

FrameMac

LIGHT GAUGE STEEL PRODUCTION EQUIPMENT

Model:F1-C89

Technical Manual
(2020)



Being credible, pragmatic and innovative.
Pursuing to provide customers with the most sophisticated
technique and the largest industrial value.....

www.FrameMac.com

Device Details

Customer Name:	/
Unit Type:	F1-C89
Serial Number:	
Warranty Period:	One year

Disclaimer

- FrameMac provides customers with technical facilities .
- Customers shall bear full responsibilities for ensuring to conform local regulations and management and assuring safety .
- FrameMac bears no professional responsibilities. This disclaimer is applicable to hardware and software provided by this company .
- This company has always been upgrading its software and hardware products, once you apply the product, you accept the patent agreements.
- This company has the right to regularly update the manual without further notice. Updated contents shall be added in the new version.
- **Note:** Equipment failures caused by operation contradicting this manual void the product warranty.

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Warning ! When the device is operating, products will automatically come out from the discharge outlet in high speed. Keep away from the outlet, otherwise it can seriously or even fatally injure your body!

Instruction

Read the **Technical Manual** carefully and understand it completely before using the device. To avoid any damage or accident, make sure to install, operate and maintain the device in accordance with the manual.

Keep the **Technical Manual** in safe. Any doubt arises, contact our after sales service personnel please.

Operating Conditions

FrameMac F1-89 is a very sophisticated production system composing of computer control system, hydraulic system, servo system and coil material processing system. These components will operate most efficiently under appropriate conditions. Such components as hydraulic and computer parts and ink system are sensitive to temperature and environment, to keep the components operate most efficiently and to prolong their life-span , the following conditions shall be required:

- **Altitude:** 2000 meters below
- **Temperature :** -10°C~+35°C ;
- **Humidity :** No higher than 50% with a temperature of 35°C, and no higher than 90% with a temperature of 25°C ;
- **Atmospheric condition :** No media that may cause explosion; no gas that may erode metals ; no conductive dust; make sure the workshop clear of dust and away from intensive focal source and electromagnetic interference;
- **Beyond the reach of rain and snow ;**
- **Power :** Electric voltage shall range from 342V to 390V, and unbalanced voltage of the three-phase power supply must be within the scope(voltage negative sequence component and zero sequence component shall not excess 2% of positive sequence component) . Frequency shall range from 49.5~50.5HZ.

Installation

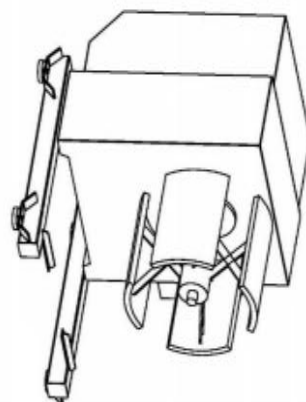
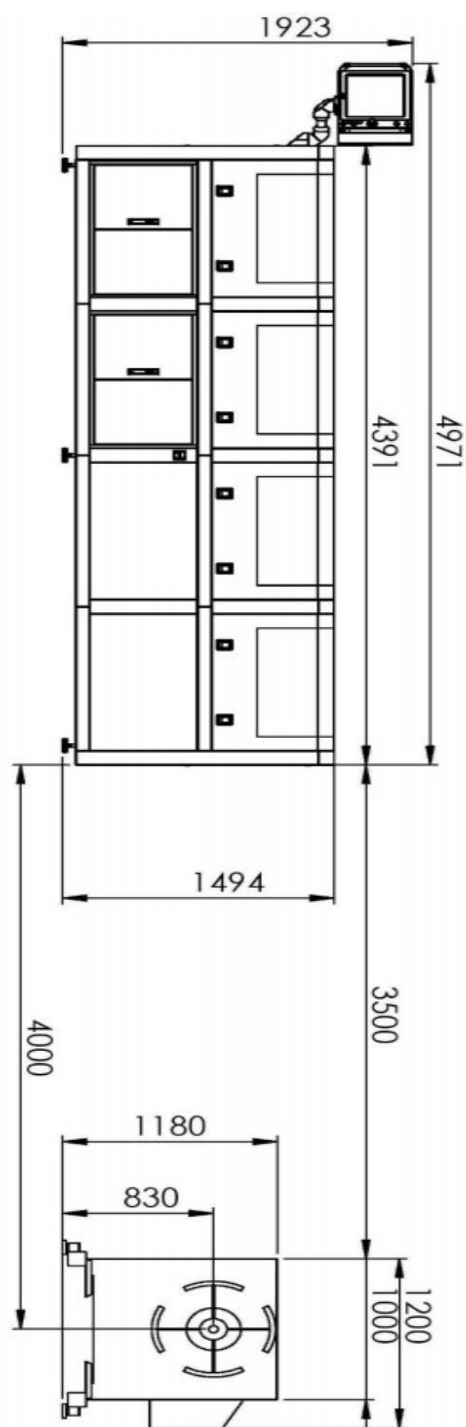
- Enough space shall be provided for the units for opening the doors and covers in case of maintenance.
- Make sure that the installation base is hard and stable enough.
- When the installation of the units is completed, lubricate all the moving parts, otherwise the parts may be worn more rapidly or even be damaged.
- For transportation safety, all hydraulic fluid has been removed from the device before leaving the factory. When the device is installed, inject hydraulic oil adaptable to local weather condition before debugging (hydraulic system instruction) .
- Open the shield of the units and the shield behind the main arch of device forming machine to inject some lubricating oil before operating(reducer connecting the main motor has been lubricated before leaving the factory).
- All wiring performance shall be compatible with the unit.

- Never connect any power cable such as electric welder that may cause line interference to the switchboard of the unit.
- Please see the **GB5226.1-2002 standard for** grounding cable, earthing resistance and other grounding precautions.
- Before switching on the device, check the cables to make sure there is no damage to the insulating leather, which may cause leakage of electric current or shock.



Unless absolutely
necessary ,do not remove
the shield of the device !

Installation



Safety

- The design of these devices meets the relevant national standards(GB), trade standards, and the requirements of safety, energy conservation and environment protection as well. The following standards are satisfied, but not limited to:

Q/12YJ4319-2003	Precision of special hydraulic press(extra grade) equal to that of Japan
JISB6403-1994	Special grade precision of special hydraulic press
GB26484-2011	Noise limits of hydraulic press
GB28241-2012	Safety specifications of hydraulic press
GB5226.1-2002	Code for construction and acceptance of automation instrumentation engineering
GB50093-2013	Code for construction and acceptance of automation instrumentation engineering
GB50254-2014	Code for construction and acceptance of low-voltage apparatus installation

- No accident may occur while the device is normally operating. However, aging and damage to the electric elements or fatigue defect may cause the device malfunction. If it is necessary for the operator to reach the punching press area and rotating parts, make sure all the moving parts are at rest to avoid any accidental disability.
- Safe operation rules shall be constituted for the workshop in accordance with relevant standards in combination with the reality of this enterprise. Operators must strictly obey all the rules.

- New operators shall be trained and examined for the qualification. Safety education and training shall be held at least once a year.
- Operating mechanical equipment is a simple, repetitive and boring job, which may make the operators bored and tired. Never operate in the state of impatience and tiresome.
- Hang a warning board beside the main switch of the units while installing, adjusting, overhauling or trouble shooting the devices powered off. The warning board must be eye-catching. If necessary, get somebody monitor the switch.

Safety

- Special inspectors shall inspect the devices regularly. Do not maintain or clean the devices while the equipments are operating. When the shield is separated or removed, do not switch on.
- Operators shall pay attention to the operating conditions, switch off to check immediately in case of abnormal noise or vibration.
- Operators shall be qualified for operating such units.
- Serviceman shall be qualified for professional maintenance to avoid any accident.
- Don't touch high voltage electric parts.
- Make sure to be familiar with the respective function of each button on the unit control box. Don't push the buttons randomly.
- Operators must be familiar with the emergency stop button, and in case of malfunction or other emergencies, push the emergency stop button and then cut off the general power supply.
- Don't put any tools and objects inside the units or on the shield to avoid any potential damage to the device or any accident.
- Water and oil could make the ground slippery and may cause danger, to avoid any potential accident, keep the ground clean and dry.

Power on requirements

- Make sure the lube oil has been added to the units as specified.
- Make sure hydraulic fluid has been filled.
- Make sure all the shields have been recovered before operating the units.
- Keep all unauthorized personnel clear of the operating area.

Overview



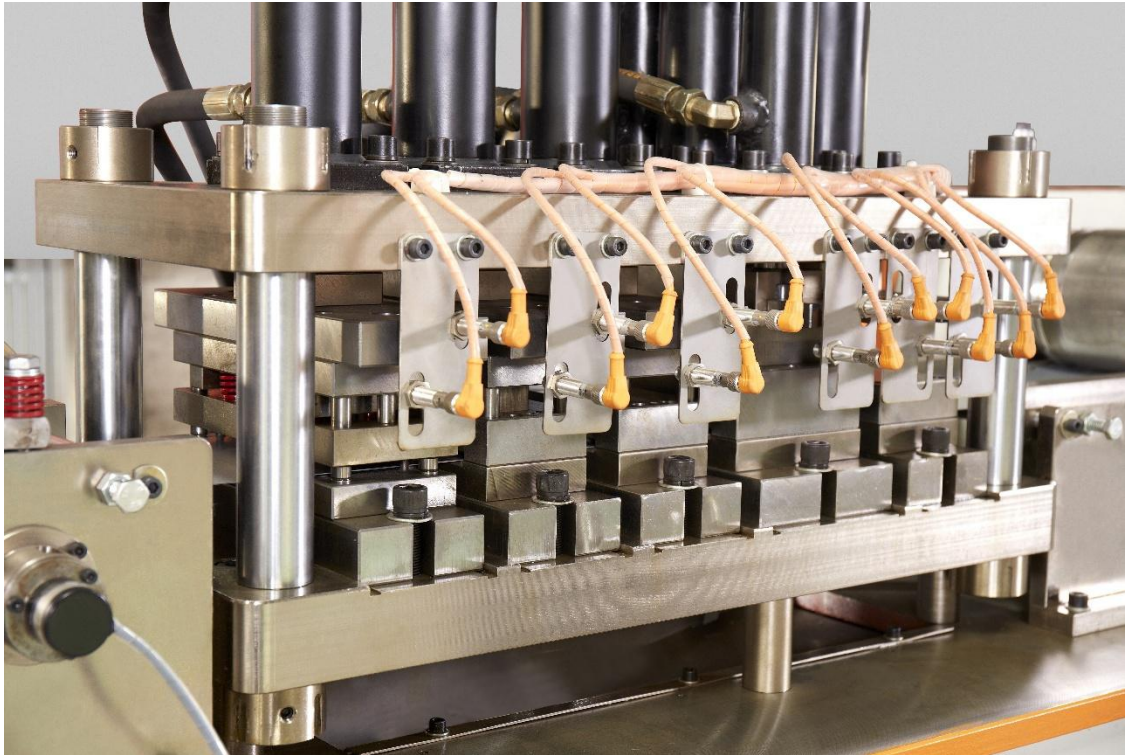
- **Solidity** : The machine weighs 5000kg, which keep it from being deformed during its handling, transportation and displacement, and it may work stably for a long time.
- **Transmission** : Precise hard tooth surface gears are applied between machine forming rollers, and its life can be 10 years with appropriate maintenance.
- **Forming roller** : Forming roller adopted in FrameMac made machine is optimized in design with COPRA roller design software from Data M, Germany, and is processed by a 12-group forming rollers and CNC processing center. Surface scratch of the keel product during the process of forming that may cause corrosion and reduction of the service life of house has been effectively prevented. Forming roller of FrameMac made machine is made of alloy die steel, and is wholly hardening above HRC60°. Generally, its service life can reach more than 10 years.
- **Press tool** : Special optimization in structure design makes the hydraulic punching machine complete stamping process with minor thrust, minimizes the failure rates of press tool and hydraulic system, effectively avoids the damage to the device (such as screw break, electric appliance parts falling off, hydraulic burst and oil spilling) caused by excessive equipment vibration, and reduces the noise greatly.

Production control system



FrameMac LGS Maker is a set of digital control system researched and developed independently by FrameMac with proprietary intellectual property rights, leading its counterparts home and abroad. This system is equipped with industrial computer to ensure it is suitable to all types of working environment. The system has independent intellectual property rights and is permanently free to use.

Stamping die station



- There are 9 independent hydraulic drive die stamping in the F1-C75 device, through which member bars are punched and cut off to be assembled into final product.
- The control system of the F1-C75 device must know the precise positioning of each die relative to the reference position. Refer to the machine tool control section of this manual for specific settings.
- The first 5 groups of moulds are equipped on the pre-punching die platform locating at the feed end, all of which operate before the coil material is formed.
- If the moulds are not in line with each other or with the forming roll, fine-tune them to the left or right.
- For the assembly of wall and truss, diversified holes and angles are punched by the moulds set and are cut off when the necking die operation completes.

Rewinding frame



Powered automatically expanding and uncoiling machine is adopted and the unwinding speed of the driving motor of the machine matches the forming speed of the main machine.

To avoid any accident, cranes or other auxiliary vehicles are necessary for the unwinding machine to unload the material.

Dimension : $L \times B \times H = 1900 \times 900 \times 1200$ (mm)

Maximum volume : 1200mm

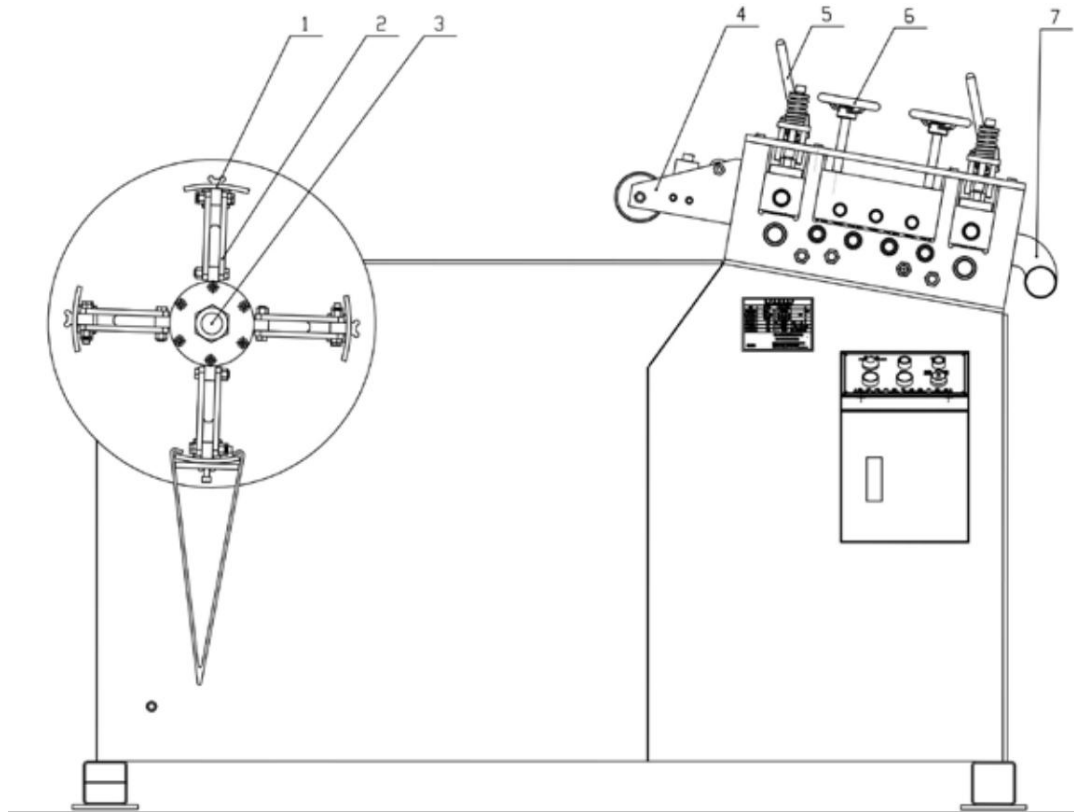
Maximum weight : not more than 2000kg

Bore : 450-530mm

Power of motor: 2.2kw

Speed : 15 M / Min

Layout of De-coiler structural composition



Composition:

- 1: Running Vane
- 2: Connecting bar
- 3: Draw bead
- 4: Material feeder
- 5: Up low rocker
- 6: Control Handwheel
- 7: Feed out Stand

2 in 1 Standard de-coiler & straightener

PLC main technical parameters

Button	State	Function
[POWER]	ON / OFF	When the power on, the indicator light is light up
[AUTO-OFF-MANU]	OFF	The decoiler can not run out if the power is cut off.
	MANUAL	The material leveling runout is control by [FORWARD]OR [REVERSE]
	AUTO	When decoiler under automatic state, it controlled by sensor circuit.
[EXPAND]	Inching	Expand the vane and adjust the material inner distance
[NARROW]	Inching	Narrow the vane and material inner distance
[FORWARD]	Inching	Leveling andFeed in material
[REVERSE]	Inching	Leveling and return the material

Features

- 1- Welcome to use 2 in 1 Standard de-coiler & straightener ;Roller with hard chromed treatment.
- 2- Save place & easy loading and adjusting coil material ,the upper work rolls adopt 4 worm gear micro ad-juster with braker.
- 3- The main shaft uses a reinforced type to make the coil material more smooth and increase the carrying capacity.

Installation Steps

- 1- Installation with expansion screws fixed on cement Foundation
- 2- Be sure the de-coiler & straightener without anti-rust oil ; The lubricant is added at the time of each oil injection unit (bearing position).
- 3- Please refer to electrical wiring layout for assembling.

Usage

1- Charging Coil - Material :

- A. Reduces the outer diameter of the running vane, less than the inner diameter of the steel coil 20 - 30mm ,and reset 4 pcs A-rack on running vane head .
- B. Trucking and loading coil to de-coiler with fix right with axis line .
- C. Expanding running vane and strong clamp inner of coil .
- D. Load up another 4 pcs A-rack and lock tight with screw .(The distance between coil material around 5 - 10 mm)

2- Straightening :

A. Click [**POWER**] ; State :Power light under uplumining.

B. Turn on [**POWER**] ; State : [**ON**]

C. Click [**OFF**] ; State : [**MANUAL**]

D. Flipping [**Up low rocker**] , feed in material in straightener ,and trun it down for clamp the material .

E. Inching [**FORWARD**] , dragging material in straightener .

F. Checking material after leveling and feed out .Please adjustment the straightener as below if leveling overly or deformation :

No.	Feed In	Feed Out	Adjust Method
1			Adjust control handwheel ; fine tuning ; press downward
2			Relax control handwheel ; fine tuning ; rises upward
3		VVVVVVVVVV	Relax control handwheel ; fine tuning ; rises upward
4			Reverse and forward again

G. Feeding speed is control and adjust by PLC timmer; Straightener working automatically when material not touch with inductor ; Inductor of feeder fixed in 30 - 45 degree .

H. Please click [**AUTO**] if connect with LGS for production .

I. [**FORWARD**] and [**REVERSE**] is contorl material feed in and feed out .

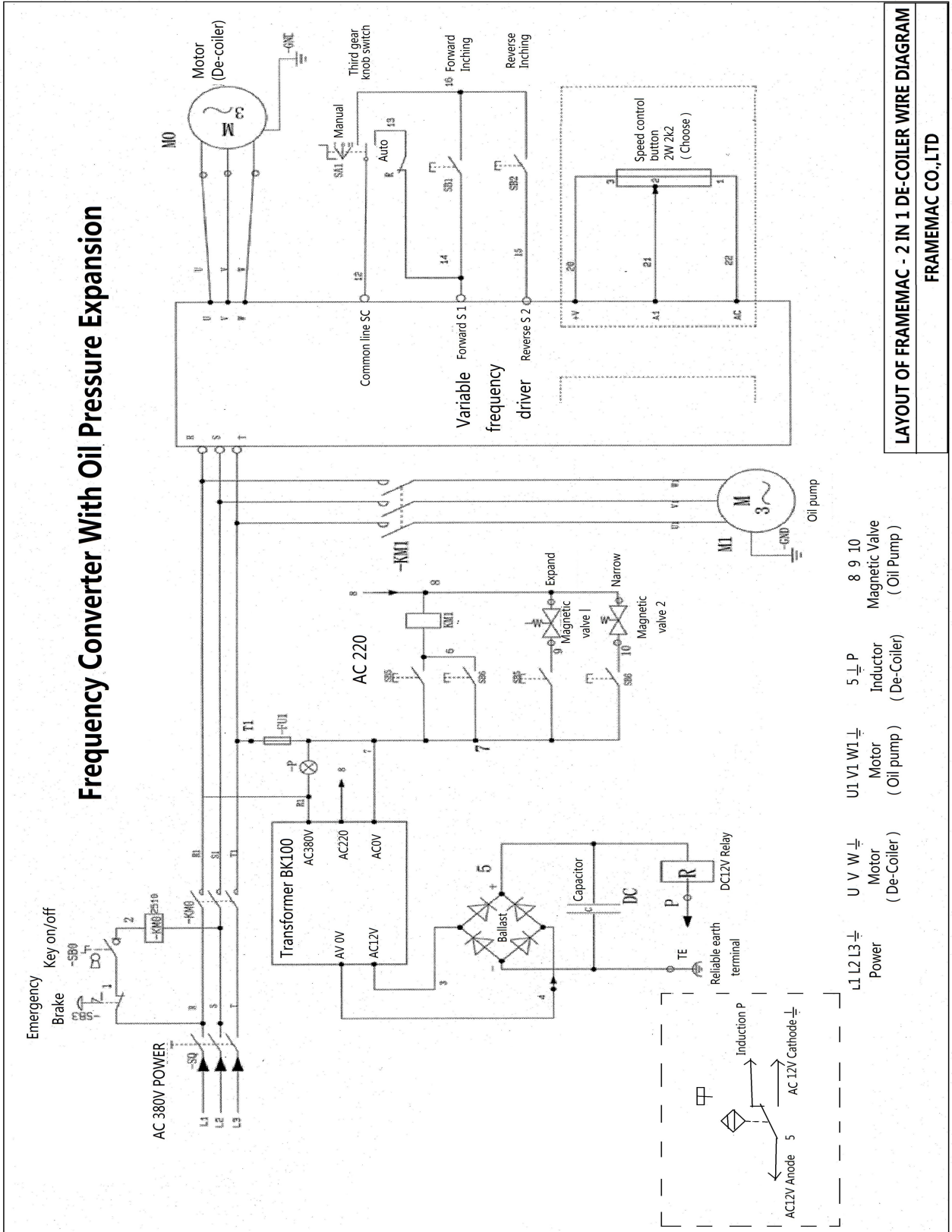
Trouble Shooting

Faults phenomenon	Failure reason	Trouble shooting
Motor stop working (straightener)	1- [START] button damage . 2- In a loose state of Motor's wire . 3- Motor burned .	1- Replace new button. 2- Checking for wire . 3- Replace new motor .
Cant stop working (leveling roller)	1- Wire of inductor malfunction. 2- Timer malfunction . 3- Relay : No work for 'ON' & 'OFF ' .	1- Checking for wire . 2- Replace new timer . 3- Replace new relay .
Material feed in malposition	1- Roller asymmetry 2- Too much burr of material .	1- Fine tuning, untill both sides balance . 2- Change another material .
Running vane too tight or not moving	1- No add lubricating oil . 2- Draw bead was get stuck .	1- Add lubricating oil . 2- Replace new draw bead .

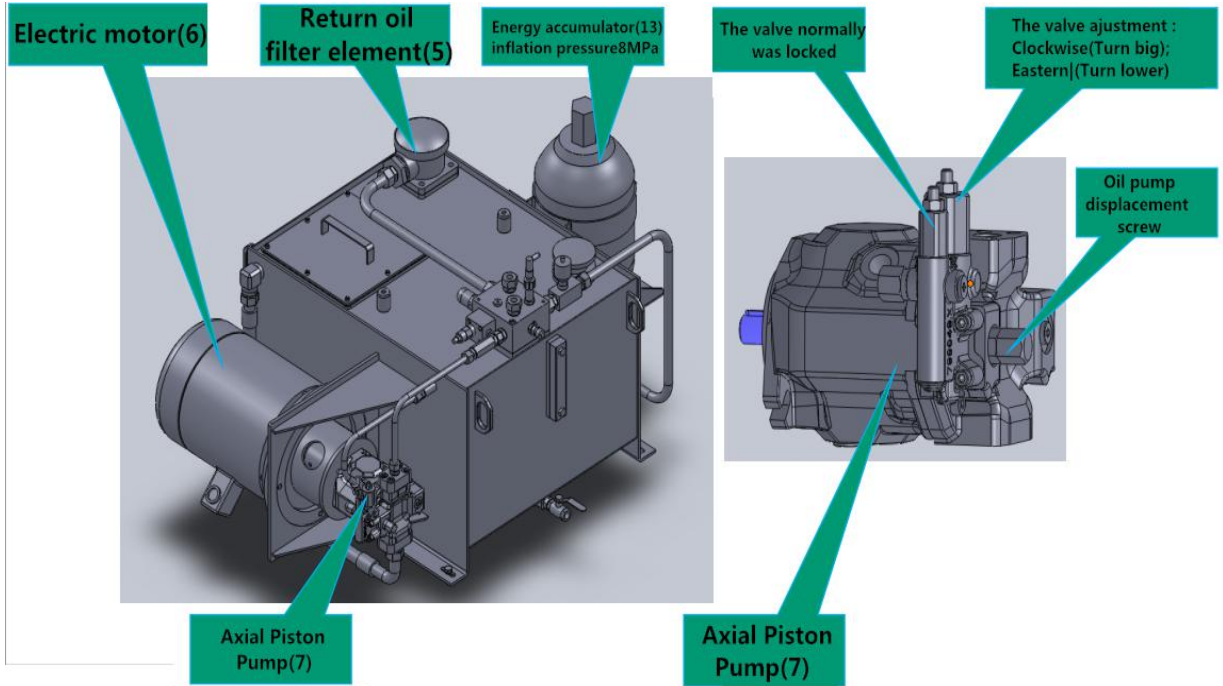
Maintenance

- 1- De-coiler : Add lubricating oil to running vane's grease nipple .(Every week).
- 2- Straightener : Make appropriate adjustments for control handwheel if necessary ,prevent too loose or too tight .
- 3- Regular inspections for fasteners and tightening if it loose .

Layout of De-coiler wire diagram



Hydraulic system



Hydraulic system of the FrameMac made machine is composed of original components from Germany Bosch Rexroth and motor of Swiss ABB brand, which effectively ensures the stability and life of the system.

Driving system



- A closed loop servo-control system is adopted in the F1-C75 device to control localization within the machine. Asynchronous or synchronous motor is used for rapid acceleration and deceleration roller. Two high resolution encoders are used to provide feedback on the position of the steel strip and the angular position of the rolling motor shaft. The 2 feedback signals are compared and processed in a frequency conversion drive so as to provide a positioning accuracy of + 0.5mm .
- The transmission adopts high quality gear drive, which ensures the accuracy of machining dimension.

Electric system



Electric connection

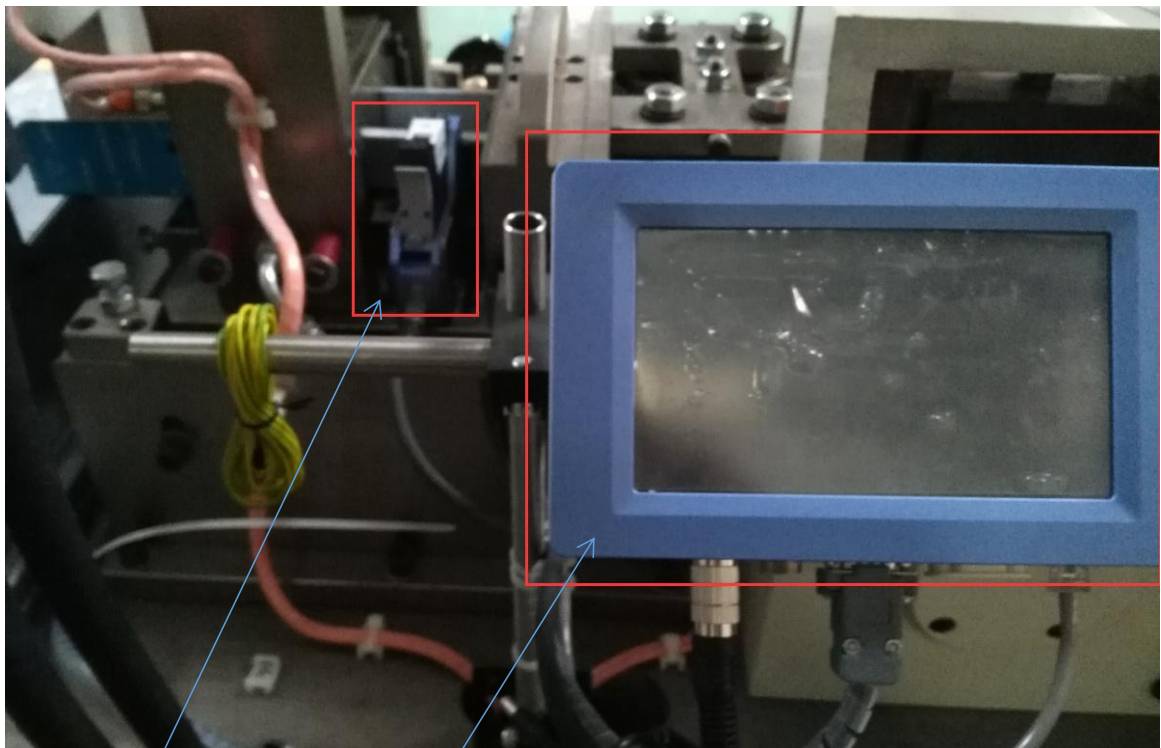
The F1-C75 device uses a 380VAC three-phase ground wire . The main electrical control cabinet (see the electrical cabinet connection) uses the 63A isolating switch, which is connected from the external electric cabinet and through the side cover . Turn on the electric cabinet and connect the three-phase wire, as shown in the "electrical cabinet connection". The grounding conductor must be properly connected to the common wire provided in the cabinet.

Important Note

- Make sure that the electrical power of the motor is adequately supplied to meet the requirements specified in the electrical specifications of the machine.
- Use appropriate sized lead according to the local wiring standards.
- Only fully qualified, certified electrical personnel can connect the power to this machine.
- Do insulation and grounding tests to ensure the integrity of electrical connections.

- All electrical connections to the equipment must comply with the relevant regulations and safety requirements, or other applicable local rules and regulations, regulatory requirements. Ignoring safe work can lead to serious injuries and even death.

Inkjet system

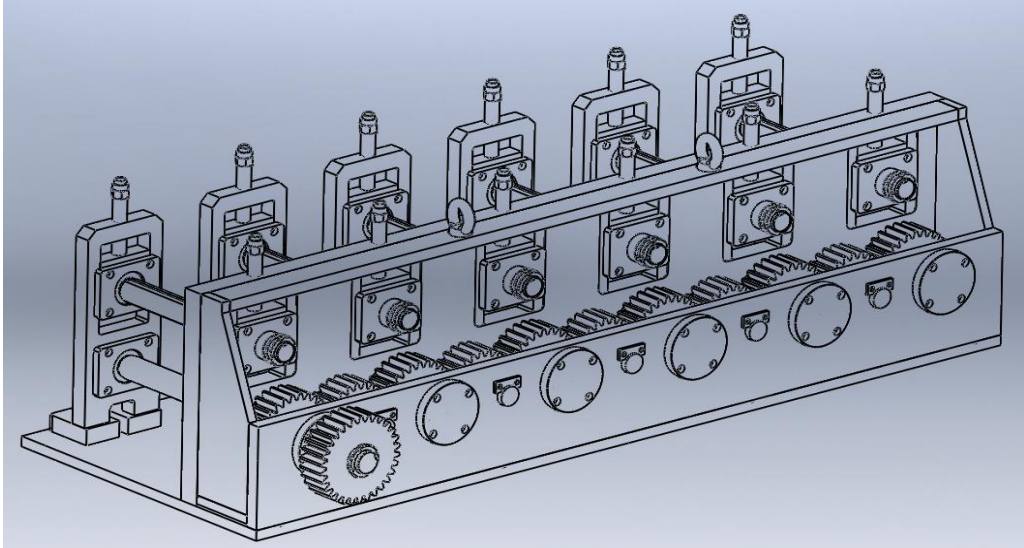


Nozzle、 Ink box

Touch screen

- Configure maintenance free electronic ink jet printer, and the writing is legible and firm, easy to assemble and install.
- Automatically print the logo generating by the design software without manual intervention.
- Other information such as company name, logo and website can be added willfully.

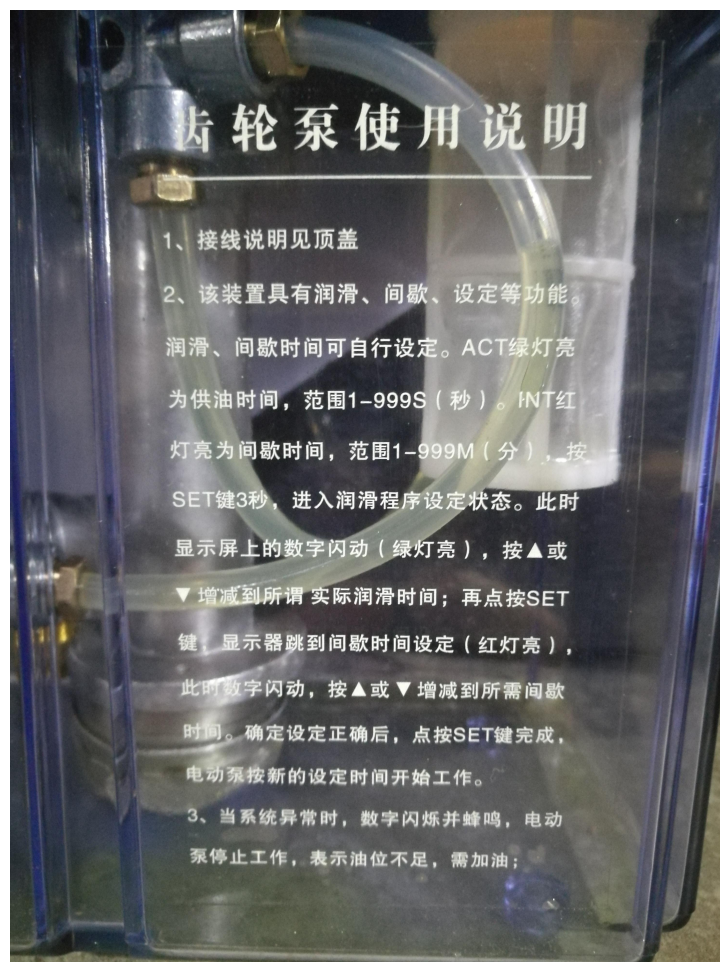
lubricating



- 1、 Please filling the 0# lubrication oil up to 3/4 lever .
- 2、 See The Top Cover For Wiring Instructions;
- 3、 The Device Has Lubrication, Intermittent, Setting And Other Functions
Of Lubrication, Intermittent Time Can Be Set. Act Green Light Is The Oil
Supply Time, Ranging From 1-999 (Seconds), Int Red Light Is The
Intermittent Time, Ranging From 1-999M (Minutes), Press Set Key For 3
Seconds To Enter The Setting State Of Lubrication Program. At This Point
On The Display Screen Of The Digital Flashing (Green Light Is On), Press
▲ Or ▼ To Increase Or Decrease The So-Called Actual Lubrication Time;
Click The Set Key Again, The Display Jumps To The Intermittent Time
Setting (The Red Light Is On), Then The Number Flashes, Press ▲ Or ▼ To
Increase Or Decrease The Required Intermittent Time. After Making Sure
The Setting Is Correct, Click The Set Key To Complete, And The Electric
Pump Starts To Work According To The New Setting Time.

lubricating

4、When The System Is Abnormal, The Number Flashes And Buzzes, And The Electric Pump Stops Working, Indicating That The Oil Level Is Insufficient And Needs Refueling.



Check list before startup

Make sure the operating temperature is between 0°C and 28°C	
Make sure the roll thickness setting of FrameMac Macker match the machined material.	
Make sure the material processing width is correct	
Make sure the ink is enough.	
Make sure the devices have been properly lubricated as indicated.	
Make sure there is no attachment on the roller.	
Make sure the shaft end nut is fastened.	
Lubricate the blade every four hours.	

Production settings of F1-C75

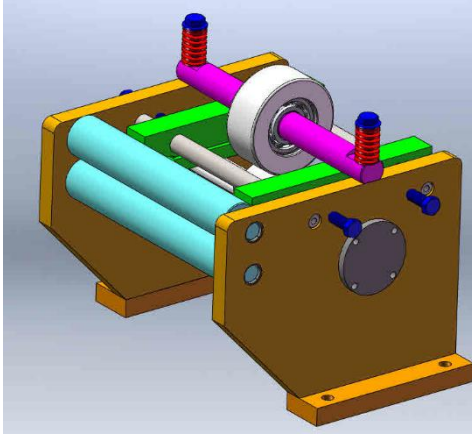


Main engine idler clearance setting

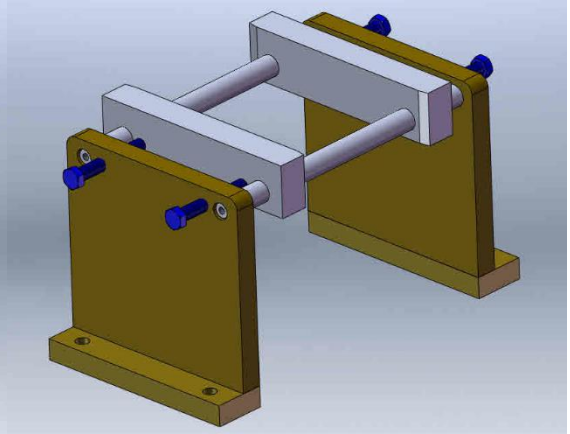
- Each spindle of the forming master is adjustable independently to suit the material of different thickness. The thickness of the material applies : 0.75mm~1.20mm
- Height adjustment is accurately set using a torque wrench according to the thickness of the material to be processed and material characteristics (usually in 11-14n.m), the adjustment process must ensure the balance of both ends of the shaft.
- The lower wheel is fixed and only the upper wheel is adjusted to control the gap.
- The roll will automatically adjust the gap as the thickness of the material diversifies. It is unnecessary to adjust the bolts to adjust the thickness. Generally, only the fine tuning of two groups ensures the precision of the product .
- Any deviation will result in defects in the product, such as distortion, bending or improper size, and other nonconforming products.

Coil stock introduction

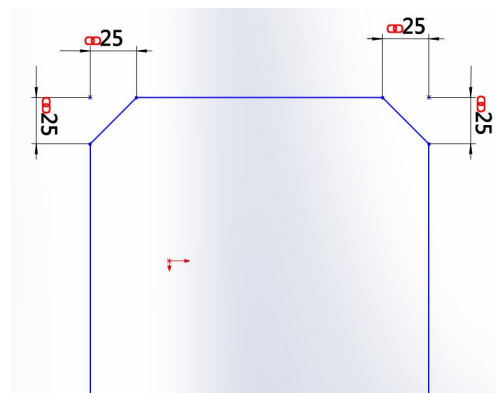
Centering device



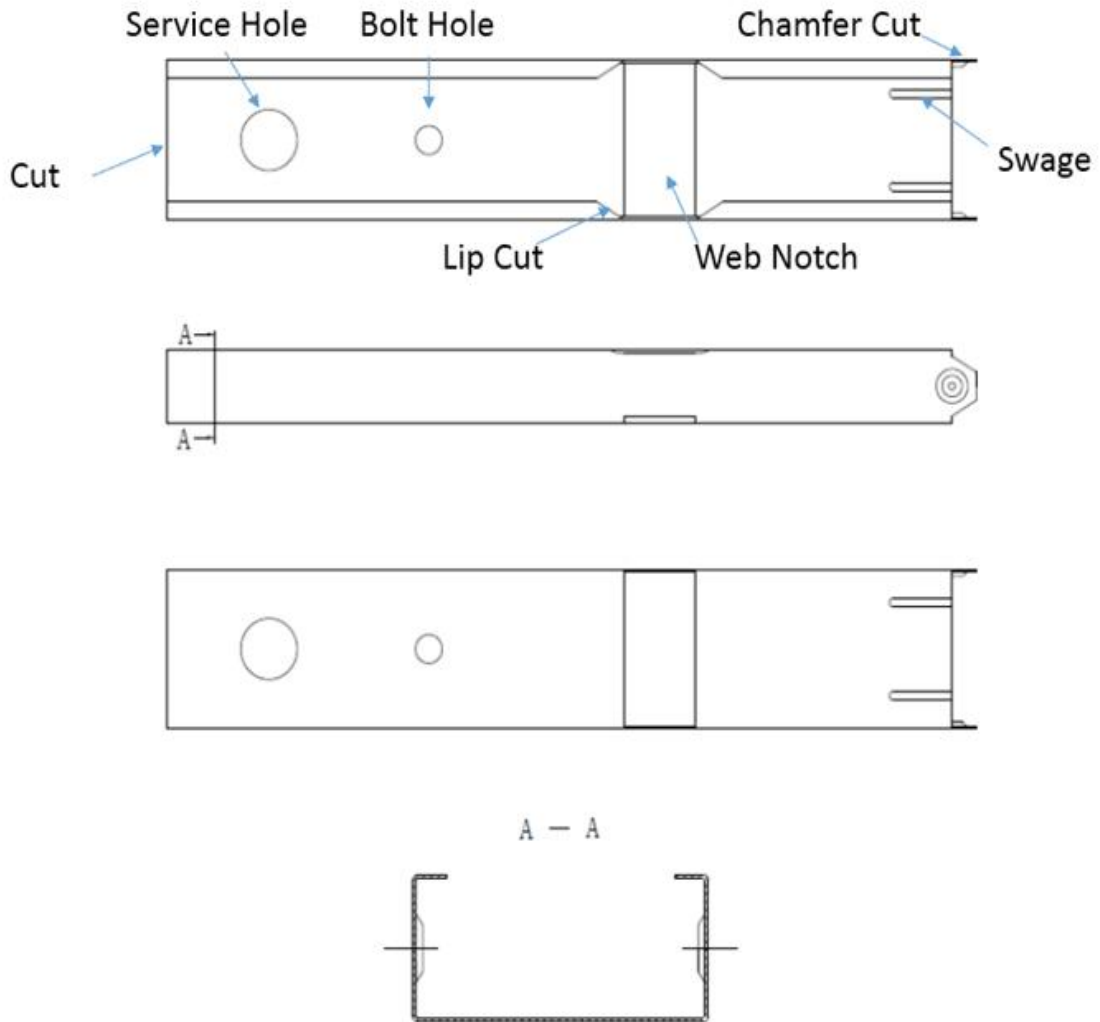
feeding device



- Feeding and centering devices are critical for machine forming, and roll centering ensures the complete symmetry of the product, which is key for the product to meet the design criteria.
- The guiding device, in combination with a coil material device, vertically rolls the centering material into a roller set and a punching shear device.
- Feeder ensures the material enter the rollers set in alignment and all die in the same benchmark.
- Before feeding, the material must be cut in the following pattern to prevent the material from being blocked during the first feeding.



Press tool



Shall any dimensional error arises, adjusting the position of the mould without permission is not recommended. Instead, adjust it in Framemac Maker as will be mentioned hereafter.

FrameMac

LIGHT GAUGE STEEL PRODUCTION EQUIPMENT

Model:F1-C89

Control System Manual
(2020)



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Warning ! When the device is operating, products will automatically come out from the discharge outlet in high speed. Keep away from the outlet, otherwise it can seriously or even fatally injure your body!

FrameMac LGS Maker production control system

Host operating platform



Trouble light : yellow, corresponding to the status bar of the LGSmaker system;

Automatic / manual switching knob : switching between the automatic and manual modes of the equipment ;

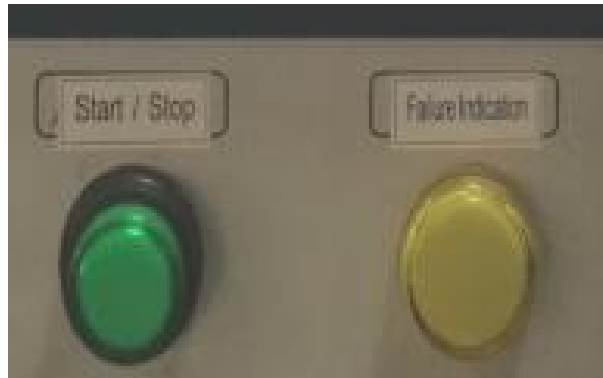
Manual mode : equipment debugging, as well as parameters correction and other functions ;

Automatic mode : for processing and production ;

USB interface : for external production drawing data import .

FrameMac LGS Maker production control system

Working mode indicator



The above picture shows the working indicator lights.

Trouble light : Display automatically.

Three status:

- 1.Dark : Normal.
- 2.Flashing : The device is in a fault state, reminding the staff to inspect it.
- 3.Lighting : The device is in a fault state and the staff is inspecting.

Run / stop light : can operate manually and choose either state.

- 1.Dark : The device is not operating.
- 2.Lighting : The device is operating normally.

FrameMac LGS Maker production control system

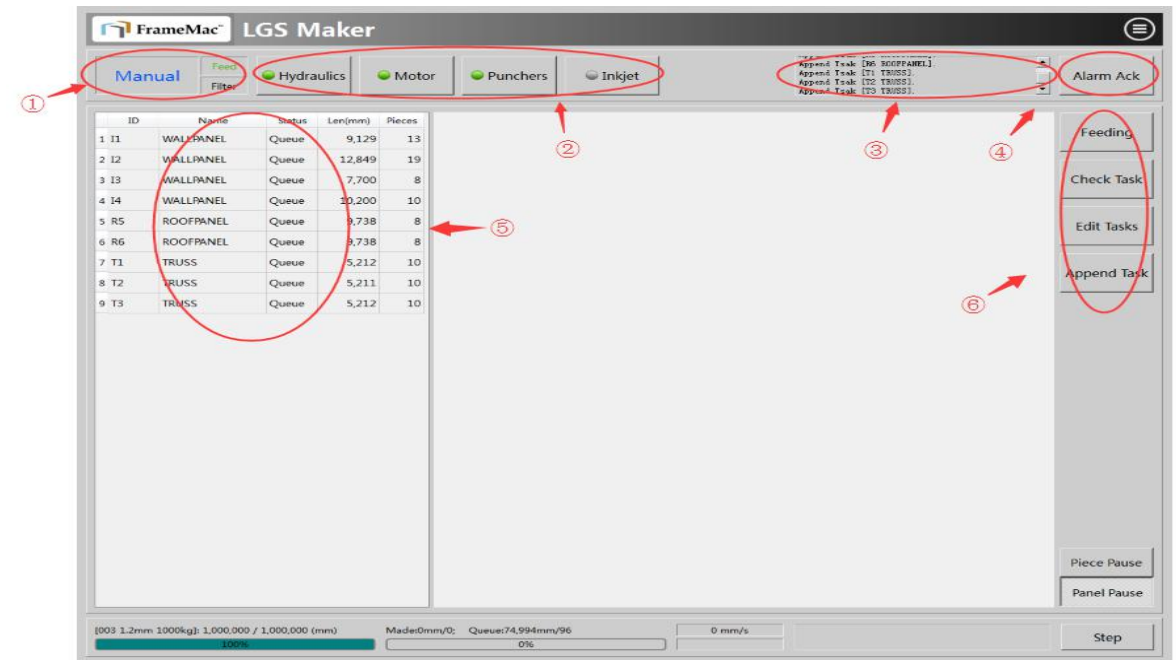
Boot operation

- 1、 Switch on the main machine and the electric box of unwinding machine.
- 2、 When the main power supply is switched on, the computer control system runs automatically. Click on the icon of FrameMac control software on the desktop, then the device including main machine, hydraulic system and inkjet equipment are completely operated.



FrameMac LGS Maker production control system

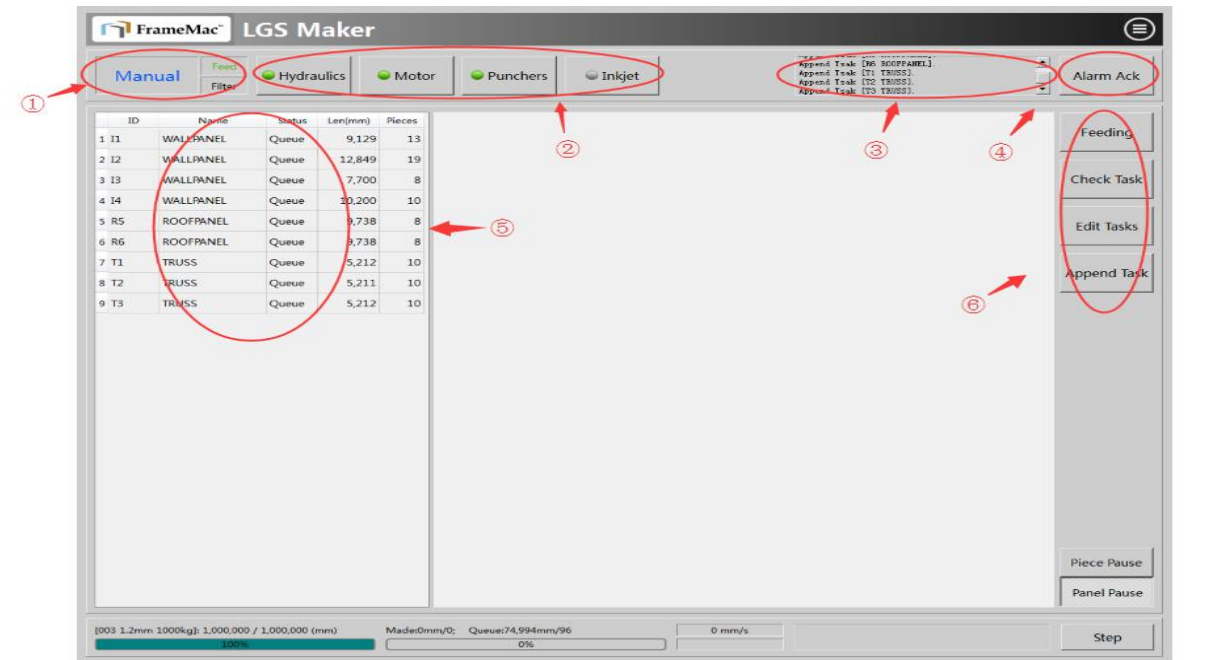
FrameMac operating interface



- ①: "Device status display bar" , the above listed picture shows the state of "pause".
- ②: "Working states of every parts" , green light means "work", red "alarm" and gray "stop".
- ③: "Real time record of equipment operation" shows the real time working state of the device.
- ④: "Alarm confirmation" . If device ① shows "alarm" , after solving the problem , click "Alarm confirmation" and the "alarm" will change to "pause", which means the device can operate normally. If any other information is displayed on the screen, please debug following the indication.
- ⑤: Task bar

FrameMac LGS Maker production control system

FrameMac operating interface



⑥:Function key.The device has five working states

A. Pause. The device stops working temporarily and press the "run" button to resume work .

B.Scram.The device is in an emergency stop state because of emergency or “scram”pressing . Reset the “scram”button to resume work.

C. Work. The device is operating normally.

D. Alarm. The device enters the alarm state because of other parts or improper processing. In case of alarm, look up the display on the upper right to solve the problem, then click on “alarm confirmation”and the device will resume to “pause”.

E. Manual mode. Switch to the “manual mode”to set up the device manually.

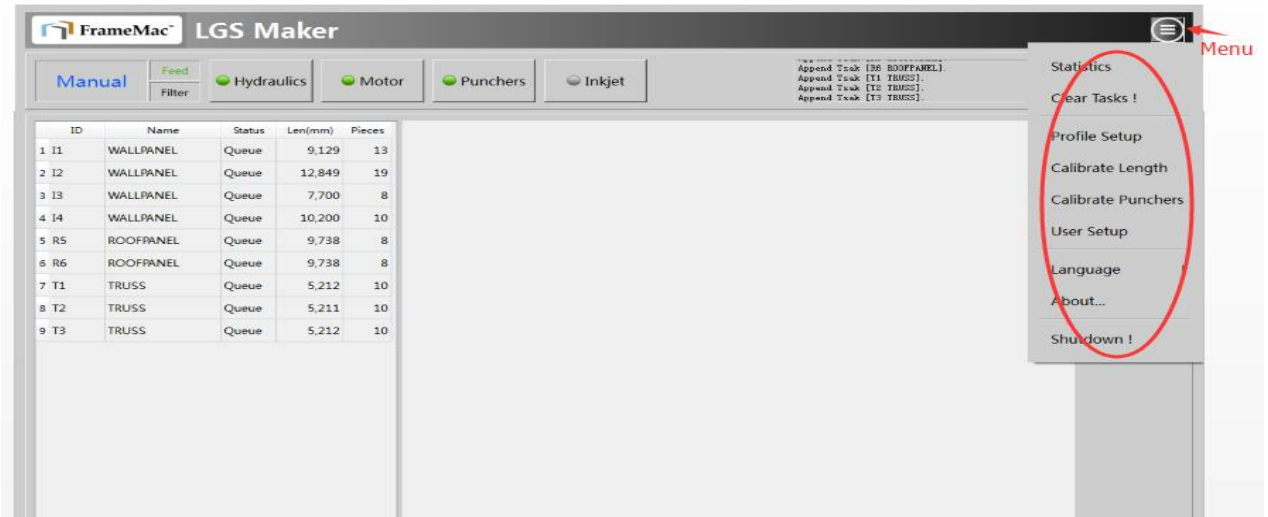
FrameMac LGS Maker production control system

Manual mode & Automatic mode

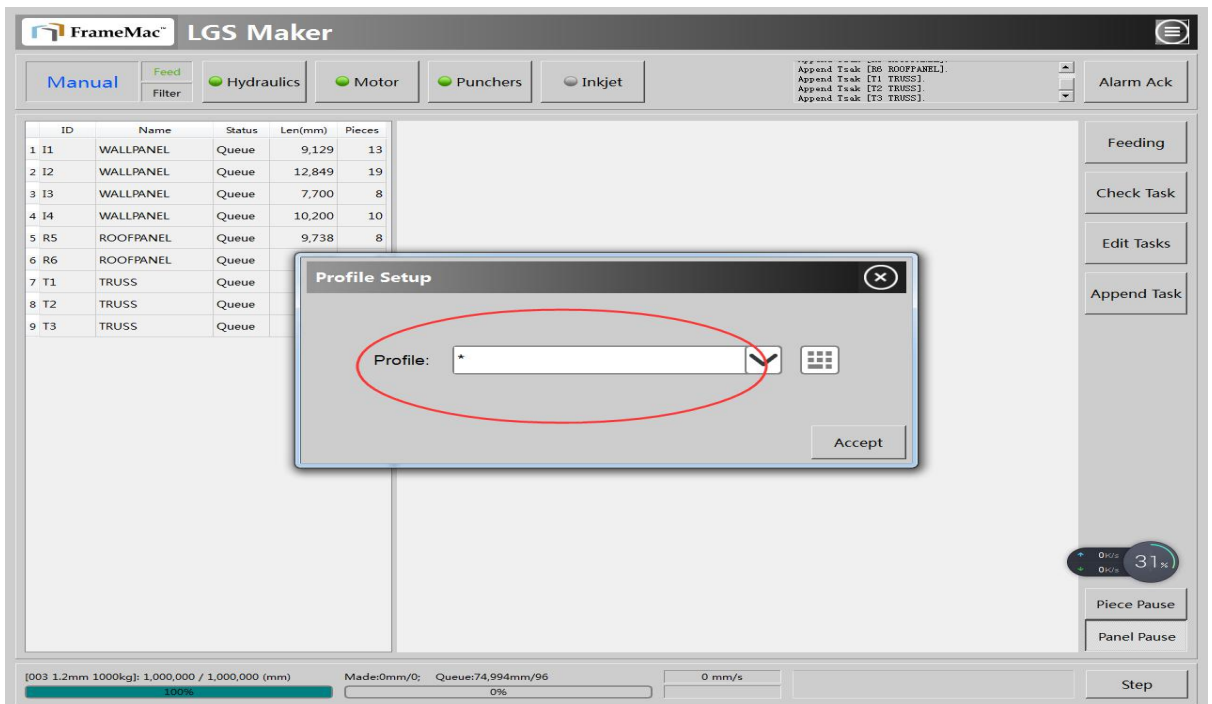
- Switch the knob to the manual mode, then the device enters the manual mode.
- Purpose of manual mode:
(1). For replacing coil stock, testing the working condition of the components(motor, hydraulic device, punching set) and detecting the operation of every station.
- Purpose of automatic mode : For normal processing and equipment debugging .

FrameMac LGS Maker production control system

Debugging of device



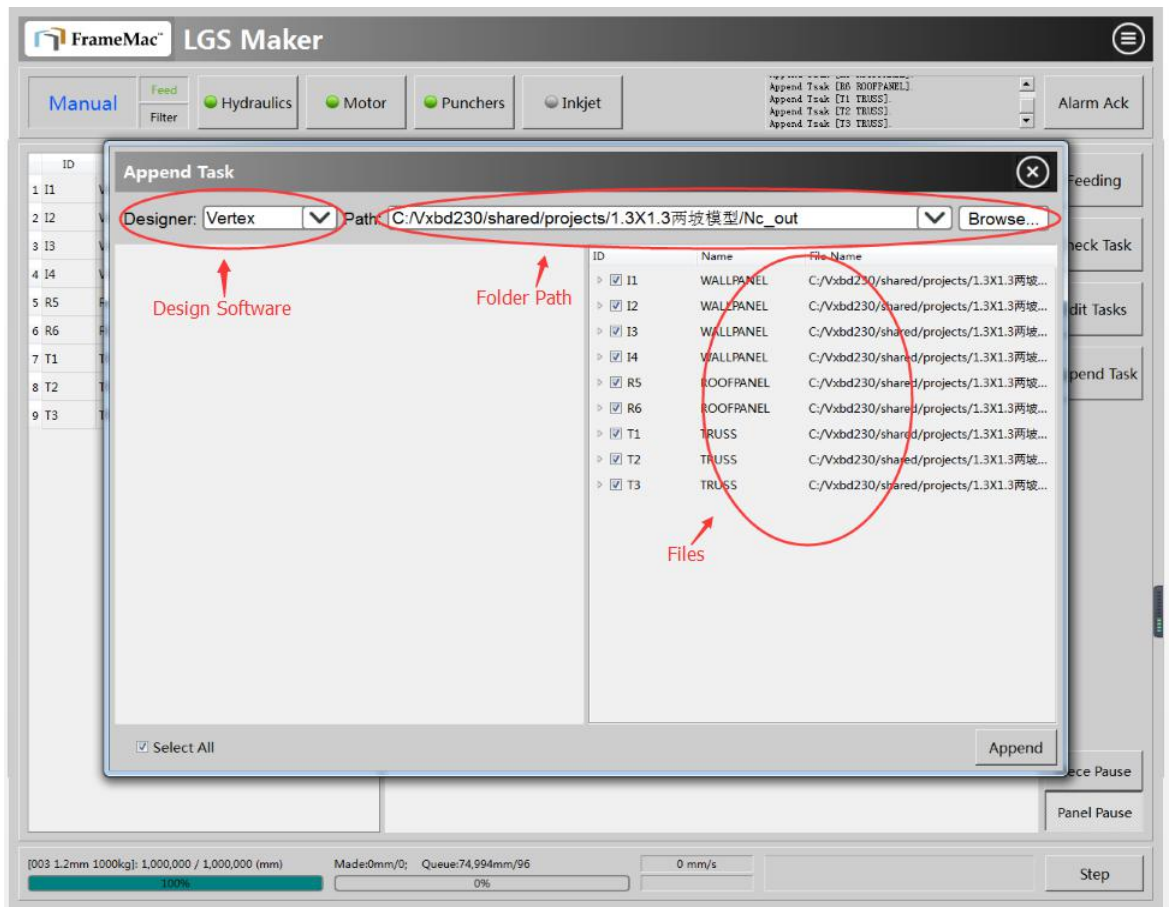
Click on the “system functions” on the upper right to choose processing specifications. “*” means all specifications are readable, while others mean the corresponding specification.



FrameMac LGS Maker production control system

Add task

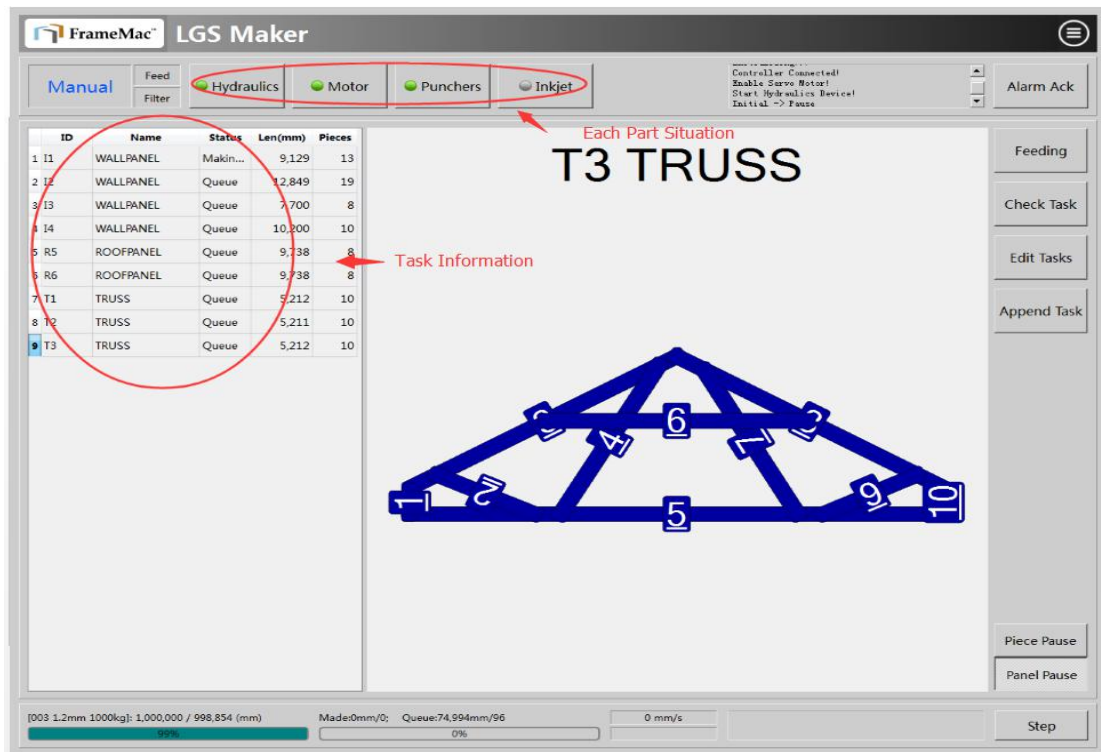
Copy the processing files to the computer storage space through the "USB interface" in the computer of the production control device, click the "add tasks", select the file type, then select the debugging with the corresponding folder path, click OK to view the contents of the file in the folder. Selective choose the files to print, and then click to add.



FrameMac LGS Maker production control system

Monitor the working status of the components

As shown in the following figure, see the upper parts, and if there is no fault, you can enter the debugging process .



Switch to the "automatic" mode. As shown in the above figure, 1. "Single step" on the lower right - when installing and debugging, check whether the function of each step (feeding and punching) is running normally.

2. "Pause by piece " - click on this button, after the production of a single piece of work, enter into a suspended state to inspect whether each product conforms to the standard

Measure the size of finished products, if there' s any position and dimension deviation, calibrate the device.

FrameMac LGS Maker production control system

Reload the coil stock

- 1、 Switch the “mamual/automatic”button to the “manual mode”



2、 Take out the remote control switch, check whether the machine set is operating. Adjust the feeding frame width and introduce materials conforming to the specifications onto the guide plate, and then slowly into the stamping die to roll position.

3、 Press the remote control switch and push the material into the third group of forming roller, when the material enters into the final two wheel group, attention shall be paid to check whether the products meet the requirements of the shape, and adjustment shall be done to meet the desired requirements if necessary, fasten the screw.

A. Programming interface :

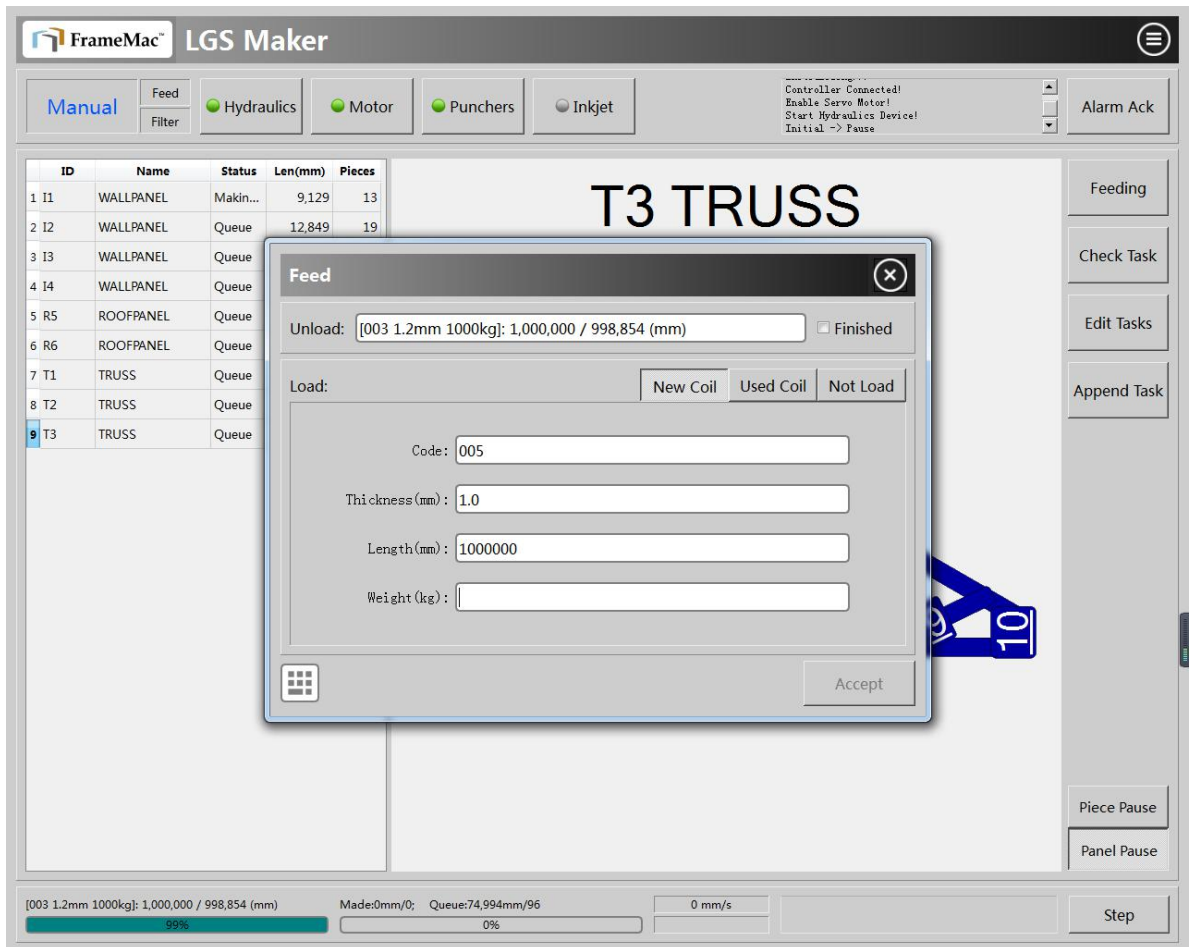
Reloading operation. Click on “feed”, and choose “ bait”while the device is in the “pause”state. Reload the coil stock and choose “loading” and input the data of roll material in the corresponding column and click on “OK”.

B. Take out the remote control switch, check whether the machine set is operating. Adjust the feeding frame width and introduce materials conforming to the specifications onto the guide plate, and then slowly into the stamping

FrameMac LGS Maker production control system

Reload the coil stock

C. Press the remote control switch and push the material into the third group of forming roller, when the material enters into the final two wheel group, attention shall be paid to check whether the products meet the requirements of the shape, and adjustment shall be done to meet the desired requirements if necessary, fasten the screw.



The screenshot shows the FrameMac LGS Maker production control system interface. The main window displays a table of production tasks, a 'Feed' dialog box for reloading coil stock, and various control buttons.

ID	Name	Status	Len(mm)	Pieces
1 I1	WALLPANEL	Makin...	9,129	13
2 I2	WALLPANEL	Queue	12,849	19
3 I3	WALLPANEL	Queue		
4 I4	WALLPANEL	Queue		
5 R5	ROOFPANEL	Queue		
6 R6	ROOFPANEL	Queue		
7 T1	TRUSS	Queue		
8 T2	TRUSS	Queue		
9 T3	TRUSS	Queue		

The 'Feed' dialog box is open, showing the following fields:

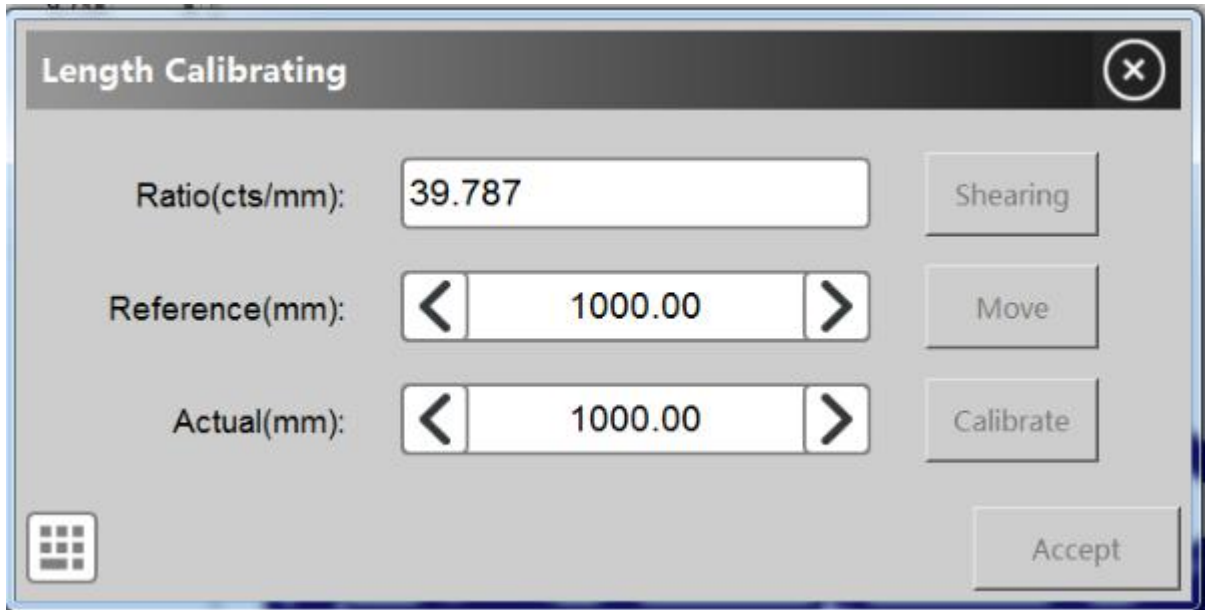
- Unload: [003 1.2mm 1000kg]: 1,000,000 / 998,854 (mm) ☐ Finished
- Load:
- Code: 005
- Thickness (mm): 1.0
- Length (mm): 1000000
- Weight (kg):

The 'Accept' button is visible at the bottom right of the dialog box.

The main window also displays the title 'T3 TRUSS' and a status bar at the bottom showing production progress: [003 1.2mm 1000kg]: 1,000,000 / 998,854 (mm) Made:0mm/0; Queue:74,994mm/96 0 mm/s Step.

FrameMac LGS Maker production control system

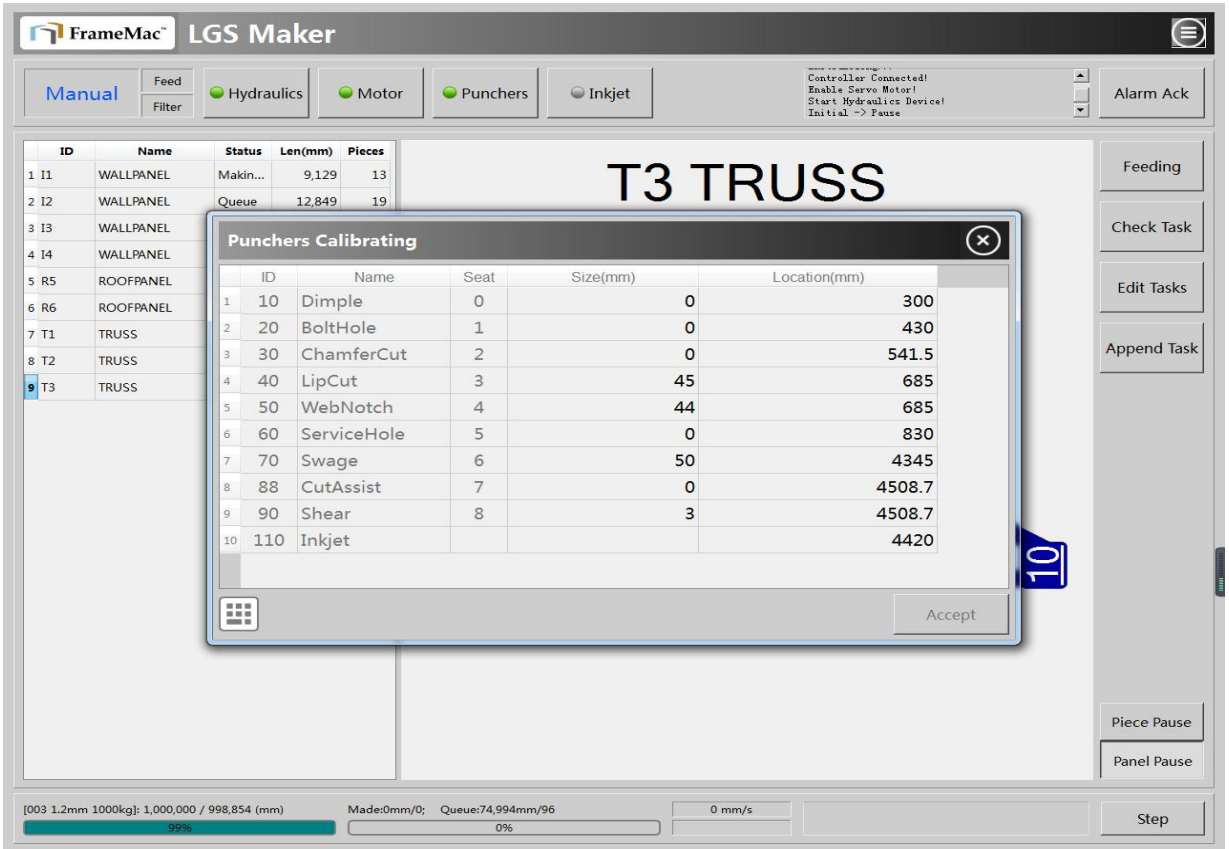
Length precision proofreading



1. Click on **“feed”** to feed manually, and click on **“shear”** to shear a zero shear material.
2. Click on **“feeding”**, after the instruction length reaches a certain length, click the **“shear”** operation, measuring the length of the output product +5mm (the thickness of the cutter)
3. Enter the **“real length”**, click on **“calculate”** - **“confirm”**, and save the length factor.
4. Repeat the above steps and make sure the gap between **“real length”** and **“instruction length”** is within the error range.

FrameMac LGS Maker production control system

Adjust the punch group



The screenshot shows the FrameMac LGS Maker software interface. The main window displays a table of tasks and a 'Punchers Calibrating' dialog box. The dialog box contains a table with columns: ID, Name, Seat, Size(mm), and Location(mm). The table lists 10 punchers, including Dimple, BoltHole, ChamferCut, LipCut, WebNotch, ServiceHole, Swage, CutAssist, Shear, and Inkjet. The 'Accept' button is visible at the bottom right of the dialog box.

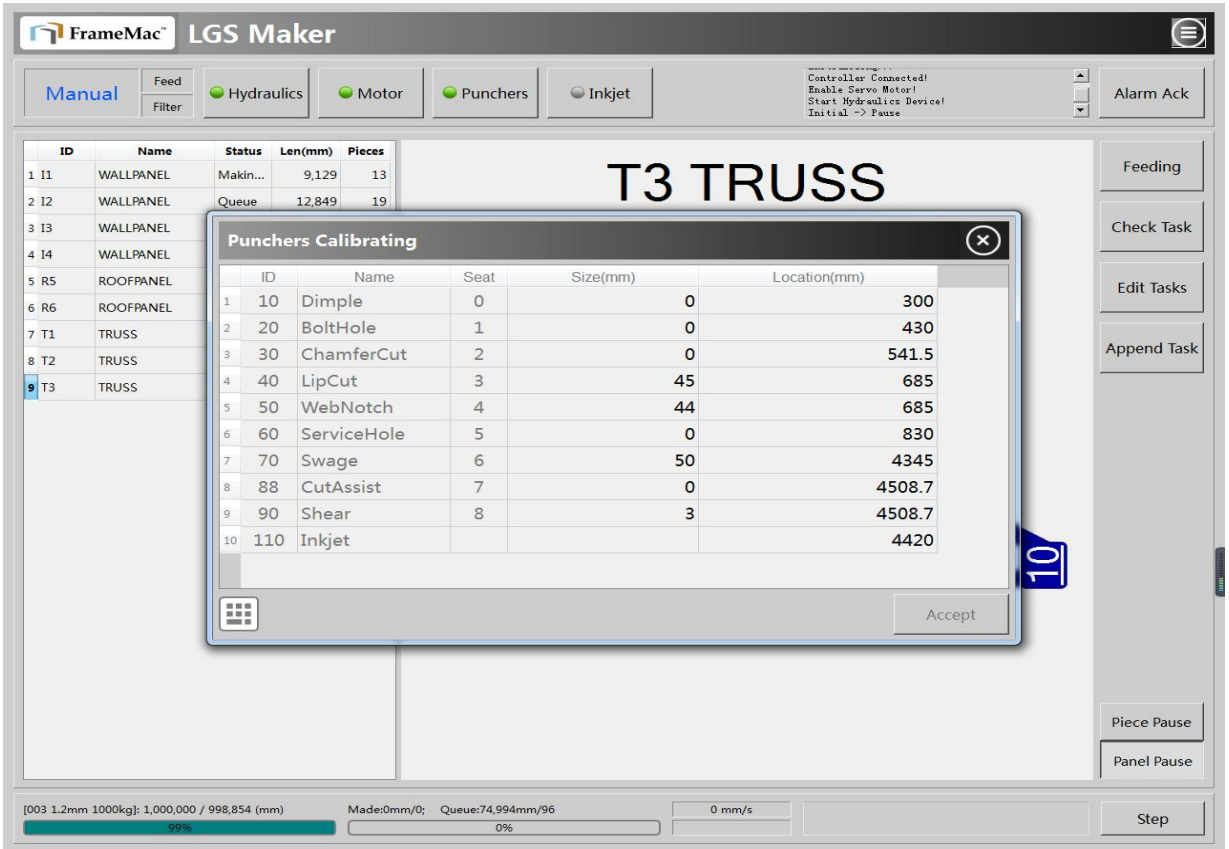
ID	Name	Seat	Size(mm)	Location(mm)
1	10 Dimple	0	0	300
2	20 BoltHole	1	0	430
3	30 ChamferCut	2	0	541.5
4	40 LipCut	3	45	685
5	50 WebNotch	4	44	685
6	60 ServiceHole	5	0	830
7	70 Swage	6	50	4345
8	88 CutAssist	7	0	4508.7
9	90 Shear	8	3	4508.7
10	110 Inkjet			4420

After the length correction is completed, if there is still any deviation of other location dimensions, adjustment to the punch Group " is necessary. Click on the corresponding functional dimensions to correct "coordinates " ,then click OK to save the settings.

Adjustment method : target offset , equipment discharging direction is the positive direction, if the 5mm is shifted in that direction, enter +5mm; if in the other direction, then - 5mm.

FrameMac LGS Maker production control system

Adjust the punch group



The screenshot shows the FrameMac LGS Maker software interface. A modal dialog box titled "Punchers Calibrating" is open, displaying a table of punch parameters. The background interface includes a task list on the left, a central title "T3 TRUSS", and various control buttons on the right and bottom.

ID	Name	Seat	Size(mm)	Location(mm)
1	10 Dimple	0	0	300
2	20 BoltHole	1	0	430
3	30 ChamferCut	2	0	541.5
4	40 LipCut	3	45	685
5	50 WebNotch	4	44	685
6	60 ServiceHole	5	0	830
7	70 Swage	6	50	4345
8	88 CutAssist	7	0	4508.7
9	90 Shear	8	3	4508.7
10	110 Inkjet			4420

Buttons in the dialog: Accept

Buttons in the background interface: Manual, Feed, Filter, Hydraulics, Motor, Punchers, Inkjet, Alarm Ack, Feeding, Check Task, Edit Tasks, Append Task, Piece Pause, Panel Pause, Step.

Status bar: [003 1.2mm 1000kg]: 1,000,000 / 998,854 (mm) Made:0mm/0; Queue:74,994mm/96 0 mm/s 99% 0%

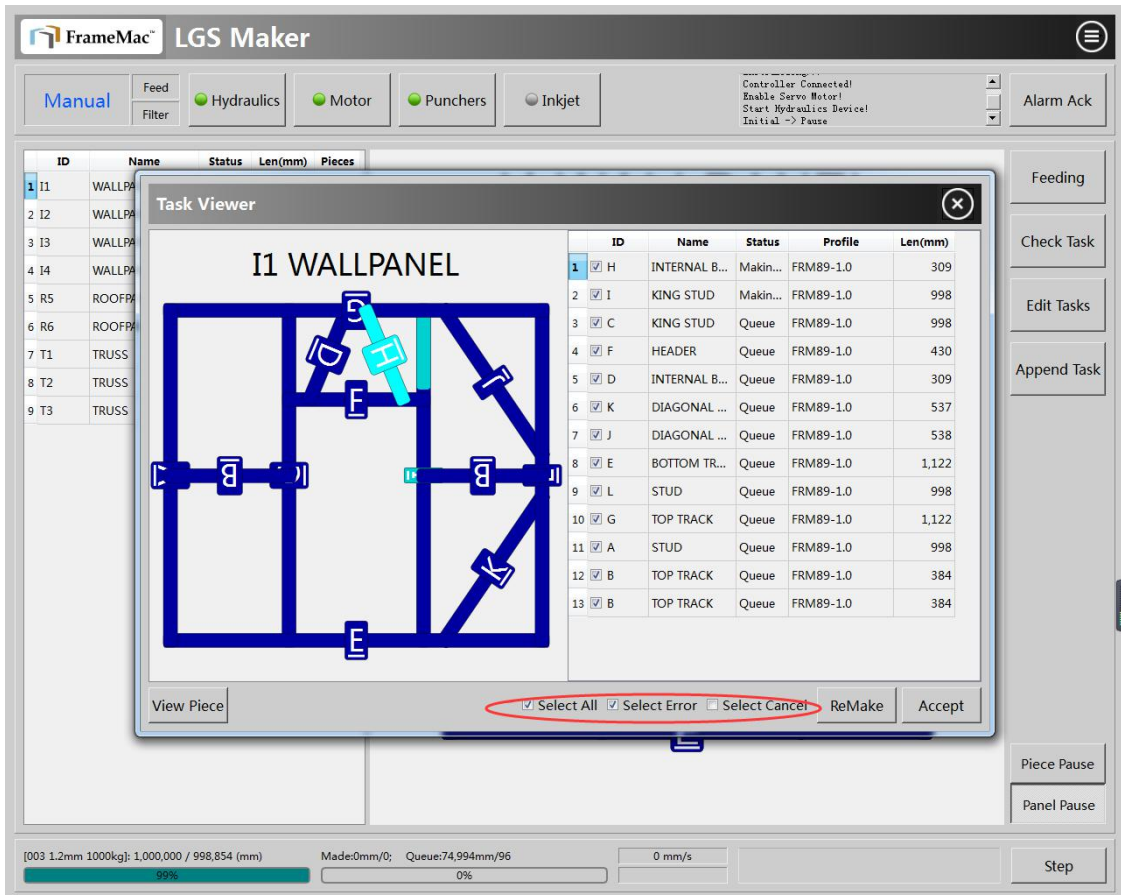
“Coordinates” -- The size is the distance between the processing position to the device feeding point. After the punch group reedit the data, which will take effect when restart the LGSMaker software .

Make sure the machining accuracy is correct and then start production.

FrameMac LGS Maker production control system

Normal production

Switch to “**automatic mode**” and add task, the steps to add task is similar to that of adjustment.

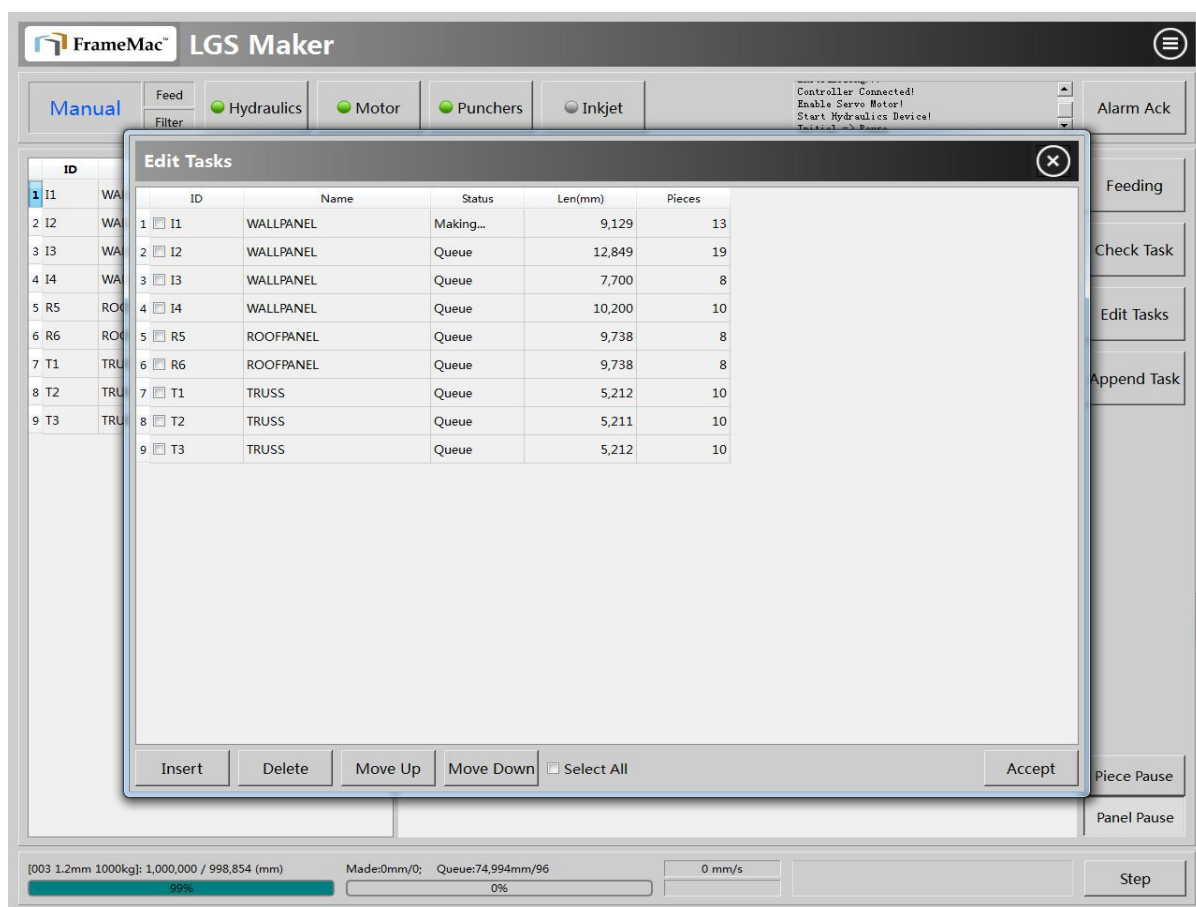


Click on “**view the task**” to display the present production state of “**production**” , “**queuing up**” and “**completed**” .
“**production**” means the task is operating, “**queuing up**” means “**waiting for production**” ,and “**completed**” means the task is completed.

FrameMac LGS Maker production control system

Normal production

Change task or its order, add or delete task.



The screenshot displays the FrameMac LGS Maker software interface. A central 'Edit Tasks' dialog box is open, showing a list of tasks with columns for ID, Name, Status, Len(mm), and Pieces. The tasks are as follows:

ID	Name	Status	Len(mm)	Pieces
1 I1	WALLPANEL	Making...	9,129	13
2 I2	WALLPANEL	Queue	12,849	19
3 I3	WALLPANEL	Queue	7,700	8
4 I4	WALLPANEL	Queue	10,200	10
5 R5	ROOFPANEL	Queue	9,738	8
6 R6	ROOFPANEL	Queue	9,738	8
7 T1	TRUSS	Queue	5,212	10
8 T2	TRUSS	Queue	5,211	10
9 T3	TRUSS	Queue	5,212	10

At the bottom of the dialog box, there are buttons for 'Insert', 'Delete', 'Move Up', 'Move Down', 'Select All', and 'Accept'. The background interface shows various control buttons like 'Manual', 'Feed', 'Hydraulics', 'Motor', 'Punchers', 'Inkjet', and 'Alarm Ack', along with a status bar at the bottom displaying production metrics.

FrameMac LGS Maker production control system

Normal production

View the task:

View the present state of tasks and the overall condition.



The screenshot displays the FrameMac LGS Maker software interface. At the top, there's a header with the FrameMac logo and 'LGS Maker'. Below this is a control bar with buttons for 'Manual', 'Feed', 'Filter', 'Hydraulics', 'Motor', 'Punchers', and 'Inkjet'. On the right, there's a status area with text: 'Controller Connected!', 'Enable Servo Motor!', 'Start Hydraulics Device!', and 'Initial -> Pause'. An 'Alarm Ack' button is also present.

The main area is divided into a task list on the left and a 'Task Viewer' window in the center. The task list shows a table with columns: ID, Name, Status, Len(mm), and Pieces. The 'Task Viewer' window is titled 'I1 WALLPANEL' and contains a diagram of the panel structure with various components labeled with letters (A, B, C, D, E, F, G, H, I, J, K, L). To the right of the diagram is a table with columns: ID, Name, Status, Profile, and Len(mm). This table lists 13 items, each with a checkbox, a letter, a name, a status, a profile, and a length.

At the bottom of the 'Task Viewer' window, there are buttons: 'View Piece', 'Select All', 'Select Error', 'Select Cancel', 'ReMake', and 'Accept'. The 'Select All', 'Select Error', and 'Select Cancel' buttons are circled in red.

On the right side of the interface, there are buttons for 'Feeding', 'Check Task', 'Edit Tasks', 'Append Task', 'Piece Pause', and 'Panel Pause'. At the bottom, there's a status bar showing '003 1.2mm 1000kg: 1,000,000 / 998,854 (mm)', 'Made:0mm/0', 'Queue:74,994mm/96', '0 mm/s', and a 'Step' button.

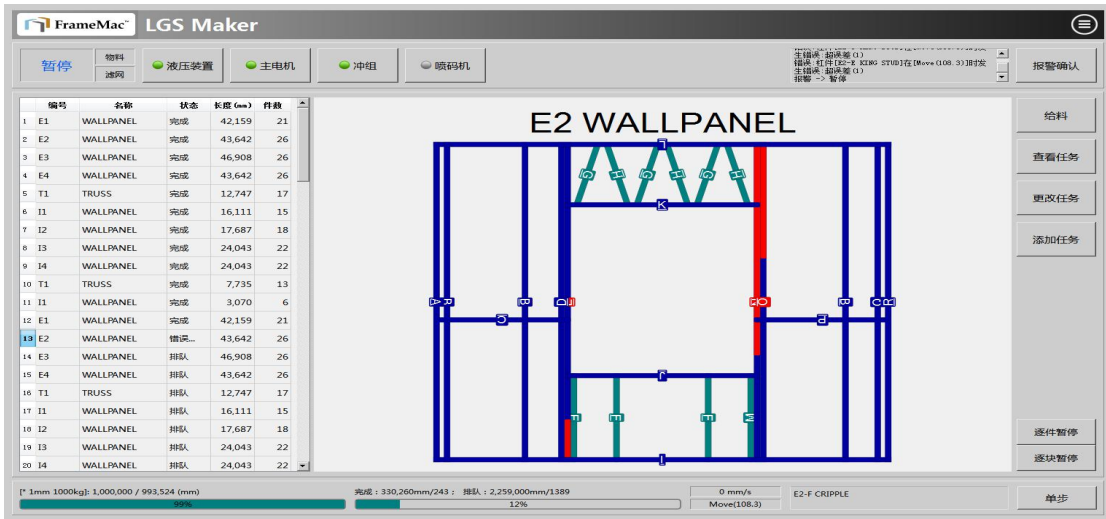
ID	Name	Status	Len(mm)
1	I1	WALLPA	
2	I2	WALLPA	
3	I3	WALLPA	
4	I4	WALLPA	
5	R5	ROOFP	
6	R6	ROOFP	
7	T1	TRUSS	
8	T2	TRUSS	
9	T3	TRUSS	

ID	Name	Status	Profile	Len(mm)	
1	H	INTERNAL B...	Makin...	FRM89-1.0	309
2	I	KING STUD	Makin...	FRM89-1.0	998
3	C	KING STUD	Queue	FRM89-1.0	998
4	F	HEADER	Queue	FRM89-1.0	430
5	D	INTERNAL B...	Queue	FRM89-1.0	309
6	K	DIAGONAL ...	Queue	FRM89-1.0	537
7	J	DIAGONAL ...	Queue	FRM89-1.0	538
8	E	BOTTOM TR...	Queue	FRM89-1.0	1,122
9	L	STUD	Queue	FRM89-1.0	998
10	G	TOP TRACK	Queue	FRM89-1.0	1,122
11	A	STUD	Queue	FRM89-1.0	998
12	B	TOP TRACK	Queue	FRM89-1.0	384
13	B	TOP TRACK	Queue	FRM89-1.0	384

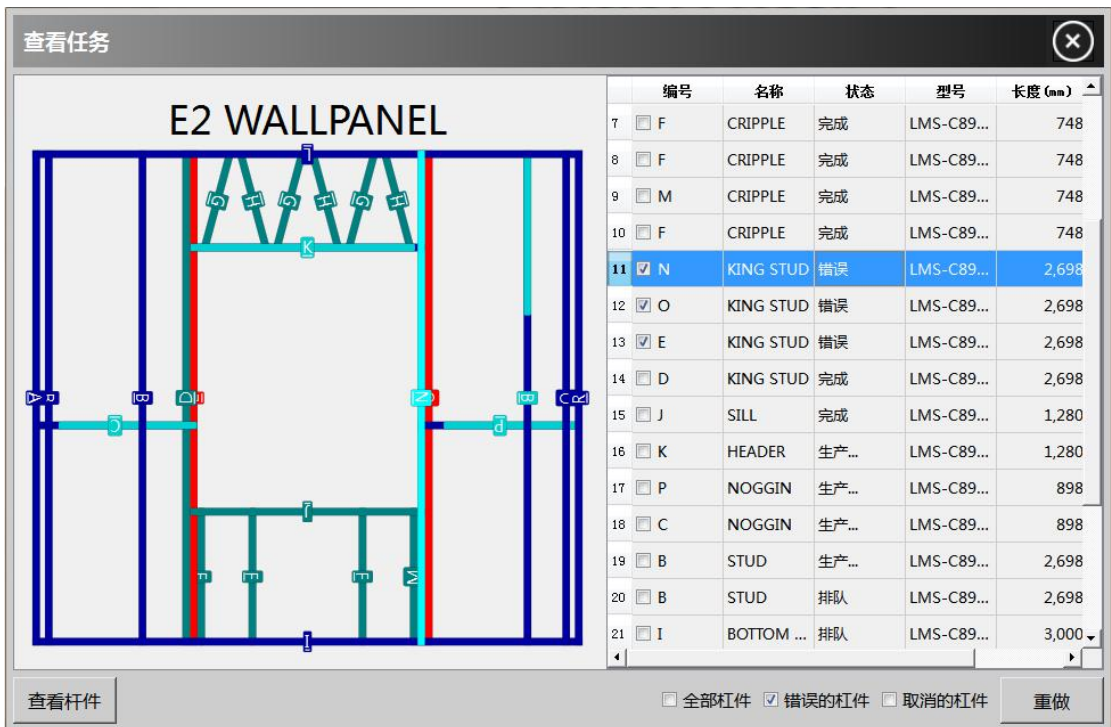
FrameMac LGS Maker production control system

Error bars redo

If there is error bar produced, the system may mark it in red.



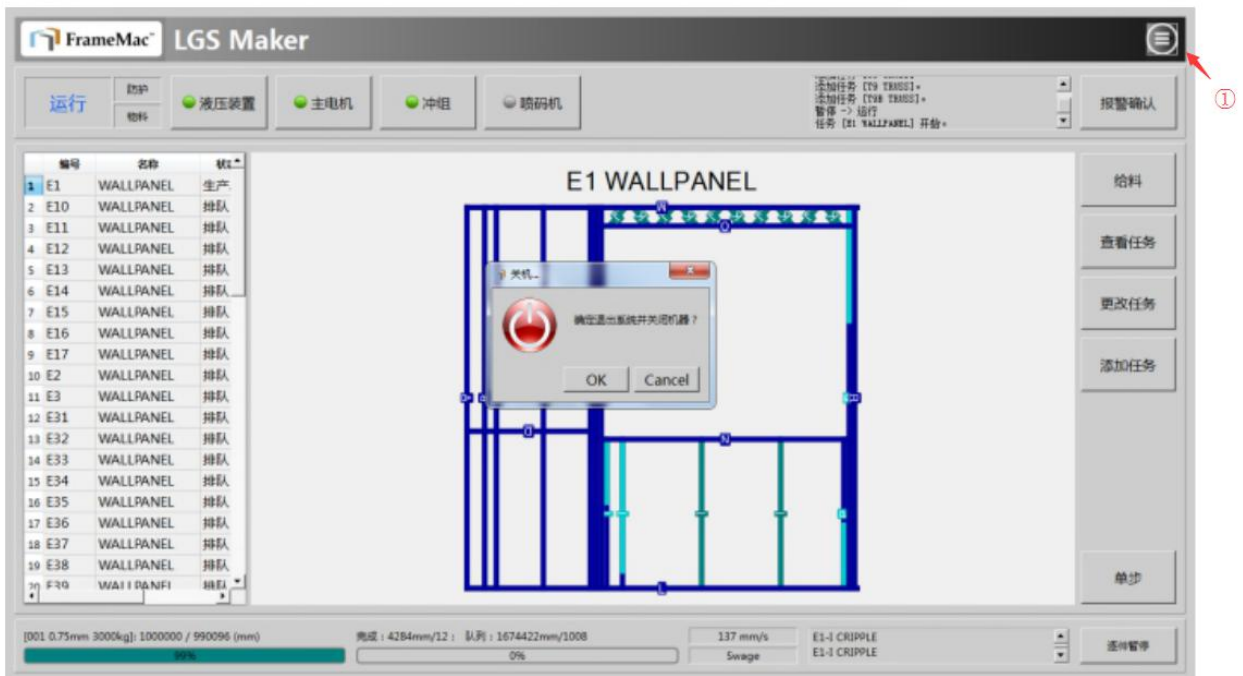
Click on “view the task” and choose “error bar”, then click on “redo”, the system will redo the error bar automatically.



FrameMac LGS Maker production control system

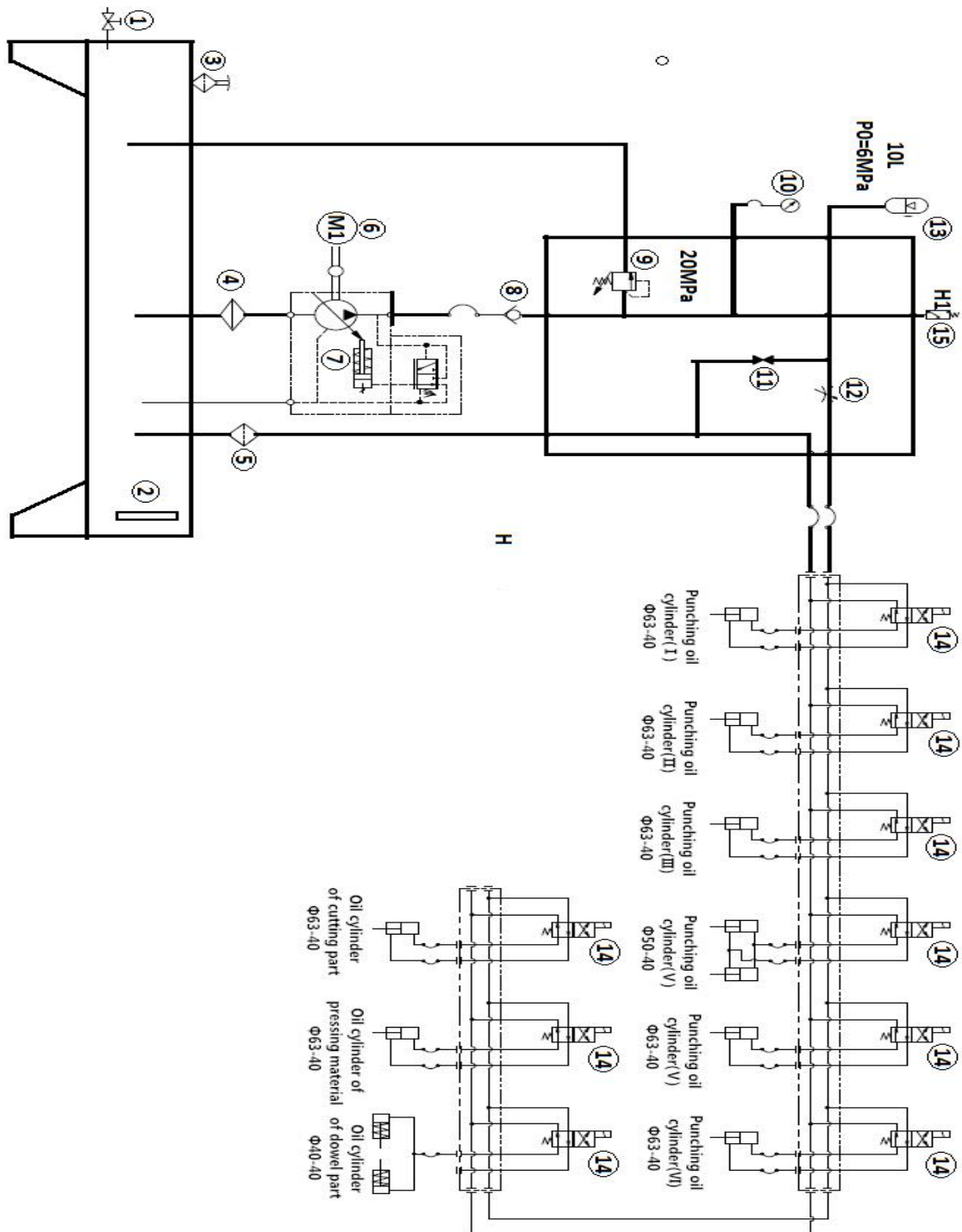
Shut down

After the processing task is completed, click on the button① , shut down the machine and computer. Then power off the main switch of the device.



Instruction of hydraulic system of sheet punching machine

Principle, list of main elements, system introduction, fault analysis, maintenance and requirements.



Hydraulic system

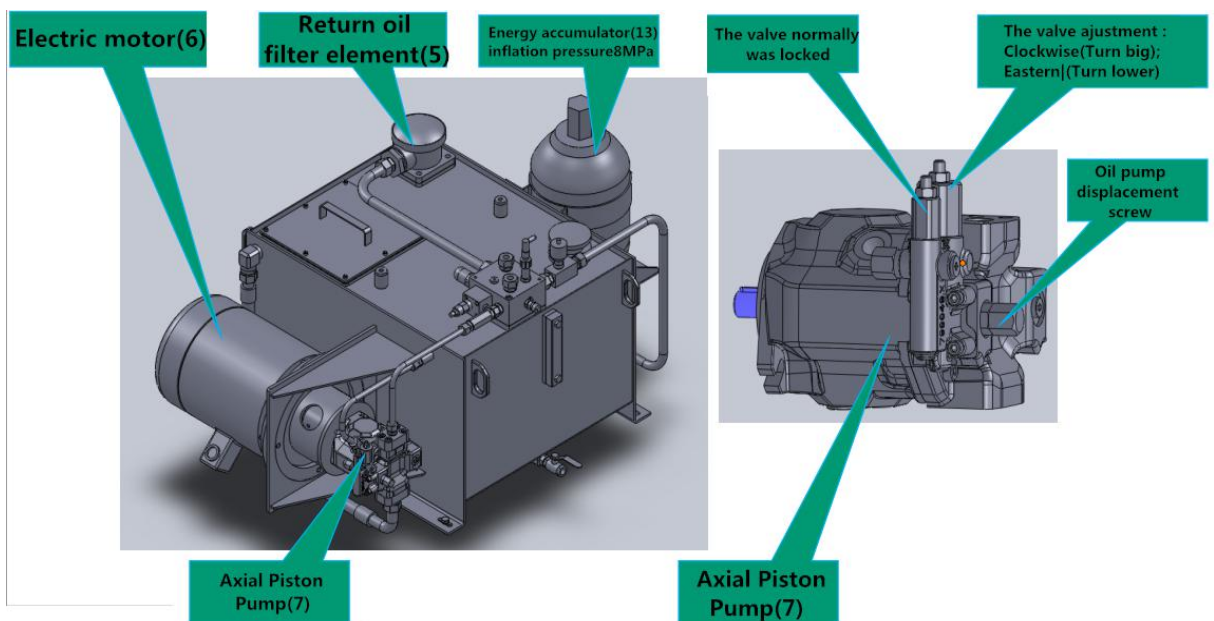
List of main elements

Item No.	Description	Model No.	Brand Name	Qty
1	Oil drain ball valve (coper material)	1/2"	LEEMIN	1
2	Level gauge	YWZ-150T	LEEMIN	1
3	Air filter	EF5-65	LEEMIN	1
4	Strainer mesh	W-U-100-80-J	LEEMIN	1
5	Return oil filter element	RFBN/HC110DC 20B1.X/B6	HYDAC	1
6	Electric motor	M2QA-132S4A (5.5KW)	ABB	1
7	Axial piston pump	A10VS028DR/3 1R-99A12N00	REXROTH	1
8	Check valve	S10A1.0	REXROTH	1
9	Overflow valve	DBD6K-1X/315	REXROTH	1
10	Pressure meter	YN-63-IV40	LEEMIN	1
11	Globe valve	DVP-08P-PM	HUADE	1
12	Throttle valve	MG10G1X	REXROTH	1
13	Energy accumulator	NXQ-A-6/20-L-Y	AOLAIER	1
14	Magnetic exchange valve	4WE6D-6X/EG2 4N9DKL	REXROTH	9

Hydraulic system

Introduction

1. The system uses constant pressure automatic unloading bearing design, its principle is: driven by a motor, the constant pressure variable pump(7) works with the accumulator(13)pump, discharge of variable pump automatically lowers to 2% of the oil pump's specified discharge, allowing the system to maintain a stable pressure, greatly reducing the reactive power loss of the system, and reducing the heating of the system as well.
2. Oil return of all elements of the system share the same line and on the line returning oil filters(5) are installed to filter and clean all the returning oil so as to greatly reduce abrasion of the elements



Hydraulic system

Introduction

3、 The system is equipped with a safety relief valve (9), the function of which is to avoid any damage or accidents caused by the infinite pressure resulting from the failure of constant pressure variable pump (7); adjusting the valve clockwise will increase the pressure, and counterclockwise adjusting decreases the pressure; normally the valve regulating pressure is 1.3 times of the set pressure of variable pump (system pressure), for example, if the set pressure of variable pump (pressure) is 14MPa, the valve set pressure shall be 18MPa.

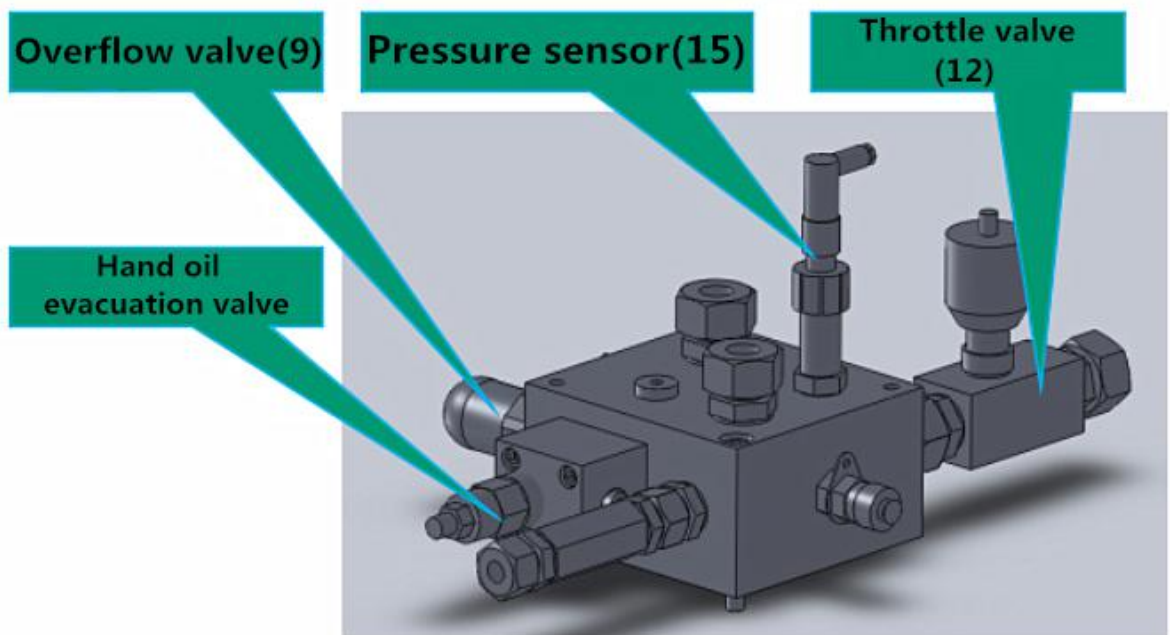
4、 The system is equipped with a manual drain valve (11), the function of which is the system pressure can be released manually when system maintenance, disassembly or detection of the accumulator (13) pressure is necessary. When the system is in normal work state, the valve is closed. Screw the valve clockwise to close and counterclockwise to open, and when the valve is open you can see the system pressure slowly reduce from the set pressure to 0.

5、 The system is equipped with speed control valve (12), the function of which is to regulate the working speed of the actuating cylinder. Screwing the valve clockwise to decrease the speed and counterclockwise to increase the speed.

Hydraulic system

Introduction

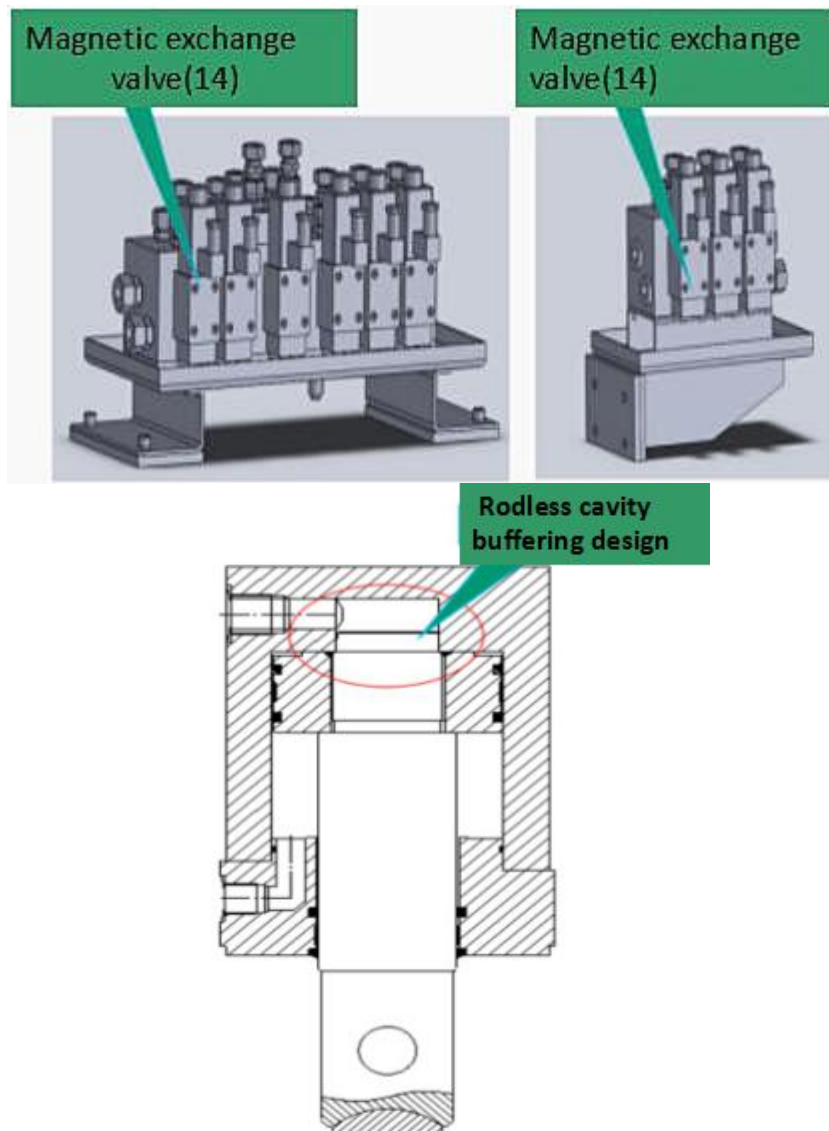
6、 The system is equipped with a pressure sensor (15) to detect the real-time pressure of the system and display it on the control panel.



Hydraulic system

Introduction

7、 The actuating cylinders move under the control of the two position four way solenoid valve (14) . When the solenoid is powered on, corresponding actuating cylinder shears and when the solenoid valve is powered off, the cylinder resets.



Hydraulic system

Fault analysis

1、 Pressure fault: pressure fault and non pressure fault.

1.1、 Pressure fault : there is pressure in the system , but you can see the standby pressure on the pressure gauge with frequent swing up and down, or a power system pressure of unloading to 0 within 1 minutes, and can judge that the oil pump is working all the by sound (whether there is work or not in the cylinder), from which you can determine that a manual drain valve is open (11) or cannot be closed. Screw the regulating handle clockwise to the end to close, if you have screwed it to the end and has no effect, this valve is broken and must be replaced, otherwise, the system will be overheated and the elements will be burnt out.

1.2、 Non pressure fault: there is no pressure in the system, the cause may be: a、 manual valve(11) is completely open or broken, in this case, screw the regulating handle clockwise to the end to close. b、 pressure regulating valve of the oil pump is completely open or broken, in this case, screw the regulating handle clockwise to check whether the pressure increases or not. Attention: when the pump is operating normally one of the regulating valve is completely closed, see the instruction. c、 The inflation pressure of accumulator is insufficient.

Hydraulic system

Fault analysis

To detect whether the pressure of accumulator is sufficient or not when there is no pressure in the pressure gauge. d、 The safety relief valve (9) is open or broken, in this case, screw the regulating handle clockwise to check whether the pressure increases or not. e、 The failure of the oil cylinder. Check whether there is an oil cylinder damage (sealed element damage). If without connecting the valve, the pressure is normal, but abnormal when the valve is connected, the fault is determined.

2、 No action fault :

2.1、 If there is pressure in the system, but a certain cylinder doesn't work, please check whether the solenoid valve controlling the cylinder is stuck or broken (manually operate this valve to check), if manual operation works while electric operation doesn't work, check whether there is loosening in the plug or broken line.

2.2 There is pressure, but all actuating cylinder doesn't work or can't wear the plate, please check whether the pressure is sufficient or not.

Hydraulic system

Fault analysis

3、 The system generates unusual heat of no reason: The system is working properly and suddenly becomes overheated while the pressure and operation are normal, from which you can determine the manual oil discharge valve (11) handle is loosened or not closed, screw the regulating handle clockwise to the end to close . If you have screwed it to the end but it doesn't work, it means that this valve is broken this valve is broken and must be replaced, otherwise, the system will be overheated and the elements will be burnt out.

Hydraulic system

Maintenance

1. Inspect the oil level in the tank regularly, if the level is below the oil standard median line, refill to the 90% of the oil leveler immediately. The volume bulk of the tank is: 120L. When the oil level is under the limit range, don't startup the oil pump.
2. After installation and 500 hours' operation, the first refilling is a must. From then on, refilling after 2000 hours' operation. All hydraulic oil shall meet relevant specifications. 46# antiwear hydraulic oil shall be used and 32# antiwear hydraulic oil shall be used in the north. Tank shall be completely cleaned before refilling. And the hydraulic oil refilled must be filtered.
3. Temperature of the tank: better between 15-50, no higher than 60 or lower than 5. Too high oil temperature may cause leakage or spoiling, the oil pump's bulk effectiveness decreases. Too low oil temperature may cause difficulty in startup and pumping of oil and damage to the parts. In winter, the oil temperature is very low, startup the oil pump and idle the machine for several minutes then operates.
4. Clean the filter in the oil-in end with gasoline or chlorylene. Timetable of cleaning: first clean it when the machine comes into service, then clean it every month. If the filter is badly broken, replace it.

Hydraulic system

Maintenance

5. Air cleaner is fixed in the box and must be cleaned with gasoline or chlorylene for the first time 60 days after the cleaner comes into service, then clean it every 120 days.
6. If there is leakage at the union coupling, tighten it or replace the seal elements.
7. Inspect whether there is any loosening of the fastening piece or any abrasion of the lead rail, if there is any unusual case, correct it.
8. The adjustment of safety relief valve(9) is to ensure the safe production of the device and is very important. Safe pressure shall be set to 20MPa and the maximum pressure for system operation shall be set to 16MPa. Any damage caused by the pressure beyond that limits, this company bears no responsibility.
9. Attention: Never fill the accumulator with oxygen, compressed air or other flammable or reactive gas, otherwise, there is a risk of explosion. Fill the accumulator with nitrogen slowly to avoid breaking the capsule.
10. If the system fails to work and needs repair or removal, the, open the manual oil discharge valve (11) slowly first to release the accumulator storage energy completely, only when the pressure gauge shows the oil pressure is 0 MPA can you remove the device, otherwise, it can be dangerous to the personal and equipment safety.

Hydraulic system

Maintenance

11. After the device starts working, check the pressure of the accumulator once a week at the beginning, one month later, once a month; and half a year later, once half a year; and a year later, once a year.

12. If you want to repair the accumulator, you must loosen the manual oil discharge valve (11) regulating handle completely to discharge the pressure oil release nitrogen with pneumatic tools and then remove the device.

13. Warning: the filling, releasing, inspecting and maintaining and other operations must be conducted by experienced personnel, before the operation, read the accumulator usage manual and Pneumatic tools manual carefully.

Hydraulic system

Requirements

1. This system is powered by 380V 50HZ three phase alternating current, and the control electric pressure of solenoid valve is DC24V.
2. To avoid excess voltage drop caused by peak current, incoming line and its connecting must be reliable.
3. Before connecting the power supply, please check whether the voltage and frequency of power supply conforms the requirements of the machine. The permitted variable range of the voltage is $\pm 1\%$.
4. General parameters of the system:
 - Control voltage: DC24V
 - Temperature: -5 to 40
 - Humidity: 35-95%, no dew
 - Height: no higher than 1000meters

Equipment maintained table

NO.	COMMENT	WEEK 1							WEEK 2							WEEK 3							WEEK 4						
1	Vacuum up waste collection boxes																												
2	Punching device Lubricating																												
3	Cleaning roller set																												
4	Clean up the surface of the machine																												
5	Check the lubricat situation of all machine																												
6	Cleaning the punching device																												
7	Check height positions of Hydraulic oil																												
8	Add lubricat oil for roll bearing																												
9	Add lubricat oil for gear device																												
10	Checking the locking situation of all the nut screw																												
11	Add lubricat oil for decoiler's bearing																												