WC67Y-40TON/1600 PRESS BRAKES

OPERATION MANUAL

Nominal Pressure: 400 kN

Length of Table: 1600 mm

Delivery No.:

Contents

This operate manual is for this series of press brake. operator should read this operating manual carefully. And then operate the machine according to connected specification. type and technical date.

For the safety of yourself, you must take care of following:

Danger position of operating:

Ram, the area between top die and lower die, the medial of vertical column, electrical parts and so on. You must pay attention to these parts.

Hoist Position:

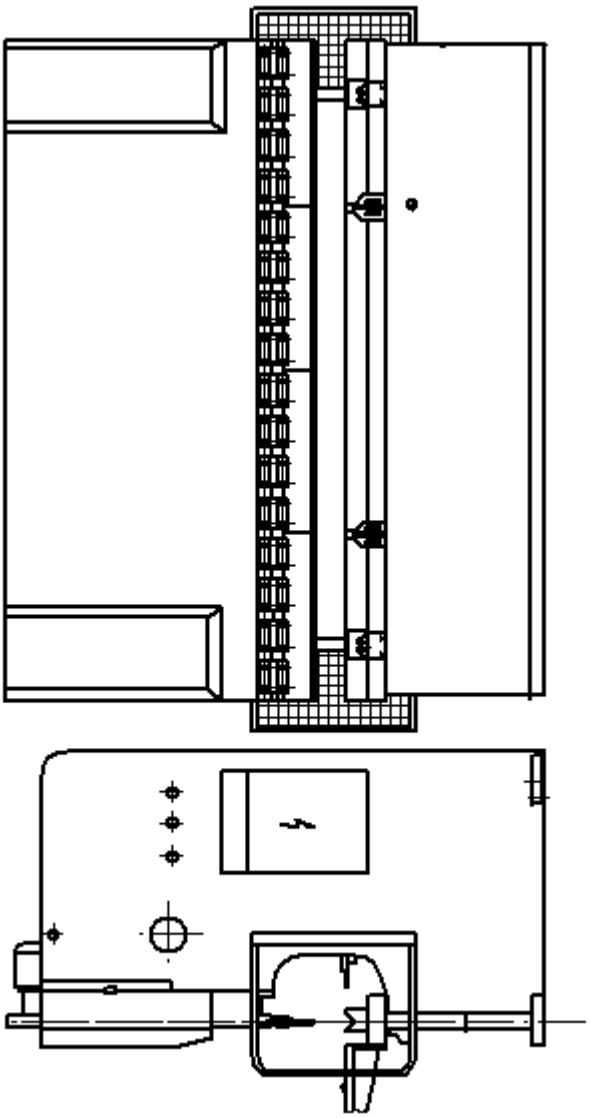
The center of the machine is partial. You must find the correct position when hoisting.

Using:

This machine must install on the solid floor. It can be operating after adjusting level.

1. Outline photo of the Machine

(The external drawing of the machine is for your reference only and subject to practical products.)



2. Fundamental Data

No.	Name		Valve	Unit	Remark
1	Nominal Pressure		400	kN	
2	Working table length		1600	mm	
3	Distance between uprights		1050	mm	
4	Throat depth		200	mm	
5	Stroke		100	mm	
6	Distance table/ram		340	mm	
7	Max. stroke of block		100	mm	
9	Speed for slide Stroke	Approach	65	mm/s	
		Working	8	mm/s	
		Return	60	mm/s	
10	Oil pump	Type	NT3-G10F		
		Flow	10	ml/r	
		Pressure	32	MPa	
11	Main motor	Type	Y122M-4		B35
		Power	4/5.5	kW	
12	Motor for adjusting slide block	Type	AO2-6324		
		Power	0.18	kW	
13	Motor for adjusting back gauge	Type	Y802-6		
		Power	0.3	kW	
14	Overall dimension	L	1750	mm	
		W	1600	mm	
		H	1800	mm	
	Max, working pressure for the hydraulic system		25	MPa	

3.Main Application and Main purpose

This machine is used to bend various kinds of metal plates. This machine is widely suitable for manufacturing aeroplanes, ships, automobiles and electric appliance, owing to its high efficiency in production. With different dies provided, the subscriber can get the metal plate bent into different shapes of work pieces. And it can also be used for punching when adequately equipped.

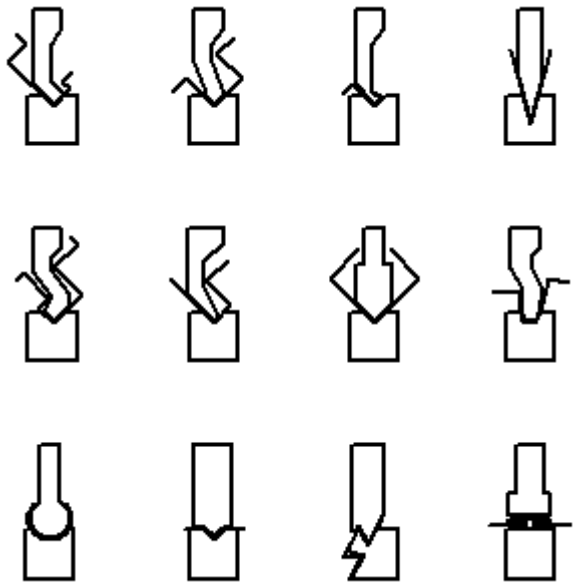


Fig.1 Typical the diagram of bending

4.Functions and Features

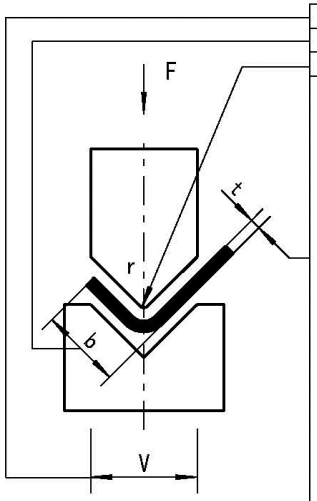
This machine possesses the high efficiency of production and certain accuracy in bending metal plates.

It is necessary to select upper die of different shape and lower die with different width V-groove for bending steel plates of different thickness, shape or size.

With the help of the bending pressure chart or the calculating formula, the bending pressure can be figured out.

By adopting hydraulic driving, it is possible to prevent serious overload accidents caused by changing of plate thickness or by inappropriate selection of V-shaped lower die, The machine is characterized by smooth running, little noise and easy operation, and its rated pressure in the whole working process is maintained stable.

PRESSURE TABLE FOR METAL SHEET BENDING



t \ V	4	6	8	10	12	14	16	18	20	24	28	32	36	40	45	50	55	60	65	70	80	90	100	120	160	200	250
b	2.8	4	5.5	7	8.5	10	11	12.5	14	17	20	22	25	28	31	35	38	42	46	49	56	63	70	85	113	140	175
r	0.7	1	1.3	1.6	2	2.3	2.6	3	3.3	3.8	4.5	5	6	6.5	7	8	9	10	10.5	11	13	14	16	19	27	33	42
0.5	40	30																									
0.6	60	40	30	30																							
0.8		70	50	40	40																						
1		110	80	70	60	50	40																				
1.25			130	100	90	70	60	60	50																		
1.5			180	150	120	110	90	80	70	60																	
1.8				210	180	150	130	120	110	90																	
2					220	190	170	150	130	110	90																
2.5							250	230	200	170	150	130	110														
3								330	290	250	210	180	160	150	130												
3.5									400	330	290	250	220	200	180	160											
4										440	370	330	290	260	230	210											
4.5											470	410	370	330	300	270	240										
5												510	450	410	360	330	270	250									
6															520	470	430	390	360	340	300						
8																		700	640	600	520	460	420				
10																					810	720	650				
12																							950	780	590	470	
14																							1300	1100	1100	650	520
16																							1400	1400	840	680	
20																								1600	1300	1100	
25																									2100	1700	

The value of the table the pressure L=1m
For instance:
t=4mm
L=1m
V=32mm
so:
F=330kN

Formula:

$$F=\frac{650t^2L}{V}\ kN$$

t—The thickness of plate mm

L—The width of plate m

V—The open of ower die mm

Note:1,The formula and the value is calculated subject to σb=450MPa
2,If the strength of sheet is different, the pressure can be calculated according to the following co-efficiencies:
soft brass 0.5 stainless steel 1.5
soft aluminum 0.5 shrome aluminum 2.0
3,The choice of die opening:the 8-10 times thicker than the metal sheet

5. General View and Descript

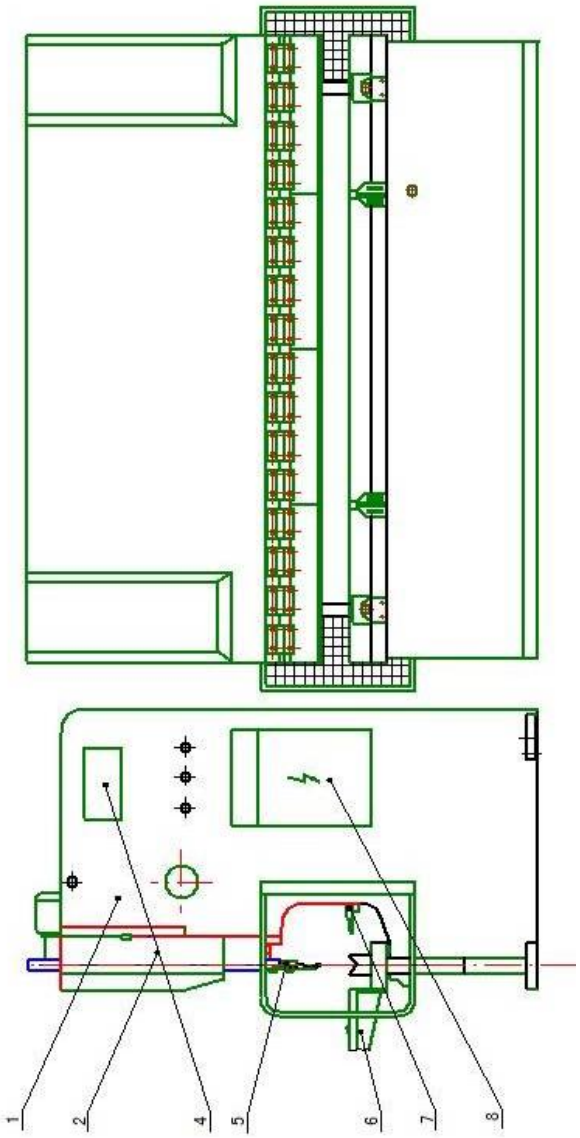


Fig 1 General view of the machine

1.Main frame 2.Ram mechanism 3.Synchronous mechanism 4. Hydraulic system 5.Upper and lower dies 6.Extension arm(front) 7.Back gauge 8.Electrical system 9.Dies

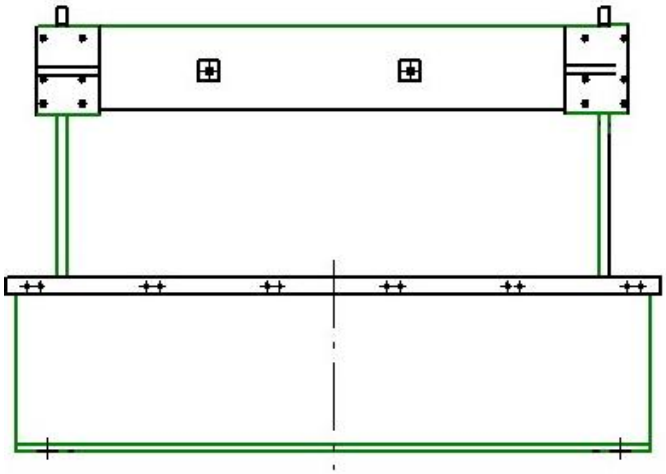
The machine assumes a form of upper driving with cylinder hydraulic pressure. It is easy to operate, and reliable to work. According to the reselected requirements, tread down the pedal electric switch which causes the ram to act in 3 different ways: single motion, jog motion, and continuous motion.

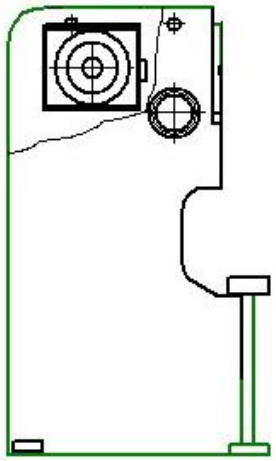
6. Machine's Structure

Main parts of the machine are made of steel plates joined together by welding, which ensures its high density, fine rigidity and lightness in weight. It is composed of the following parts:

(1)Framework

The rack-shaped framework is composed of left and right sides made of steel plates, oil tank and props. The working table is placed between the left and right sides at a lower position with two semicircular spacers among it.





The ram is made of a whole piece of steel plate. It is connected with piston rod.

Oil cylinders are fixed on the upper part of the left and right sides. The ram is moved up and down by the piston driven through hydraulic pressure.

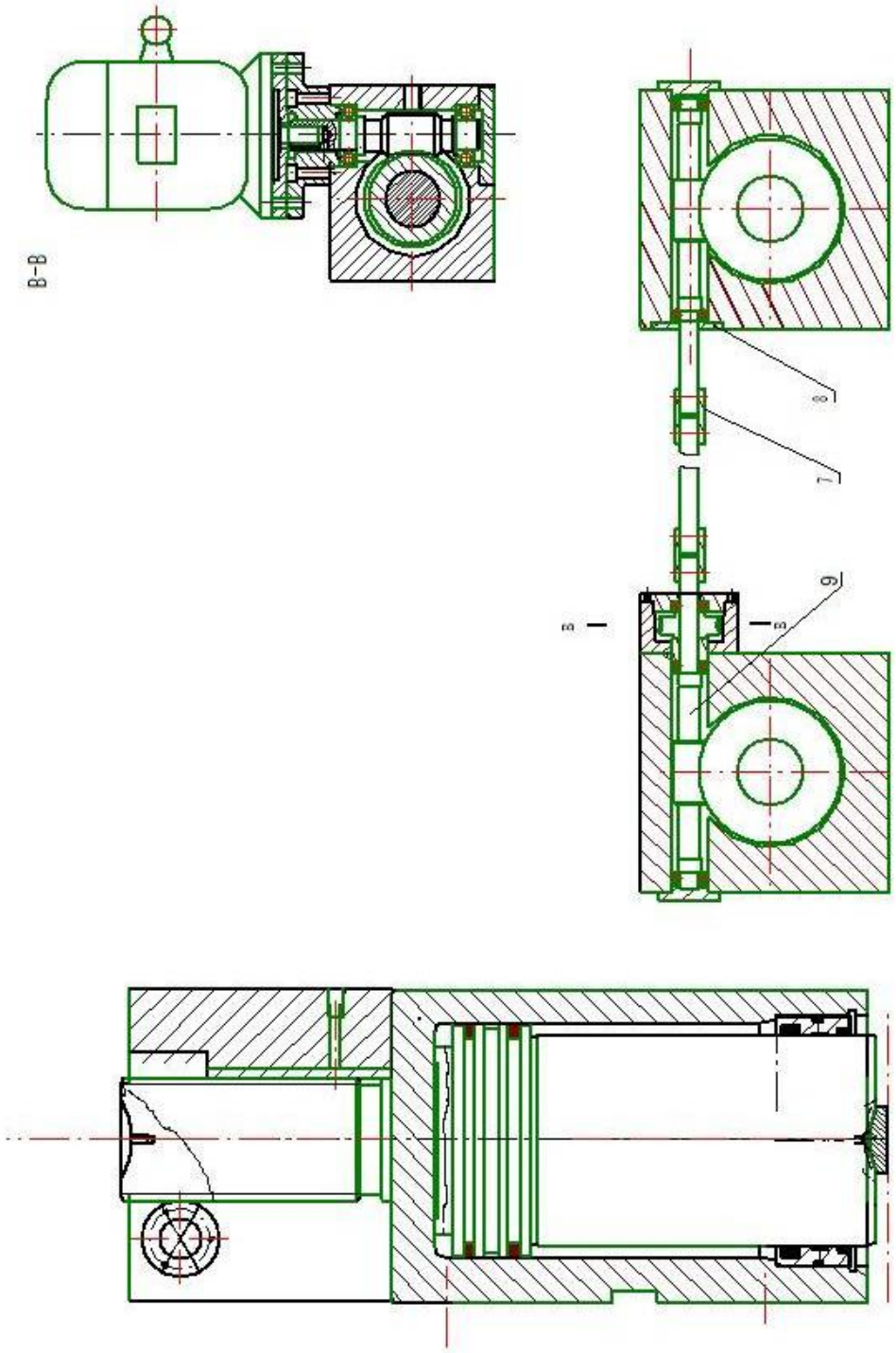


Fig 3. Assembly drawing of stroke adjustment for the ram

(3)Synchronous mechanism

The mechanical forced synchronous mechanism is made of seamless steel tube, it is simple in construction and convenient for maintenance. It possesses a certain precision of synchronism.

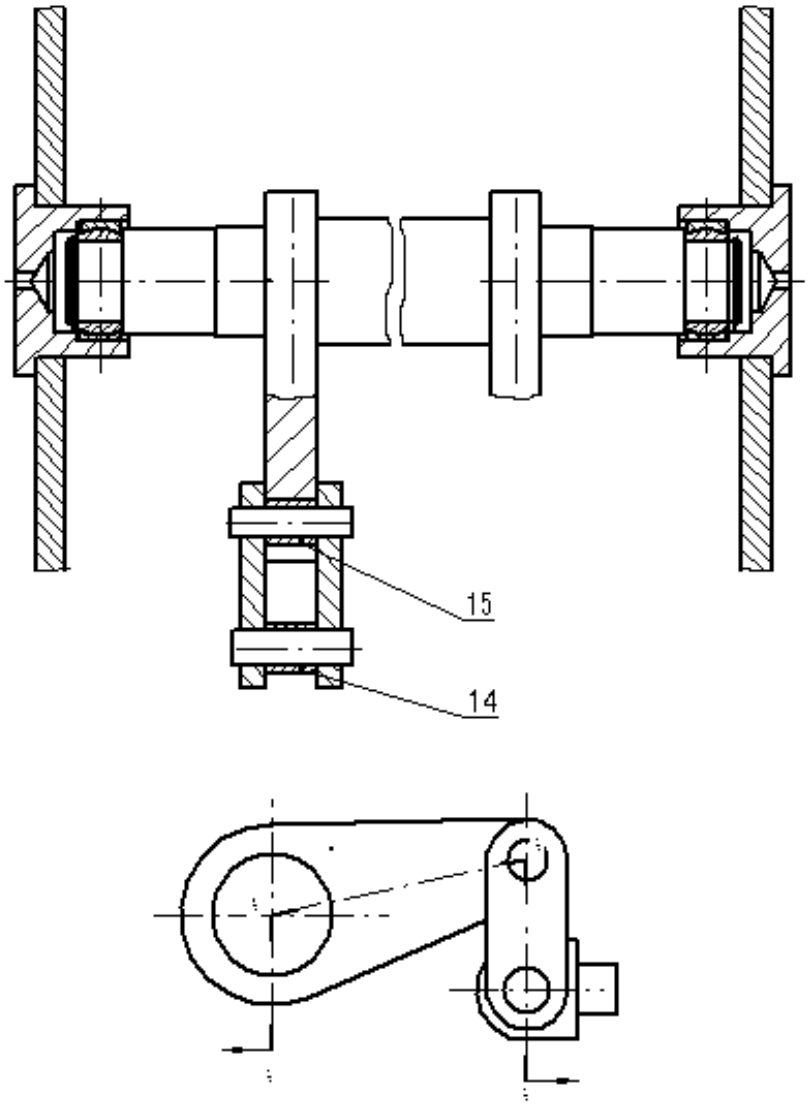


Fig.4 The Assembly of Mechanical Coerced Synchronous Mechanism

(4)Hydraulic system

Motor, pump body, and valve board are installed on the middle prop, over which an oil tank is mounted to fill oil easily.

Oil pipe line made of seamless steel tubes ensures free flow of oil in any part of the hydraulic system.

Oil is filtered by two time in order to be kept clear.

（5）The mechanism of fore support.

It is used to place the workpieces or to block the plate cut.The front side of our machine tool table has a full length of T-slot, which can facilitate the left and right movement of the front support. It is more convenient for workers to operate.

(6) Back Gauge

The X-axis value is controlled by the E21 system. And the forward and backward of the baffle is driven by the motor. For better accuracy and speed. We installed the frequency converter in the electrical cabinet. In addition, the transmission of the baffle is provided by gears and synchronous belts to provide the stability and precision of the transmission. The front and rear motion units are composed of a high-precision ball screw and two smooth circular guide rails. The numerical feedback is provided by the encoder, and the error between the actual data and the displayed data can be adjusted in the system.

(7) Back gauge

Alignment support for sheets. Can turn around the axis to prevent workpiece from damage during bending.

(8) .Electrical system

The electrical system is designed according to electrical standards, and the products of French Schneider Company are mainly used as electrical components.Special voltage configurations are available upon customer request. Such as 380V/50HZ, 220V/60HZ, etc.

(9) Dies: Upper die is set on the ram with the help of the press board. According to the need of the workpiece, upper die of different length is selected or several upper dies are put together to form a certain length. Lower die with die pad is placed on the working table. By using the knobs,the lower die can be moved forward and backward to align with the centre of the upper die.

Hoisting circle,Which is hung on the bolt of lower die or put in te toolbox when unused is used to lift lower die.

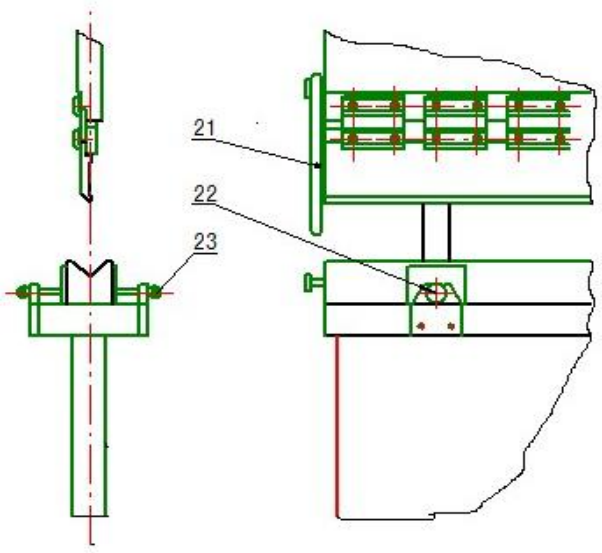


Fig.9 The assembly of back gauge

7. ELECTRIC SYSTEM OF THE MACHINE

A. Brief introduction:

The supply source for this machine is 220V,60Hz,3ph Ac. control voltage, electromagnetic valve voltage,110V,24V, are supplied by control transformer.

QF air-break switch has short circuit protection and M1 overload protection.FU1 is M2 short circuit protection;FU2 is M3 short circuit protection: FU3 is TC short circuit protection; FU4 control power's short circuit protection; FU5,electromagnetic valve power's short circuit protection.

QF air-break's "off" and "on" are interlocked with the door of electric box. Only with air-break "off", the door can be opened.

There are good earth wires for each motor and each electric box. Operators must earth the stable earth connection onto the electric box's earth plate to keep safety.

B. Start the machine and preparations for operation:

1. Connect the power wire to power inlet's phase in electric box, and the earth line.

2. Connect the socket connector of foot-switch to electric box.

3. Close the electric box's door, power on the supply source.

4. Open button of foot-switch and urgent-stop button, power on the control source by key-switch .HL1 lights.

5.Press SB3,oil pump starts,HL2 lights.

6.Note the oil pump's rotating direction, It is in the same direction to the arrow of oil-pump, otherwise stop immediately the machine. Change power inlets' phase and correct the rotating direction.M1 motor's wire splice can't be changed. Otherwise it would damage the machine's working.

C. About details of action adjustment for the machine, please reference to the attachment operating construction for E21.

D. Principle drawing of Electricity Please reference to the attachment the control return for CNC Press Brake.

8.HYDRAULIC SYSTEM OF THE MACHINE

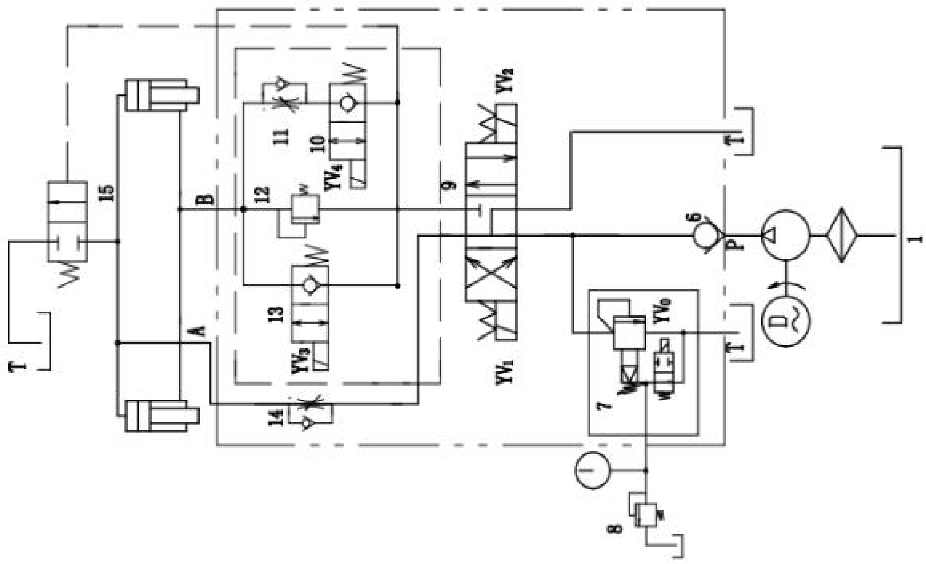
The hydraulic system working principle.When oil pump is running, oil feed-out, through oil pipe into valve plate and solenoid valve then returns into oil tank. Here solenoid valve isn't work.

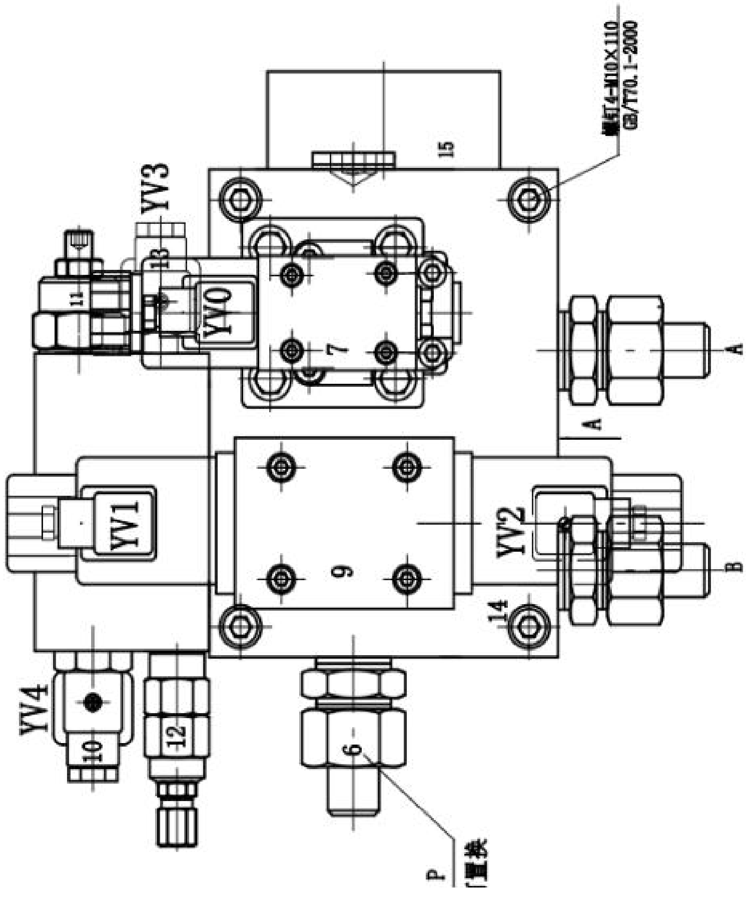
Quick down: After stepping on the foot switch, the solenoid valves YV0, YV2, YV3, YV4 are energized to work. At this time, the hydraulic oil enters the upper chamber of the oil cylinder through the three-position four-way valve, and the hydraulic oil in the lower chamber of the oil cylinder opens at the same time with YV3 and YV4 to quickly flow oil into the oil tank. The slider will drop quickly.

Slow down: in the process of fast down, when the switch is touched. When the solenoid valve YV3 is de-energized, the hydraulic oil in the lower chamber of the cylinder will only flow back to the fuel tank through YV4. At the same time, there is a relief valve above the YV4 to control the flow. At this point the slider will slowly descend.

Return: After the workpiece is bent, step on the foot switch to trigger the return signal. Solenoid valves YV0, YV1 are energized. The oil enters the lower chamber of the cylinder through the three-position four-way valve, and pushes the cylinder to return. At the same time, the hydraulic oil in the upper chamber of the cylinder will flow back to the tank. At this time, the slider will quickly return to the top and contact the travel switch.

The overflow valve No.8 adjust return pressure, the pressure should control within 12Mpa.

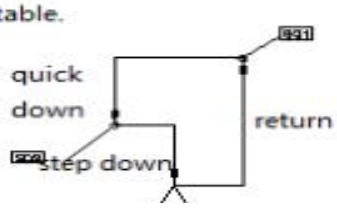



YV1
YV2
YV3
YV4
YV0

movement / execute component	slider free run	slider quick down	slider slow down	return	relief
YV0	−	+	+	+	−
YV1	−	−	−	+	−
YV2	−	+	+	−	−
YV3	−	+	−	−	−
YV4	−	+	+	−	−
SQ1	+	−	−	−	−
SQ2	−	−	+	−	−

Description: relief pressure to stay 1-2 seconds delay relay can be adjusted.

15 check-valve selection of liquid "a / b" level spring, adiustable.



NO	Name	Model		Q.	Remark
15	Cartridge two-way valve	Ø63		1	
14	choke	Ø3		1	
13	Threaded plug-in solenoid valve	DHF-10-220	7/8-14UNF-2B	1	
12	Threaded plug direct relief valve	YF-08-00	3/4-16UNF-2B	1	
11	Threaded plug throttle	LF-08	3/4-16UNF-2B	1	
10	Threaded plug-in solenoid valve	CSV-02	3/4-16UNF-2B	1	
9	magnetic exchange valve	4WE 10F31/CG24N5 L		1	
8	overflow valve	YF-L8H4		1	
7	Electromagnetic relief valve	DBW10B-1-50/ 31.56CG24N5L		1	
6	One-way valve	S10A		1	
5	Pressure gage	YN60	0~40MPa	1	
4	Motor			1	
3	axial piston pump			1	
2	Screen filter			1	
1	Oil tank			1	

9.Hoist and Conveyance, Installation and Preparation before trial run

(1)Hoist

The centre of gravity of the machine is a bit higher, the forepart and the rear-part are not balanced in weight. so, in process of hoisting, conveying and installing, the centre of gravity should be properly positioned to prevent the machine from turning over.

We recommend that you adopt a crosswise pole in lifting the machine so as to prevent its precision from being disturbed.

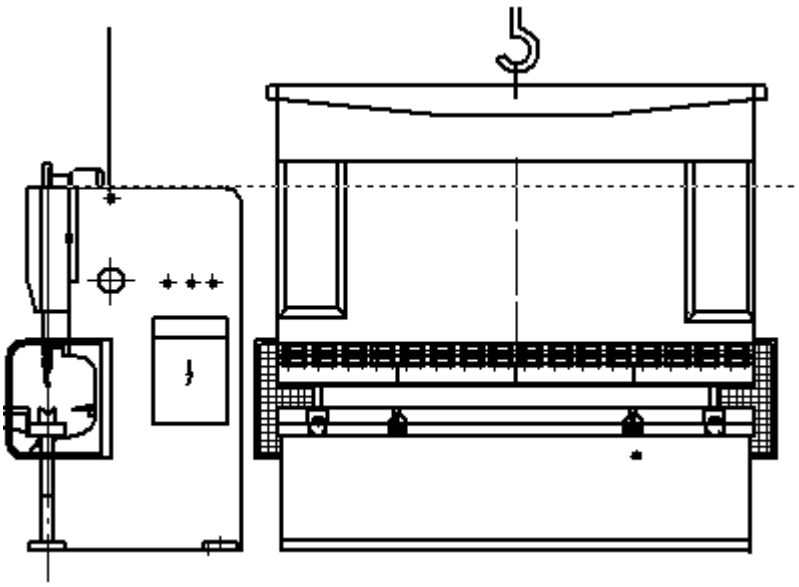


Fig.12 Diagram for hoisting

(2)Installation

The surface of the working table is taken as the basic plane for level measuring, with a tolerance of ⩽ 1000:0.30mm,both longitudinal and transverse.

Install the machine on the foundation, and then fix the foundation boats, and do the final second grouting, After the cement has been solidified, check and correct the level of the machine.

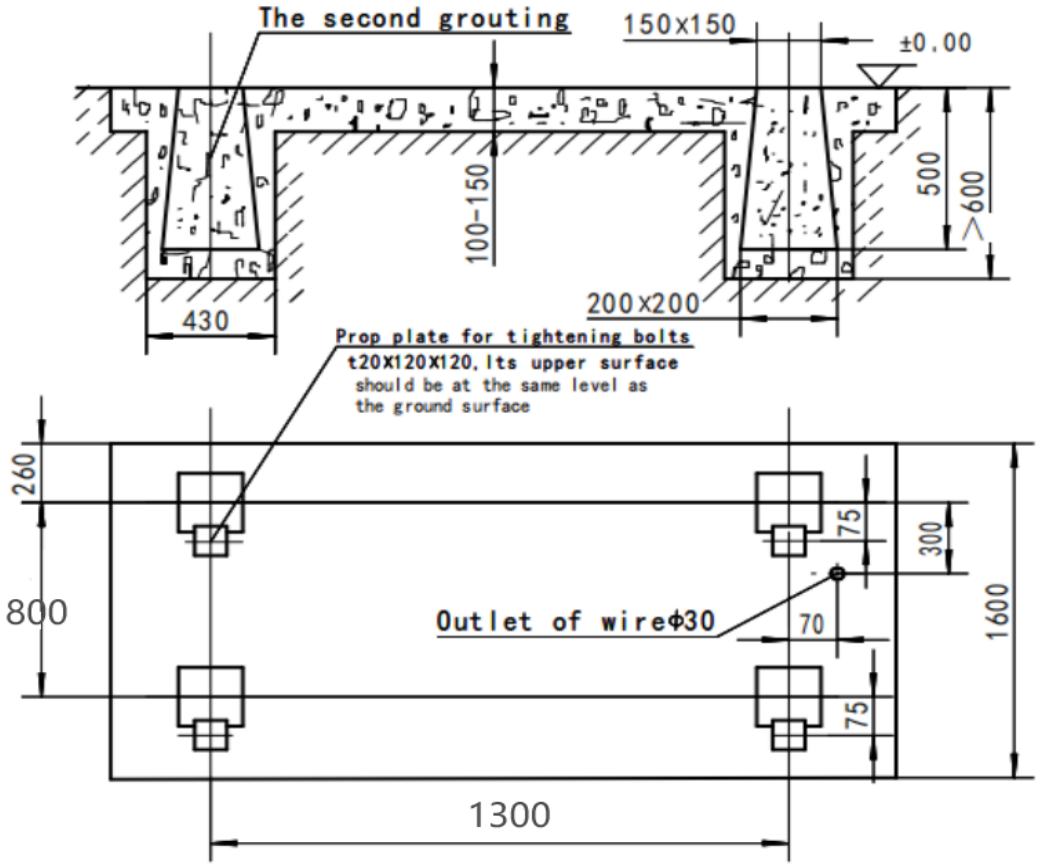


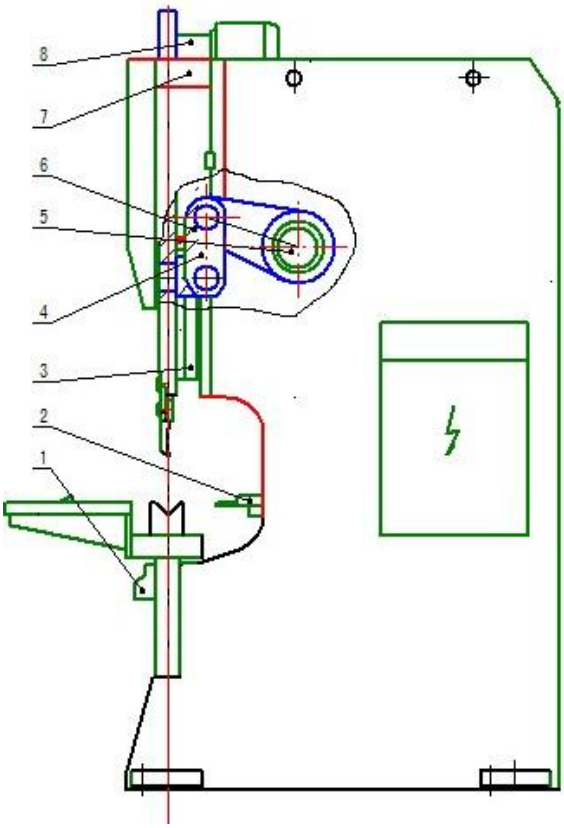
Fig.13 Diagram of Foundation

10. Lubrication System

This machine is adopted individual lubrication.

According to working conditions, with reference to the lubricating points on the lubrication board, lubricating oil or grease is applied.

Grease is provided in the upper worm gear of the oil cylinder. Replenishment or replacement is carried out in terms of working conditions.



No.	Name of lubricating point	Oil site count	Oiling time	Brand of lubricant
1	Digital indicator(back gauge)	2	48hours	Machine oil 46#
2	Slide (back gauge)	4	48 hours	Calcium base grease ZG-3
3	Guide way	2	4 hours	Calcium base grease ZG-3
4	Ram props	2	4 hours	Calcium base grease ZG-3
5	Torsion-bar bearing	2	8 hours	Calcium base grease ZG-3
6	Connecting rod(right & left)	2	4 hours	Calcium base grease ZG-3
7	Worm gear box	1	500 hours	Calcium base grease ZG-3
8	Digital indicator(up fine adjustment)	2	48 hours	Machine oil 46#

Note: you should mix Calcium base grease with 50% of machine oil 46#, when lubricating the machine with it)

Fig.14 Schematic diagram of lubricating points

11. Trial run and Operation

Before trial run, all lubricating points should be lubricated with grease. At the same time fill the tank with No.30 hydraulic oil.(change oil one month later for the first time, and then do the replacement every year according to conditions. The lowest temperature should be kept above 10℃)

During the first trial run, it is advisable to operate the machine with "jog motion" to see if everything is all right. then "single motion "and" continuous motion" can be tried, the ram travel, the control of back gauge and the function of the solenoid relief valve can be tested. when the machine is proved to be all right, operation can be carried on according to the following procedure:

(1)Calculate or check the bending pressure and the opening width of the lower die.

(2)Align the centers of upper and lower dies.

(3)Set the ram travel.

(4)Determine the positions of fore-arm and back gauge.

(5)Determine the positions of upper and lower bumpers.

(6)Determine the operation mode of "jog motion", "single motion" or "continuous motion".

(7)Place the workpiece in the middle of the working table and make pressing trial.

(8)Re-adjust the ram travel, or the wedge of the upper die. Keep sufficient spare parts in storage.

Pay attention to sealing conditions if any leakage is found, replace the sealing part in time.

The accuracy of the machine after undergoing an overhaul should be kept to the standard before delivery(see Quality Certificate).

Notice:

(1)The machine is not suitable for single-sided load, which may affect: bending plates and the accuracy of the machine. In case of need, single-sided load is permitted smaller than 150KN, and try to make bending on both sides simultaneous in order to compensate bias load.

(2)Bending plate at full-load (630kN)is not allowed when the length of the plate to be bent is smaller than 630mm(The bending load for the length of every 100 mm cannot exceed 100kN.)

(3)During trial run, note the running direction of the oil pump .

13. Safety Technique and Maintenance

Operators of the machine should get familiar with its main structure, function and way of operation.

They should keep good maintenance and make daily record of working conditions for further reference.

Make proper use of the operating procedure and check computation of the bending pressure tonnage.

Keep the machine from work of single-sided or single-pointed load.

Keep the oil fluid clean and the oil passageway unblocked.

Make constant replenishment of lubricants.

Keep all the electric and hydraulic elements flexible in motion and proper in position.

If anything abnormal appears, stop the machine and trace to its cause. Pay close attention to personal safety.

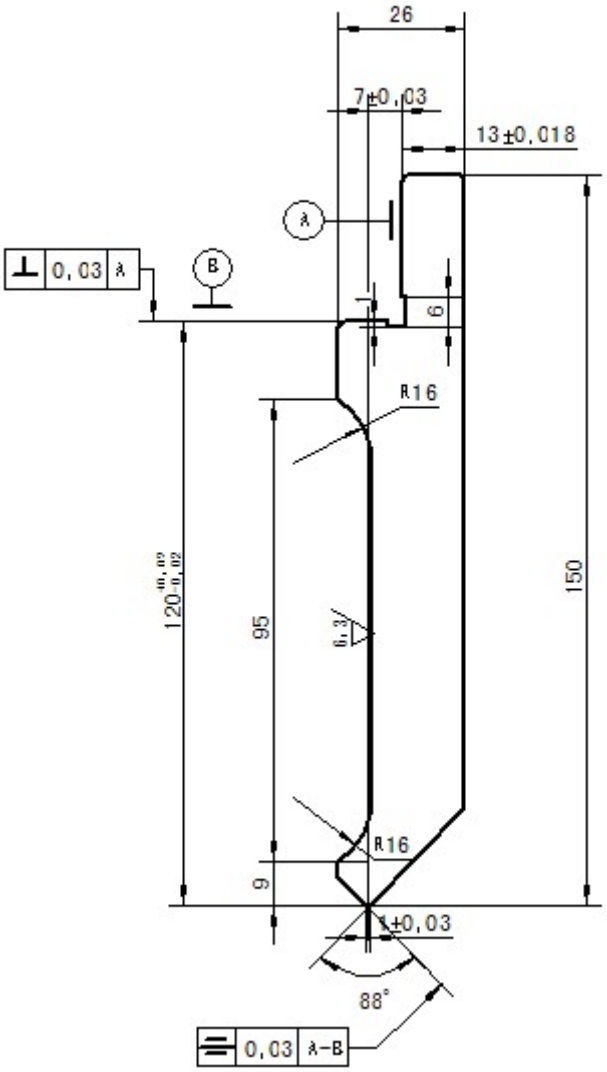
14.List of Basic Accessories Attached to the machine

No.	Name	Norms	Type	Qty.	Remark
1	Foot switch			1 pcs	
2	Anchor bolts	M16*400		4 pcs	
3	Interlocking key for main power switch			2 set	

15. List of Wearing Parts Provided by subscribers

No.	Name	Material	Qty.	Part Attached
1	Lower limiter	70	1	Dam
2	Upper limiter	70	1	Working table
3	Bush	SF-Ⅱ	2	synchronization
4	Bush	SF-Ⅱ	2	Ram. synchronism unit

other 3.2

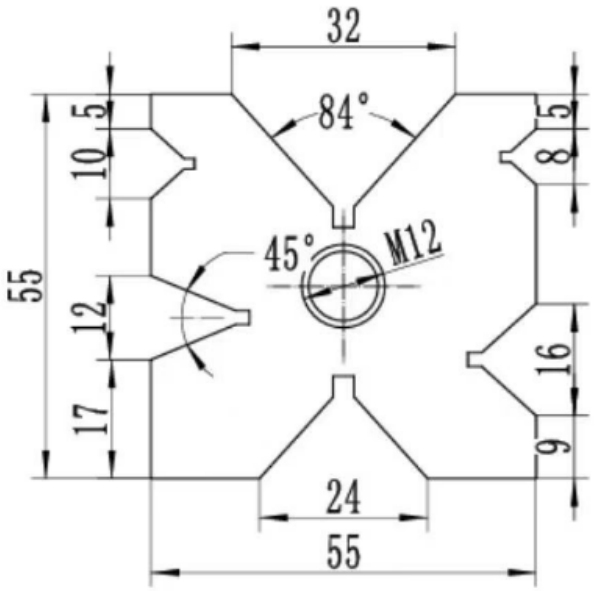


Based on the actual product, it can be customized according to the actual needs of customers. This picture is for reference and not as a basis for delivery.

This mold is a general-purpose mold, and this drawing cannot represent the actual mold. If there is any special customization, please refer to the contract to confirm the mold drawing.

No.	Name	Material	Scale	Remark
24	Upper die	70		

other 3.2



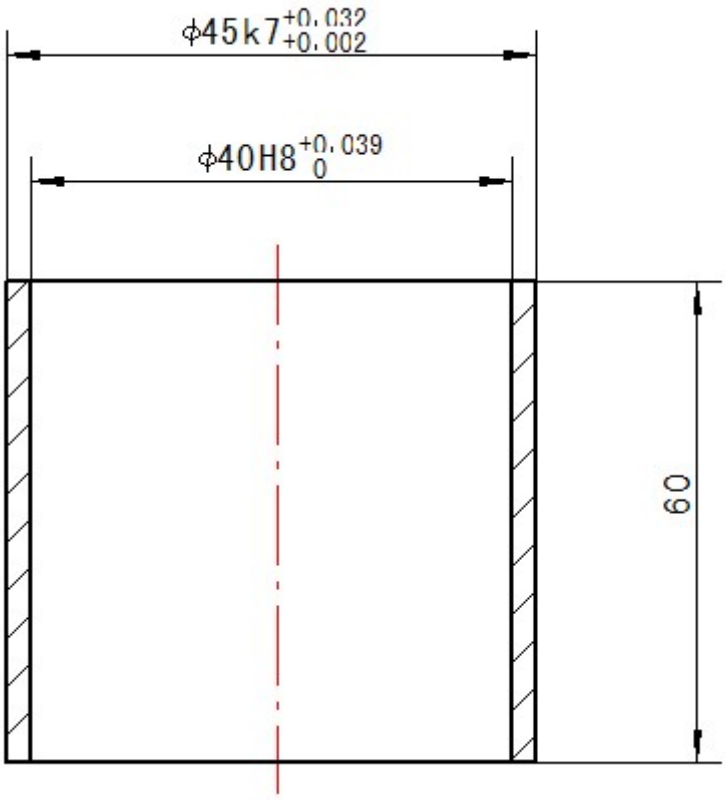
Technical Requirement:

Make V-type groove round R0.9. The full length must be the same.

Based on the actual product, it can be customized according to the actual needs of customers. This picture is for reference and not as a basis for delivery.

This mold is a general-purpose mold, and this drawing cannot represent the actual mold. If there is any special customization, please refer to the contract to confirm the mold drawing.

No.	Name	Material	Scale	Remark
25	Lower Die	70		



No.	Name	Material	Scale	Remark
14 15	Bush	SF2		

WC67Y-40/1600 CNC HYDRAULIC PLATE BENDING MACHINE

CERTIFICATE OF QUALITY

Nominal Pressure: 400 kN

Length of Table: 1600 mm

Delivery No.:

CERTIFICATE OF QUALITY

This is to certify that the quality of this machine is well qualified after inspection and delivery of it is permitted.

Head of the Inspection Depatrment:

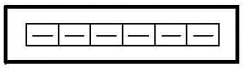
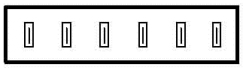
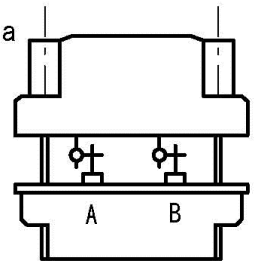
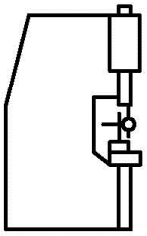
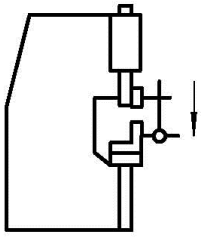
Inspector:

Date:

CERTIFICATE OF QUALITY

Recording list of precision inspection

GB/T14349-93

No.	Inspection item	Schemation drawing	Tool	Tolerance		Measurement
G1	Planeness of worktable	a:  b: 	Level meter	a:		a: b:
				Length of worktable	Tolerance	
				⩽2000	0.06	
				>2000-3200	0.08	
				>3200-4000	0.10	
				>4000-5000	0.12	
				>5000-6300	0.14	
				>6300-8000	0.18	
				b:		
				Width of worktable	tolerance⩽500	
				⩽3200	0.02	
				>3200	0.04	
G2	Parallelism, between worktable and horizontal supporting surface meshed with upper die set	a  b 	Centi-grade scale	a:		a: b:
				Length of worktable	tolerance	
				>1600-2500	0.16	
				>2500-4000	0.18	
				>4000-6300	0.20	
				b:		
				Width of supporting surface	Tolerance	
				⩽50	0.04	
				>50-100	0.10	
G3	Vereleality botween work-table and sliding block's		Centi-grade scale Angle bar	Sliding block's stroke	tolerance	
				⩽100	0.20	
				>100-250	0.25	

CERTIFICATE OF QUALITY

Geometric precision inspection

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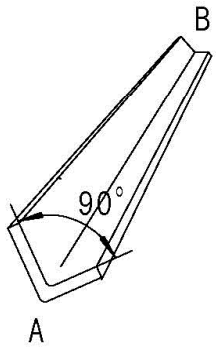
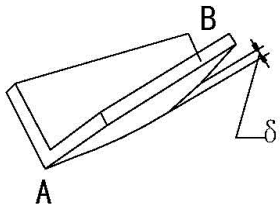
No.	Inspection item	Schemation drawing	Tool	tolerance		Measurement
P1	Bending angle for workpiece		Pant-ometer	Precision class	At whole hength	
				I	±30′	
				II	±1°	
				III	±1° 30′	
P2	Bending straightness of workpiece		Feler Check level-ing rule	Precision class	At the length of 1000	
				I	0,30	
				II	0,75	
				III	1,00	