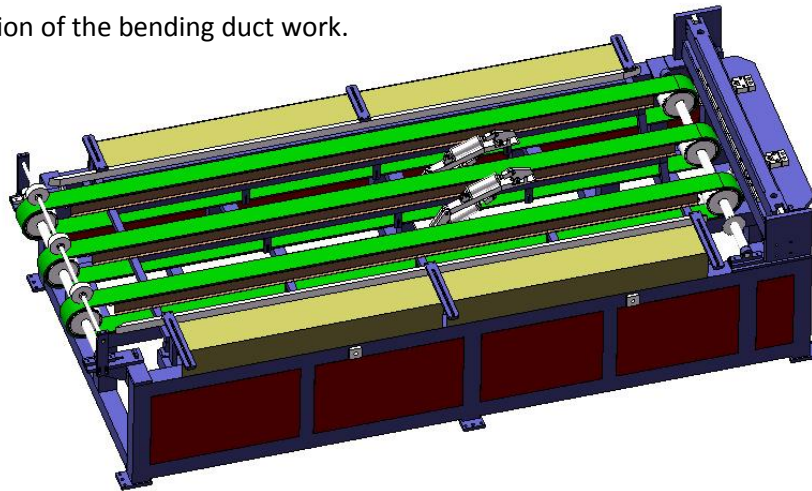


9. Servo transport table :

Fixed frame, belt drive and servo system. servo system consists of high-precision linear rails, servo motor, reducer composition. After the sheet forming the flange means forming the flange by the belt into the servo feed platform, clamp the material manipulator system to stop at a pre-set a good position (this position is set according to the size of the duct diameter produced), is sent to the sheet by the conveyor belt behind the folding machine, when the sheet reaches the folding machine positioned on the proximity switch a sensing signal to the control system, the robot rose at the lift cylinder pushing, while the servo motor starts fast forward to catch up sheet, when mechanical hand contact switch across the sheet back side, robot gripping sheet according to preset parameters step forward feeding and folding work.

10. Bending parts :

Use lower beam is fixed on a sliding beam to achieve compression, the compression is done by two $\Phi 63 \times 30 \times 240$ tanks, bending done by a cylinder $\Phi 63 \times 320$. Compact structure, good bending results. Clamping bend is controlled by the electrical system. Folding device and servo feeder mechanism with the completion of the bending duct work.



11. The electrical, hydraulic control system

1) Hydraulic systems and CNC combined to complete a full range of automatic and hydraulic functions. System main components of foreign famous hydraulic components, hydraulic components to ensure the stability and accuracy of movement.

2) the electrical control system central processor programmable logic controllers, drive with intelligent all-digital AC servo systems, human-machine interface for the high-resolution color touch screen, the system displays features 10 order management, among the orders with full, the count remains independent function, can facilitate the operator to view the day's work record case



3) Operating modes: manual, automatic operation, the order setting. Security and ground fault protection circuit have done absolutely reliable, safe start button, alarm devices, combined with good mechanical safety devices to ensure safe production, smooth

1. The hardware supporting list

1. CPU-A6 Industrial control board 1 set
Configuration: Epox low-power integrated four nuclear power plant threads CPU-A6-5200 / Memory 4G / 64G high-speed solid-state drive
2. NC08type axis CNC cards, matching adapter plate and connecting cables 1 set
Configuration: used two axes, the other two axes backup, differential pulse output, emergency stop signal input
3. PCI-IO-64eneral-purpose input and output control board supporting signal amplification adapter plate 1 set
Configuration: 32 inputs, 16 outputs
4. U Disk (System self-recovery U disk) 1 PC
5. Password dog 1 PC

2. Software main control functions:

1. CNC cards via two-axis pulse output, control the servo motor for precise feed control feed specified size, and bending mechanism;
2. through common input and output ports, the device can feed, punching "V" and "U", cut processing operation pusher, folding, five discharge line duct device control;
3. You can import any existing versions of AutoCAD drawings, the size and length as desired "V" and "U" bend and the position of the processing member (may be necessary to regulate and generate DXF drawing file Procedure requirements, such as: rectangles represent the total length of each material and the width of the red circle represents the big mouth and small mouth, red represents its center position, save the document to select AutoCAD 2004 DXF format option or use DXFOUT command);
4. operatives have to check fingerprint password management system (the development required to provide a complete development side management methods and procedures);
5. run before the system can identify whether a complete roll number, control number and quotation date information (when development is required to provide complete information about the developer meaning, control methods and procedures, format requirements, etc.);
6. Working with a number cannot be changed, copy and delete functions, and this can work for more than 2:00 related information via TCP / IP network commonly reported to the management office (the development required to provide complete information about the development side meaning, management controls and procedures, format requirements, etc.);
7. to be reworked after fingerprint authentication management personnel to conduct and generate new job number;
8. After all the work is completed, can generate: triplicate shipment note terms, each process using KG number, serial number of everyday use roll open information, stop margin, and daily consumption per lap re-cut the amount of information (when development is required to provide complete information about the developer meaning, control methods and procedures, format requirements and calculation methods)
9. can enter the number of processing-related products, and can input and record management function with the relevant information;
10. use Windows 7 operating system environment control interface;
11. in supporting the control dongle, a device for producing period can be set using the end-user, after the expiration of the lock-run feature automatically to match the sales work;



12. Monitor Samsung or Philips brand, 24-inch 1920x1080 widescreen with touch function
13. "Asia Eliot" TL-FRT610 USB fingerprint scanner,

E. The key components of the equipment list

Germany Rexroth servo system :

ITEM	SPECIFICATIONS AND MODELS	BRAND OR MANUFACTURER
Linear guide rail	HGL-35CN-1000	HIWIN
Cylinder		Taiwan
Oil pump	PV2R1F-19-F-R-AL	China
Rubber hose		China
Motor coupling	ECS-28φ38X60/φ19.05X30	China
Union joint		China
Motor		China
Hydro valve		Taiwan
Servo drive	HCSO2.1E-W0012-A-03-NNNN	Germany Rexroth
	MR-J2S-60A	Japan Mitsubishi
PLC	FPG-C32TH	Japan Panasonic
Touch screen		China
intermediate relay	HJ2	Japan Panasonic
Encoder	HES-25-2MHD	Japan Nemicon
AC Contactor	3TB43/AC24V	Japan
Proximity switch	IA08BSF20NO DC24V	Japan
Photoelectric switch	PA18CSD04NASA DC24V	Japan
Travel switch	WLD2	Omron
Inverter	CIMR-VB4A0005BBA 1.5KW	Yaskawa
Transformer	SG-0.8(380/220)	China