Contents

WARNING!!

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Ⅰ. Brief Introduction

JH-120 welding line for H-profile steel is a new technical product that integrates mechanical, electric, and pneumatic technologies. The machine, using advanced technology of single-arc double-wire welding, greatly increases the product efficiency. It consists of welding machine, position fixing machine and conveyer.
After fixing the position for the web and two wings of H-profile steel, the welding machine can automatically locatize, clamp, adjust, weld, transport until finishing the all work. The automatic mode of this line greatly lowers the cost of manufacture.

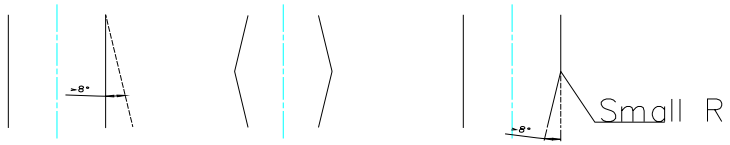
JH-120 welding line is designed by our company which is used to produce H-profile product specially. This line is applied single-arc double –wire welding technology. The welding machine is DC-1000 Lincoln welding machine which is a international famous brand, and the control system for feeding welding wire is NA-5 style Lincoln. All the system is operated by hydraulic oil. The control system is Mitsubishi PLC, which make the line work automatically. The length of H-profile product made by this line is 2-15 meters.

JH120 H-profile welding line is not only easy to be operated, but also it has high automatic and low distortion performance. At the same time, it has reasonable structure, so there is no adjusting trouble when doing different size H-beam product. There is little heat radiancy because of using immersed arc welding, so there is no bad effect to the operator. It has long life and high stability performance, and easy to be maintained and be managed.

Note：

a. The material for H-beam is common mild steel or steel plate which is similar to performance of common mild steel. Web thickness 3～8mm; Web width 300～1200mm; Wing thickness 5～16mm; Wing width 150～500mm. The both edges of steel plate should be wiped off burr or oxidation surface.

b. The position fixed H-beam can't be like following shape（illustrated thick real line is the wing of H-beam ）



Ⅱ.Work flow for welding H-beam

Work flow for welding H-beam has many kinds of style according to different H-beam specification and different technical requirement. Here illustrate one kind of work flow: cut steel plate to be wing plate and web plate, web seam, position fixing welding, automatic welding angle welding line, turn over H-beam , weld another angle welding line of H-beam, rectify wing edge of H-beam.

Work process for welding H-beam automatically:

① Lift steel plate on shearing device (when slit web plate, we suggest using shearing device, and the both edges of steel plate should be wipped off burr or oxidation surface). Use multi-head cutting device or shearing device to slit the steel plate to be different size of wing plate and web plate, and put them in order separately.

② If length of web plate doesn't reach the required length, you should use web seam machine to seam the web so that get the required length of web plate.

③ Lift two wing plate on the conveyer of position fixing machine, operate the position fixing machine to put the web plates on required position, then upright them; then carry the web plate to pointed position through conveyer of position fixing machine, spot weld the head of web plate and wing plates, it is ok.

④ After finishing spot welding H-beam, the spot welded H-Beam will be carried to conveyer of main welding machine, and to be welded automatically.

⑤ After finishing welding one surface H-beam, turn over the H-beam and weld the second surface of H-beam.

⑥ Finishing welding, using rectification device to rectify wing edge of H-beam as requirement or other process until the H-beam shape reach the requirement fully.

Ⅲ. Components of this line

This line consists of following main components：

1 Web seam machine

2 Position fixing station

3 Main welding machine

4 Conveyer

5 Turnover device

6 Main welding machine

Layout of the machine is illustrated in drawing 1.

1. Web seam machine

1)、Brief introduction

This part is to weld the web or wings if the length is not enough. The progress includes: transfer of the web or wings, localize, clamp, adding sloder, weld, solder withdraw, loose of the welded piece and transfer to the next step.

2)、Main parameters

2.1 operation height: about 750mm

2.2 web seam width: 300-1200mm

2.3 web seam height: 3-8mm

2.4 seam welding speed: max. 0.8m/min

3)、Components of web seam welder

3.1 Main frame
3.2 MZ-1000 welder
3.3 Solder withdraw system
3.4 conveyers

4)、Function of web seam machine

Web seam machine is consists of machine parts, pressed parts, copper packing parts, walking parts of wire feeding welder and stock arm, supporting roll, guide roller, roller conveyer, hydraulic system and producing system and so on.

The frame welded by steel plate and rectagular Steel Tube to ensure that it have sufficient strength and rigidity to support the installation of other components.

Pressed parts welded by the angle steel, vertical and horizontal steel bar. Pressed frame rotate flexible, rocker and rocker shaft have enough rigidity which controlled by hydraulic cylinder to do the reciprocating action, push the pressed frame up and down.

The electric conduction part of the copper packing parts have cooling water circulation system, it controlled by hydraulic cylinder to make up and down movement, so that to achieve compressed or loose.

Wire feeding car driven by the motor to do the reciprocating action, it can adjust the gap, wire feeding welder fixed on the walking car to complete welding direction, wire feeding device have spearhead.

When the plates deliver it into the work area, stock arm position the plate then compress, supporting roll make up and down guidance, guide roller make left and right direction position.

Hydraulic systems provide the power for each working parts, and control system is controlled conveyer, pressed frame, side push, oil pump start/stop, hot pad, feeding car, Welding Flux feeding, recovery, welding of each Action.

5) Working flow

Transport one plate to mid-point → compress → Transport second plate to mid-point→ Front pressed foot compress → hot pad cylinder up(counter press) → Open welding flux switch→ start the welding (arc starting, welding, flux recover, etc.)→ stop the welding→ loose the front and rear pressed foot→ output the workpiece

6) Operation explanation

6.1 Before running machine, check the machine, electrical power and hydraulic station for this part to see whether they are in normal work state. The suitable hydraulic oil level is 80% oil tank capacity. The hydraulic oil is #46 anti-friction hydraulic oil;

6.2 Close the welder power and head switch of controller, the indicator is on;

6.3 Turn the key button clockwise, turn on the control electric power, start the oil pump, when the indicator of oil pump is on, then you can do normal operation;

Note:

The max. pressure of hydraulic station for web seam machine is 7 Mpa, flux is 30t/Min. And be careful of following points when running it:

1、When run it first time or reoperate it after long time, you should add oil, make the oil pump full hydraulic oil then run the machine, and run oil pump without loading for five minutes.

2、The oil pump for this part contra rotates. So when running machine, the wind fan of motor should contra rotate;

3、Oil pump does not start, and other operations can not be carried out (Not including the fluorescent light, just closed the head switch, will be able to operate when needed).

6.4 Use crane put the first plate to the conveyer, lay down guide plate on the web seam machine, transport the plate to rear conveyer, let the end of the plate aim the mid-point of hot pad, operate the rear side push button to compress the plate,

and same time operate the rear pressed frame to compress it.

Note: The conveyer initiative on the panel means conveyer clutch operating, the passive means conveyer clutch does not work, Conveyer forward / backward means the conveyer motor is forward / reverse, only turn the corresponding button to initiative and forward / Backward state, the conveyer can work.

6.5 Repeat the fourth step action, and with the first plate was butt state, the middle stay the welding seam according to butt welding technology, clamping up them by side push before operate, use front pressed frame compress, the last compress the hot pad;

6.6 Operate Welding car to the initial location of the welding, press the "welding wire up", "welding wire down" button to regulate the wire arc space, turn button, according to the requirement to adjust "welding voltage", "welding current," " welding speed" , push the " ammeter polar " to "plus", push the "welding car running" to "welding" side, " voltage direction" to "welding" side;

Note: The "welding car / welding" under the "voltage direction" means that the toggle switch turn to which side, the voltage table shows the voltage is welding voltage or welding car voltage.

The “plus-minus" under the “Ammeter polar" refers to the button turn to which side. Wire Polarity is this polarity, the ordinary polarity of the wire is plus.

The “Installing/welding" under the “Welding car running" refers to in the "installing" state can process the installing work, welding car can be manually forward / backward, under "welding" state that the car can not be manually forward / backward, However, need to play a certain direction.

6.7 Turn the "Welding running" to "welding" state, turn the car to forward state, open the flux recovery system, manually send the Flux, press the "start welding" button, be able to carry out welding work, press "stop welding "Button 3 seconds, then stop welding work;

Note:

1. Through three phase (150A) automatic switch supply the power to the

machine, the cross-sectional area of input cable line is not less than 25mm^2 plastic copper lines, connection must be secure fastening.

2. For security purposes, the shell of machine must take a good grounding line, power lines use effective section 10 mm^2 plastic copper lines.

3. Welding Machine operation: Welding current for near control operation, turn the near control switch to “near control” position, start the button to start power supply, the power indicator light, turn the machine switch to "on" position, Cooling fan operation, machine have voltage output is ready to work, choose and adjust welding current scale, according to the request to adjust the determinate push current. Welder output current for long-distance control, turn the choose switch to "far-controlled" position, plug into the far control box can be well far controlled current, the other adjustment are same.

4. Push current and arc current use instruction: Push current is on the low side when using welding norms, as the roots of welding seam, all-position welding, they can adjust the push current to increase in certain short-circuit current, so that the welding rod not easy to stick. The normal standard of welding current can not add push current. Also pay attention that when welding need add the push current is appropriate, excessive force, the current will increase arc splash.

Striking Current is play each arc, a given voltage increase in a short period of time, so that the current big, easy-to-play-arc. Additional add arc heat, in favor of the weld joint penetration.

6.8 If there is emergency, press the button of “emergency”, all operation will be stopped.

2. Position Fixing Station

1)、Brief introduction

The position fixing station is used to transport the steel plate according to requirement and position fixed them to be H profile, And it can adjust the position of web and wings slightly keeping the H-profile unchanged. The all operation steps are finished

through control panel.

2)、Main parameters

2.1 operation height: about 750mm

2.2 dimension of conveyer: about 2000×15000mm

2.3 dimension of main frame: about 1000 ×3500mm

2.4 hydraulic motor power: about 5.5KW

2.5 Total power: about 7KW

3) components of this station

3.1. Main machine frame

3.2. Conveyers for this part

3.3. Hydraulic station

3.4. Electrical controller

4) Function of position fixing machine

Work process of position fixing machine consists of three parts: preparation process, adjustment process and spot welding. The corresponding three parts to the above processes are: conveyer of position fixing machine, position fixing machine and electrical power for welding (this part is supplied by user). The conveyer not only has function of carrying web plate and wing plate, but also has function of up righting the wing plates.

The function of position fixing machine is to make the two wing plates and web plate to be H shape, and make there is room to adjust the two wing plates and web plate, so that doing spot weld. The length of position fixing machine is 1m, width of it is 3.5m. The electric power for welding is common AC arc welding device. There are hydraulic station and electric cabinet for position fixing machine.

5) Working flow

Put the wing panel on the conveyor ⟶ oil vat for turning the wing panel work ⟶ upright the two wing ⟶ oil vat for turning wing panel reposition ⟶ oil vat for lifting work ⟶ wing panel lifting ⟶ put the web panel on the conveyor ⟶ oil vat for lifting descend ⟶ web panel and two wing panels on the conveyor ⟶ adjust them as requirement ⟶ spot weld the head of three panel and let them to be H-profile

6) Operation explanation

6.1 Before running machine, check the position fixing machine and hydraulic station for this part to see whether they are in normal work state. The suitable hydraulic oil level is 80% oil tank capacity. The hydraulic oil is #46 anti-friction hydraulic oil;

6.2 Close the head switch of controller, the indicator is on;

6.3 Turn the key button clockwise, turn on the control electric power, start the oil pump, when the indicator of oil pump is on, then you can do normal operation;

Note:

The max. pressure of hydraulic station for position fixing machine is 7 Mpa, flux is 47.5t/Min. And be careful of following points when running it:

1、When run it first time or reoperate it after long time,you should add oil, make the oil pump full hydraulic oil then run the machine, and run oil pump without loading for five minutes.

2、The oil pump for this part contra rotates. So when running machine, the wind fan of motor should contra rotate;

3、When running machine first time, maybe the oil in tank isn't enough, you should add oil in time in case the hydraulic oil is absorbed completely by oil pump;

4、Replace the hydraulic oil in oil tank every half a year, and clean the oil tank inner wall when replace oil, clean or replace the oil filter;

5、When spot welding, you should spot weld quickly, increase the time of pump discharge loading farthest to prevent the hydraulic system too hot;

6、 When finish work, should discharge the oil pump so that the system can emit heat in time;

7、 The jog button is used only when the oil pump start just or the pump can't absorb oil. When start machine, the indicator for discharge loading is on, you can operate the machine when the indicator is on for five seconds. When operate machine, the indicator is off, and it will be on when finishing operation in 5 seconds.

6.4 Lift the two wing plates on the both sides of conveyer separately, operate the conveyer to carry the plates to the position of driving roller of position fixing machine, hit the button of "upright wing", upright the two wings then they will be aborbed by magnet the side frame. Hit the button of "asway arm going ahead" to clamp the wing plates, hit the button of "wing plate turn down" to make the oil vat for turning wing panel reposition. Reoperate the button of "uplift wing" to uplift the wings so that there is no friction between wings and conveyer.

6.5 Lift the web plate on the conveyer of position fixing machine, operate the

rollers to make the web plate and wing plates be in same level, hit the button of "web plate lifting", to adjust the level to be required level.

Note:

"Rollers initiative"on operation desk means clutch for rollers absorb, "Rollers passivity"means cultch for rollers no running. "rollers go ahead/go back" means the motor for rollers forward /reverse. Only you hit the button "Rollers initiative"the rollers can be operated going ahead or going back.

6.6 Turn the button of "wing retract", put down the uplifted wings, and then press the button of " clamping rollers go ahead" to clamp the workpiece, this time the H-beam is being formed roughly. Operate the rollers on conveyer to make the H-beam workpiece go ahead, and make the web plate into the clamping device, clamp the web plate;

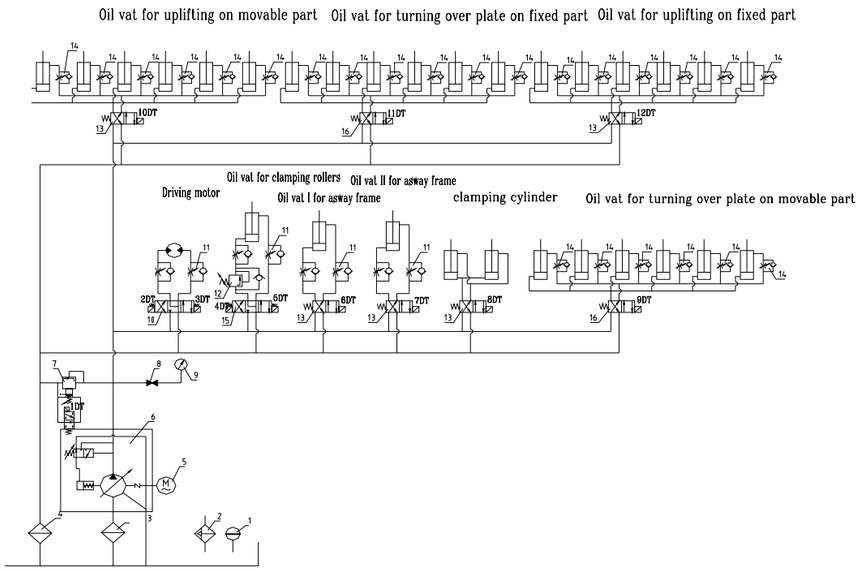
6.7 Turn the screw, adjust the height of web plate to wing plates slightly, spot weld the wings and web two points on the position of 10cm to head of H-beam, it is ok when the wings and web won't be fall to pieces. After finishing spot welding, loosen the clamping device, back off the asway arm, loosen the clamping rollers, carry the spot welded H-bam to main welding machine.

6.8 If there is emergency, press the button of "emergency", all operation will be stopped.

7) Hydraulic system of position fixing machine

Note:

The max. pressure of hydraulic station for position fixing machine is 7.5Mpa, flux is 47.5t/Min. Its work principle is illustrated in following drawing 5.



Action \ Magnet	1DT	2DT	3DT	4DT	5DT	6DT	7DT	8DT	9DT	10DT	11DT	12DT
Driving motor — Forward	+		+									
Driving motor — Retain												
Driving motor — Reverse	+	+										
Oil vat for clamping rollers — Go ahead	+				+							
Oil vat for clamping rollers — Retain												
Oil vat for clamping rollers — Go back	+			+								
Oil val I for asway frame — Go ahead	+					+						
Oil val I for asway frame — Go back												
Oil val II for asway frame — Go ahead	+						+					
Oil val II for asway frame — Go back												
Oil vat for clamping — Clamp	+							+				
Oil vat for clamping — Loosen												
Oil vat for turning over plate on movable part — Upright	+								+			
Oil vat for turning over plate on movable part — lay down												
Oil vat for uplifting on movable part — Uplift	+									+		
Oil vat for uplifting on movable part — Retract												
Oil vat for turning over plate on fixed part — Upright	+										+	
Oil vat for turning over plate on fixed part — Lay down												
Oil vat for uplifting on fixed part — Uplift	+											+
Oil vat for uplifting on fixed part — Retract												
Discharge loading												

No.	Name	Specification	Qty.	Remark
10	2-phase 4-way valve	4WE10Y-30/AW220-50NZ4	2	
15	3-phase 4-way valve	4WE10J-30/AW220-50NZ4	1	
14	Single-way throttle valve	MK6G12/2	24	
13	2-phase 4-way valve	4WE6Y-60/AW220-50NZ4	5	
12	Decompress valve	ZDR10DA2-40/7.5Y	1	
11	Single-way throttle valve	Z2FS6-30	4	
10	3-phase 4-way valve	4WE6J-60/AW220-50NZ4	1	
9	Pressure gauge	YN60-1/10	1	
8	Pressure gauge switch	KF-L8/14E	1	
7	Overflow valve	DBW10B-1-30/10UW220-50NZ4	1	
6	Variable pump	PVBQA15-LS-32-C-11-PRC	1	
5	Motor	Y132M-4(B35)	1	P=7.5KW,n=1440rpm
4	Filter for returning oil	PZU-160*20	1	
3	Filter for absorbing oil	Wu-160*80-J	1	
2	Air filter	QUQ -ED*0.63	1	
1	Thermometer	CYW-125	1	

Work principle of hydraulic system for position fixing machine

Drawing 5

7.1 Adjustment of hydraulic system

7.1.1 Adjustment of pump

a. When run it first time or reoperate it after long time, you should add oil, make the oil pump full hydraulic oil then run the machine, and run oil pump without loading for five minutes then do other operation. Here the pump contrarotates, and the fan of motor rotates clockwise.

b. Adjust the pressure of Pump 6 to be 7.5Mpa, adjust the pressure of security valve(that is overflow valve) to be 9.5Mpa.

7.1.2 Adjustment of driving motor

Adjsut the rotate speed to be 80rpm.7.1.3 Adjustment of oil vat for clamping rollers

Adjust the pressure of decompress valve to be 3mpa, speed of oil vat to be 100mm/s.

7.1.4 Adjustment of oil vat for away frame

Speed of oil vat to be 100mm/s, make the two oil vats to be in-phase.

7.1.5 Adjustment of oil vat for turning plate

Speed of oil vat to be 50mm/s, make each group vats to be in-phase.

7.1.6 Adjustment of oil vat for uplifting

Speed of oil vat to be 20mm/s, make each group vats to be in-phase.

7.2 Notes

a. The suitable hydraulic oil level is 80% oil tank capacity. The hydraulic oil is N46 anti-friction hydraulic oil;

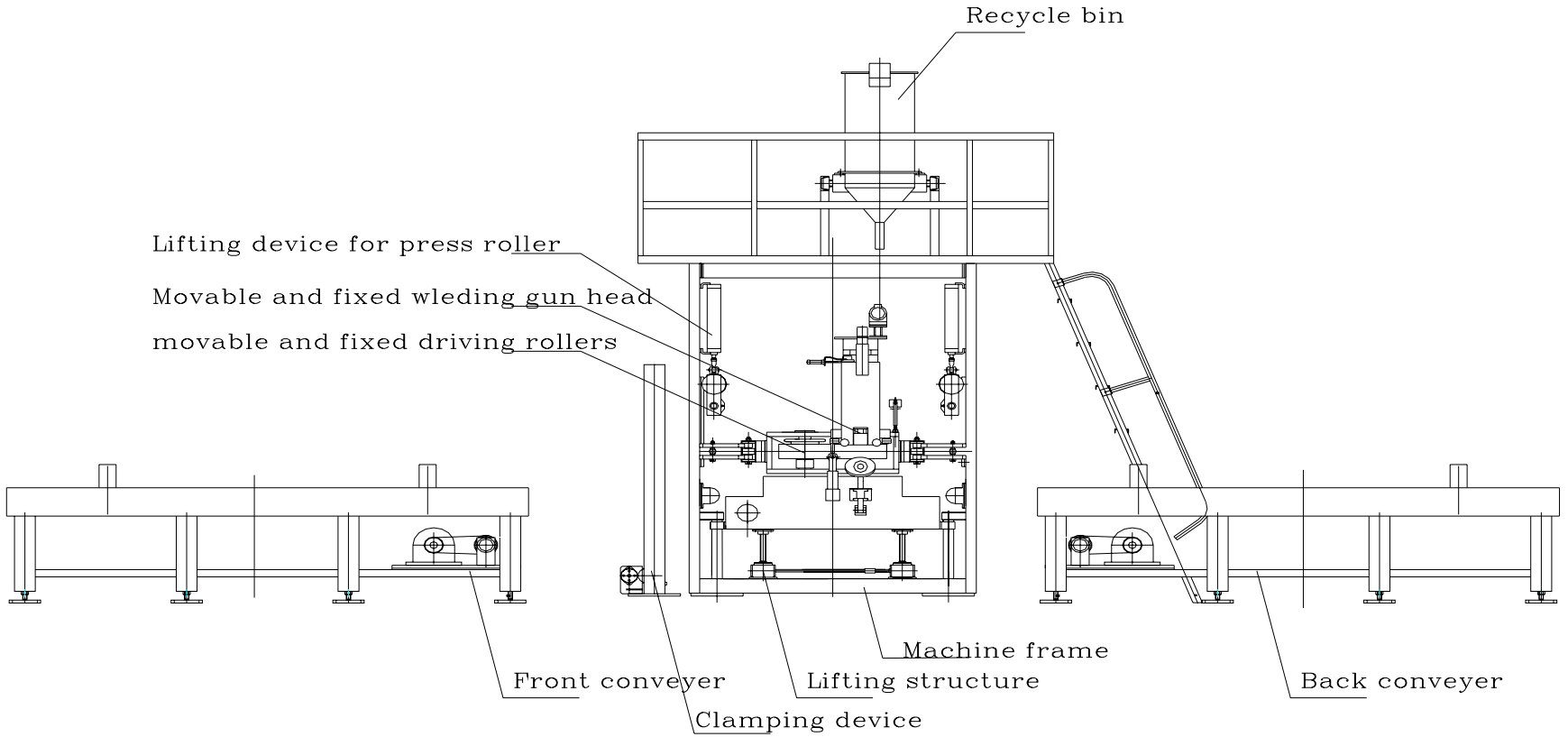
b. When running machine first time or finishing testing work before operation, maybe the oil in tank isn't enough, you should add oil in time in case that hydraulic oil is absorbed completely by oil pump;

c. Replace the hydraulic oil in oil tank every half a year, and clean the oil tank inner wall when replace oil, clean or replace the oil filter;

3 Main welding machine

1) **Brief introduction**

Main welder is America Lincoln welding machine; adopt welding technology of single-side double-wire arc welding. It has high automatic and easy to be operated performance. And welding even performance.



Drawing of Main welding machine

Main parameters

working height: about 750mm

weight of this part：about 6000kg

welding speed: max. 2m/min

conveyer size：about 1700×15000mm

Conveyer speed： max.8m/min

H-profile specifications

Main welding speed: 500-2000mm/min

Web thickness 3～8mm

Web width 300～1200mm

Web length 2～15m

Wing thickness 5～16mm

Wing width 150～500mm

Wing length 2～15m

Inclination of H-profile steel : ≤8º(unilateral)

conveyor motor power:2.2KW

hydraulic motor power 18.5KW

solder withdraw motor power:2.2KW×2

Total capacity: 22.5KW+90kVA×2

3) Components of main welding machine

3.1 Conveyor

3.2 Clamping equipment

3.3 Main machine

3.4 Welder 1 set

3.5 Solder withdraw equipment 1 set

3.6 hydraulic system

3.7 electrical controller

3.3.3.1 Main welder frame

Welder frame is welded with steel plate so it owns high strength and hardness to bear the weight of other components that are installed on it.

3.3.3.2 lifting system

Please refer to drawing of layout of whole line. The lifting equipment adopts worm wheel worm rod reducer and rod to lift or descend the height of welder platform,so as to suit different height of the web in H-beam welding.

3.3.3.3 Welding gun and driving roller

The fixed welding gun and the unfixed welding gun are composed of working platform, welding nozzle and driving roller. The unfixed welding gun can move transversely and can rotate, it moves flexible by the push of two oil vat for away frame, meanwhile, it rotates by the different moving distance of two oil vat.The driving roller is driven by hydraulic motor which is installed on the slipway, and the speed is adjustable. The two oil vat for asway frame is also can be adjusted to suit for the welding of taper-beam.Apart from the above features, the unfixed welding gun can be adjusted up and down slightly to ensure that the welding wire will be feeded with a correct angle and position.

3.3.3.4 Lifting equipment for clamping roller

This equipment is used to fix the position of wing plate when in the welding of H-beam, it’s composed of pneumatic cylinder and gear wheel roller.

3.3.3.5 Solder withdraw system

The main function of solder withdraw system is to lay solder on the welding line before welding and withdraw the unused solder after welding. This system owns a storage for spare solder. There are two withdraw equipments and one is for fixed welding gun,the other is for unfixed welding gun which can be moved as the moving of unfixed welding gun.

3.3.3.6 Clamping equipment

Clamping equipment is installed between front conveyor of main welder and main welder. It is used to adjust the height of the web plate and help to firm the

wing plate when in welding. The height of this equipment is adjusted by worm wheel worm rod and rod which are driven by hydraulic motor.

3.3.3.7 Conveyor

The conveyor consists of front conveyor and back conveyor, both of them is to transfer actively. The motor is connected with the magnetic clutch. When the driving roller start to work, the front and the back conveyor change into transferring passively, at the same time, the position fixing equipment that installed on the conveyor will help to adjust the position of H-beam plates. Besides the function to support H-beam plates, the welder conveyor also can transfer H-beam or H-beam plates when the driving roller is not at work.

3.3.4 Function and structure

The main welder is the key machine to finish welding on the basis of position fixed. It consists of supporting and clamping equipment、welder frame、lifting system、welding gun、driven equipment、impacting roller、front and back conveyor、solder withdraw system、welding equipment、controller、hydraulic and pneumatic system.

The form of clamping equipment can be changed according to different dimension of H-beam, so as to keep availability for transferring H-beam plates with different dimension.

Welder frame is welded with steel plate so it owns high strength and hardness to bear the weight of other components that are installed on it.

The lifting equipment is a mechanical adjusting system which is special designed to suit for different height of the wing plate, it adopts worm wheel worm rod reducer and motor to adjust height to satisfy the different height of the wing plate in H-beam welding.

The fixed welding gun and the unfixed welding gun are composed of working platform, welding nozzle and driving roller. The unfixed welding gun can move transversely and can rotate, it moves flexible by the push of two oil vat for away

frame, meanwhile, it rotates by the different moving distance of two oil vat. The driving roller is driven by hydraulic motor which is installed on the slipway, and the speed is adjustable. The two oil vat for away frame is also can be adjusted to suit for the welding of taper-beam. Apart from the above features, the unfixed welding gun can be adjusted up and down slightly to ensure that the welding wire will be feeded with a correct angle and position. The material of welder gun is alloy of chromium、zirconium and cuprum to satisfy the high temperature in welding. The lifting equipment for clamping roller is used to fix the position of wing plate when in the welding of H-beam, it's composed of pneumatic cylinder、gear wheel and impacting roller. Because the steel plate for H-beam are always cut by acetylene, it's often to engender hard and rough oxide at the both edges of those plates, which will cause damage to the roller. In order to overcome this deficiency, we adopt bearing steel with quench treatment to improve the roller's hardness which will be undamaged at the infection of oxide.

The front and back conveyor is used for transfer ring, which transfer three un-welded plates to welder and move the H-beam away from the welder. Solder withdraw system provide enough solder and absorb the unused solder.

Welding system is mainly composed of welding power and wire giving equipment and another related control equipment. The controller、hydraulic and pneumatic system are not the dependent parts ,but the accessorial parts to harmonize the operation of welder automatically.

3.3.5 **Work flow**

The spot welding H-profile into the clamping equipment → into the main weilder → adjust the web height → the side roller of main machine impact → adjust the welding gun → turn on the switch for feeding welding agent → begin to weld → turn on the switch for withdrawing welding agent → turn off the switch for feeding welding agent → finish welding → turn off the switch for withdrawing welding agent

4、Turnover device

(1)、Introduction

Turnover device and conveyor is mainly to fling around and transport the already one side welded H beams, then to do the welding on the next side. The action of turnover is mainly to be done by the electric motorized calabash, the roller conveyor is to be transmitted by the conveyor, both of them has separate control button on the panel.

(2)、Technical parameters of turnover device

frame roller width：3350mm

frame roller length：15000mm

working height： about 750mm

Conveyor running speed：max 8m/min

machine power：8KW

H beam specification： length 2-15m

width 300-1200mm

height 150-500mm

overall dimension：5040×4250×4200mm

max turnover workpiece capacity：4000kg

(3)、composition

1)、turnover device

2)、turnover roller

3)、control box

(4)、Function

turnover device mainly consists of roller conveyor,turover frame and H beam side positioning device.

The left conveyor is to connect the H beam which has already been welded on the front main welder, and the right conveyor is to take the H beam after turning over 180ºdegree，and to be transmitted to the back welder to do the other side welding of the H beams.

Turnover device is separately consisted of frame, four electric motorized calabash and four advancing motors。The function of the four motorized calabashs is to hang up the H beams, among which two of them will descend, the other two will rise to turn the H beam over. And the advancing motor is to move the already turned H beam of the right conveyor to the left conveyor.

The side positioning device of H beams is composed of two oil cylinders and hinge. when the electric motorized calabashs release the H beam on the right conveyor，H beam position is random, then to push the beam to the side positioning roller with the side positioning device to prepare for the back main welder.

(5)、Work flow

Front main welder welding → left roller transmitting workpiece to the downside of the turnover frame → four motorized calabashs to the turnover height → two motorized calabashs descend → two motorized calabashs descend → workpiece turnover

Advancing motor to transmit the workpiece to the right conveyor → motorized calabashs descend → side pushing device push → right conveyor transmitting workpiece to the back main welder

(6)、operation instruction

1)、check the mechanic, electric and hydraulic system if it is Ok

2)、close the overall switch and the indication light is on

3)、turn the key switch clockwise and turn on the control power to enter normal operation.

4)、operation traveling motor group to make it advance on the upper left side of the conveyor，and to lower the chain to the down side of the conveyor, for passing H beams；

attention：operate traveling motor，it should be avoided that the front and back groups of traveling motor touch. And on the same moving direction, the first group of traveling motor shall automatically stop when touching the limit, but the back group doesn’t have such a function, so it should be controlled personally. And under the connect moving conditions, when travelling to the end

of the turnover frame, the four traveling motor shall stop automatically.

5)、operate on the roller，to transmit the single side welded H beam to the place of the turnover device and to make the center of H beam and the transmission frame same place.

6)、lift the motorized calabashs to certain height，and to make H beams turn 180ºand lower to certain height， turn the connection switch which automatically enable the H beam to move from one side to another and automatically stop，then side push the H beam to move along the conveyor column and near it，afterwards to release the beam and remove the side push and transmit it to the next process, thus completing the whole turnover process.

Attention： when operating calabashs，it should avoided the imbalance of the H beam, thus it can be balanced through adjusting on the " calabashs adjustment". During the operation process, the calabashs should be checked regularly and replace in case in time, to keep it in a good condition.

8)、If there's emergency, press "urgent stop" button to stop everything.

3.3.6 Operation instruction

3.3.6.1 Before operating the machine, you should do some inspection.

3.3.6.2 Close the head switch of controller and the power of welder, the indicator is on.

3.3.6.3 Turn on the power switch at the side of controller, turn the key button clockwise, turn on the control electric power, start the oil pump, when the indicator of oil pump is on, then you can do normal operation.

Note:

It take 15 second to start the oil pump. The max. pressure of this hydraulic station is 15 Mpa, flux is 62L/Min. And be careful of following points when running it:

a. When run it first time or reoperate it after long time, you should add oil, make the oil pump is full of hydraulic oil then run the machine, and run oil pump without loading for five minutes.
b. The oil pump for this part contra rotates. So when running machine, the wind fan of motor should contra rotate; as to the cooler is absorb wind or blow wind should be ensured by debugging worker.

c. Before running machine, check the oil tank. The suitable hydraulic oil level is 80% oil tank capacity. The hydraulic oil is N46 anti-friction hydraulic oil; in the winter of cold district, it's better to use the oil which stickiness is a little lower.
d. When running machine first time, maybe the oil in tank isn't enough, you should add oil in time in case the hydraulic oil is absorbed completely by oil pump;
e. Replace the hydraulic oil in oil tank every half a year, and clean the oil tank inner wall when replace oil, clean or replace the core of oil filter;
f. When finish work, should discharge the oil pump so that the system can emit heat in time;

Pay attention as followings when using pneumatic equipment.

a. The pressure of air supplier is not less than 0.7Mpa;
b. Adjust the pressure of decompress valve of three-connection unit to be 0.6Mpa,and the pressure of mini- decompress valve on electric iron is to be 0.3 Mpa.
c. It is commended to use L-FC32 lube for sprayer, and check it frequently. when the oil is used up, add it in time to avoid causing breakdown.
d. After closing the head switch of controller, daylight lamp can work on at the any moment according your requirement.
e. When running machine first time, you should operate the button "welder frame descend"on the controller panel to descend the frame to a appropriate position, and adjust the height of welder frame when H-beam reach, but if not change the dimension of H-beam,these process is unnecessary.
f. Operate the slipway to advance/reverse and leave enough width room for the H-beam, then operate the front conveyor to advance, transfer H-beam which head position has been fixed to slipway of welding machine;
g. Adjust the height of web plate by adjusting the accessorial supporter and welder frame, then press the button"slipway forward",impact the H-beam unit;

Note:

The button"Slipway forward"is a kind of alternate button. That is when first

press, the platform keep advancing and the indicator is on, then press it again, the platform stop. When the indicator for the button“Slipway forward” is on, don’t press the button“Slipway backward”,otherwise, the machine will be break down.

h. Operate the machine to make the H-beam unit jog or reverse, adjust the speed for welding by adjusting the potentiometer.

Note:

When the driving roller start to work, the speed shown on velocimeter will be a little sluggish. If the last figure of speed is jumping in a few second, it’s normal. But if it changes in a larger scale, it’s necessary to check driving roller and settle the hydraulic problem.

i. Press the button“Welding gun forward”, so that two welding gun press H-beam tightly and also press the front electric iron tightly;

1、 Impact: 7YV（11YV）gets electricity,hydraulic cylinder for transverse moving is on working till 2YJ（4YJ） sends signal, 7YV（11YV）lose electricity, 5YV（9YV）gets electricity,upright hydraulic cylinder is on working till 1YJ（3YJ）sends signal, 5YV，7YV，（9YV，11YV） all get electricity, two hydraulic cylinders press tightly.

2、 loose: 4YV，6YV（8YV，10YV）get electricity, the two hydraulic cylinders loosen. If the input indicator X42、X43、X44、X45 is not on, there must be something wrong with the relevant relay, you must do some repairs or replace them in time.when the welder is not on operating and the conveyor、welder frame lifting and descend system can not work, check the X42，X43，X44，X45 in PLC system, if there are indicators on, that is to say the pressure switch is sending wrong signal, adjust the pressure switch till the indicator is off.

j. Adjust the position of welding nozzle by pressing the button “welding nozzle adjustment upper/lower” . Adjust the length of welding wire by manual(generally,3-5mm length is appropriate, if the wire have some defect, shear the defective part)；adjust the welding electricity and voltage.

Note:

After finish the adjustment, shear two heads of welding wire to be identical place and adjust two welding wire to form a angle(the front wire is a little higher and the angle shouldn't too big.). It is helpful for welding.

k. Start the solder giving and withdrawing system, press the button"start" for normally welding.

l. When H-beam press lower roller of back clamping roller, descend the upper roller and back iron conductor; note: when the iron conductor is getting tightly, the H-beam must be advanced.

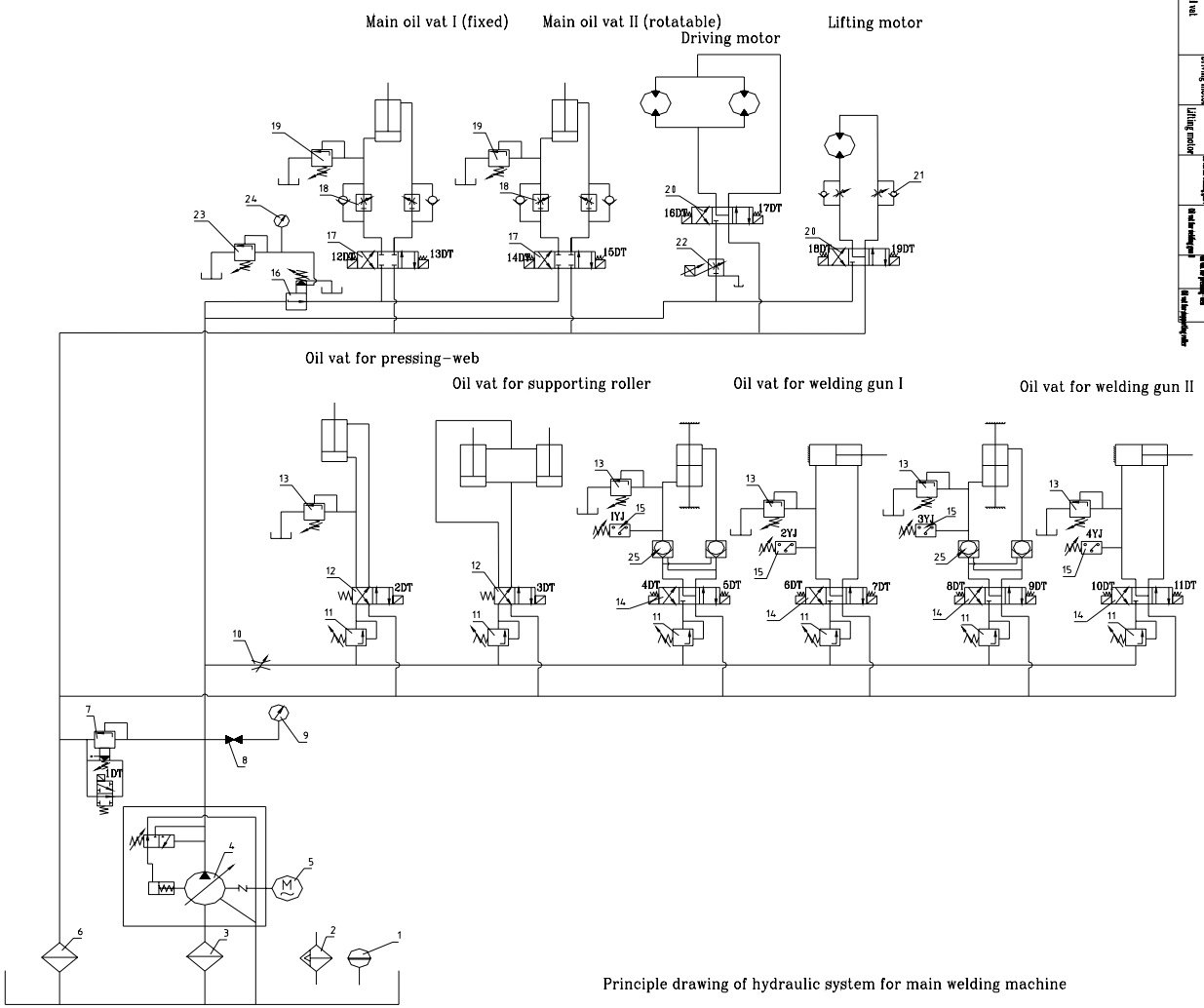
m. When the end of H-beam is can't be detected by light-control detector,the front clamping roller and front iron conductor will be loosen automatically.

n. Stop the operation of solder withdraw system before welding is finished.

o. When reach to the end of H-beam in welding, stop it and absorb the solder clearly, loose the front / back pressing roller and front/back iron conductor, operate the unfixed welding gun platform to reverse, then transfer the H-beam by back conveyor.

3.3.7 Hydraulic system

Consulting drawing 3 for the principle of welder hydraulic station,the max.pressure is 15 Mpa, the max.flux is 62L/Min.



Principle drawing of hydraulic system for main welding machine

Action		1DT	2DT	3DT	4DT	5DT	6DT	7DT	8DT	9DT	10DT	11DT	12DT	13DT	14DT	15DT	16DT	17DT	18DT	19DT	1YJ	2YJ	3YJ	4YJ
Main oil vat.	forward	+												+		+								
	backward	+											+		+									
	retain																							
	rotate left	+													+									
	rotate right	+														+								
Driving motor	forward	+															+							
	retain																							
	reverse	+																+						
Lifting motor	forward	+																	+					
	retain																							
	reverse	+																		+				
Master valve of oil vat for pressing-web	impact	+				+		+													/	/		
	retain																							
	loose				+		+														\	\	/	/
Master valve of oil vat for supporting roller	impact	+								+		+											/	/
	retain																							
	loose								+		+												\	\
Master valve of oil vat for welding gun I	impact	+	+																					
	loose																							
Master valve of oil vat for welding gun II	impact	+		+																				
	loose																							

No.	Name	Spec.	Qty.
25	Single-way valve	Z2S6-40	2
24	Pressure gauge	YN-60/10-M	1
23	Additive valve	DBDH6G10/10/2	1
22	Adjusting-speed valve	EFG-03-60-26	1
21	Throttle	Z2FS10-20	1
20	3-way 4-phase valve	4WE10J-30/AW220-50NZ4	2
19	Additive valve	ZDB10VA2-30/10	2
18	Adjusting-speed valve	MPW-03-X-11	2
17	3-way 4-phase valve	4WE10E-30/AW220-50NZ4	2
16	Decompression valve	DR10-4-30/10YM	1
15	Pressure relay	HED4OH10/5Z14L220	4 ■▶■■308401
14	3-way 4-phase valve	4WE6J-60/AW220-50NZ4	4
13	Additive valve	ZDB6VA2-30/10	6
12	2-way 4-phase valve	4WE6Y-60/AW220-50NZ4	2
11	Decompression valve	ZDR6DP2-30/2.5YM	6
10	Throttle	MG6G12/2	1
9	Pressure gauge	YN-60/25-1	1
8	Switch of pressure gauge	KF-L8/14E	1
7	Additive valve	DBW10B-2-30/31.5UW220-50NZ4	1
6	Oil filter	PZU-250*5	1
5	Motor	Y180M-4(B35)	1
4	Pressure pump	PVBQA20-LS-22-C-11-PRC	1
3	Oil filter	Wu-250*80-J	1
2	Air filter	QUQ -1020.63	1
1	Thermometer	YWZ-125T	1

a. Adjustment of hydraulic system

1. Adjustment of oil pump

1. 1 When run it first time or reoperate it after long time,you should add oil, make the oil pump full hydraulic oil then run the machine, and run oil pump without loading for five minutes then do other operation. Here the pump contrarotates, and the fan of motor rotates clockwise.jhuy7

2. Adjustment of the main oil vat

2.1 Adjustment of decompress valve-overflow valve

Adjustment the pressure of decompress valve16 to 4Mpa and the overflow valve 19 is to be 4.5Mpa,

2.2 Adjust two oil vats to be in-phase

Take the piston rod of two main oil vats down and adjust the speed valve to make sure that the forward speed and the backward speed of hydraulic cylinder are 2m/Min, then connect the piston rod to slip platform. If they are still not in-phase, do some fine adjustment till in the same phase.

3. Adjustment of driving motor

Loose the bolt on timing valve magnet firstly to let the inner air out. Adjust the electricity location-gauge on controller panel to control the speed of two driving motor.

4. Adjust the motor for lifting and descending

Adjust throttle21 to make the moving speed to be appropriate.

5. Adjust the oil vat for pressing web plate、oil vat for supporting wheel、oil vat for welding gun.

5.1 Adjustment of decompress valve- overflow valve

Adjust the pressure of decompress valve to be 2mpa,and the overflow valve13 to be 2.5Mpa.

5.2 Adjustment of pressure relay.

Adjust the pressure of pressure relay to 1.8Mpa,and the resuming pressure shouldn’t less than 1.4Mpa.

5.3 Adjustment of thottle10

Adjust thottle10 to make time for impacting of welding gun oil vat to be about 3 seconds and time for reversing to be about 3 seconds.

Attentions:

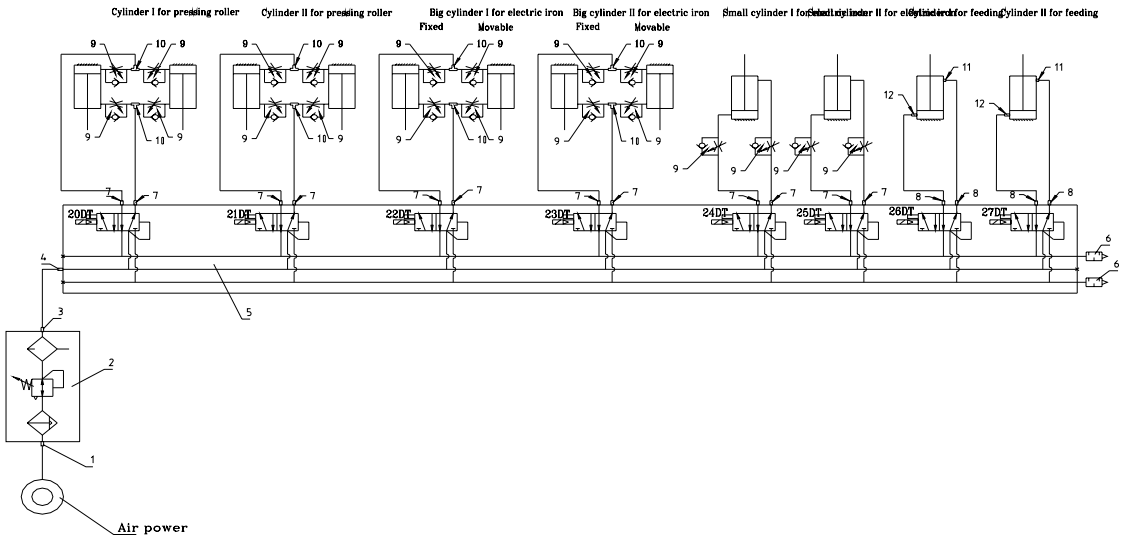
1. The suitable hydraulic oil level is 80% oil tank capacity. The hydraulic oil is N46 anti-friction hydraulic oil;
2. When running machine first time or finishing testing work before operation, maybe the oil in tank isn't enough, you should add oil in time in case that hydraulic oil is absorbed completely by oil pump
3. Replace the hydraulic oil in oil tank every half a year, and clean the oil tank inner wall when replace oil, clean or replace the oil filter;
4. Each time to change the oil, uninstall the adjusting-speed valve and install the clearing unit, after finishing cleaning, uninstall clearing unit and install the adjusting-speed, clean the filter .

3.3.8 Pneumatic system

Consulting drawing 4 for the principle of pneumatic system, be careful of following points:

a. Adjust the pressure of decompress valve in three-connection unit to 0.5Mpa. Adjust the throttle which is fixed on pneumatic cylinder to make a appropriate speed for each component. Pneumatic cylinder should be pre-adjusted to make two cylinders in-phase, otherwise, it is easy to cause trembling for clamping roller.

It is commended to use L-FC32 lube for sprayer, and check it frequently. when the oil is used up, add it in time to avoid causing breakdown.



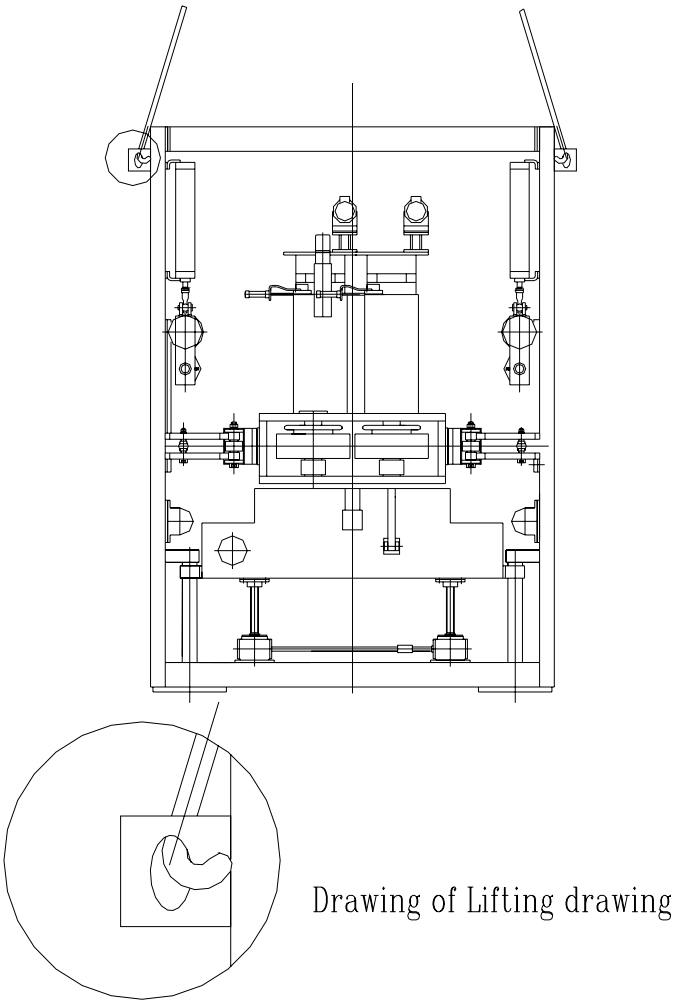
Drawing of air control principle for main welding machine

Action		Magnetic iron 20DT	21DT	22DT	23DT	24DT	25DT	26DT	27DT
Cylinder I for pressing roller	Impact	+							
	Loose								
Cylinder II for pressing roller	Impact		+						
	Loose								
Big cylinder I for electric iron	Impact			+					
	Loose								
Big cylinder II for electric iron	Impact				+				
	Loose								
Small cylinder I for electric iron	Impact					+			
	Loose								
Small cylinder II for electric iron	Impact						+		
	Loose								
Cylinder I for feeding	Open							+	
	Close								
Cylinder II for feeding	Open								+
	Close								

No.	Name	Spec.	Qty.	
12	3175 through joint	31750610	2	浙江新益
11	3209 through joint	32090610	2	浙江新益
10	3104 3-way joint	31040800	8	浙江新益
9	7710 throttle	77100817	20	浙江新益
8	3209 through joint	32090613	4	浙江新益
7	3209 through joint	32090813	12	浙江新益
6	Muffle	XQ131000	2	浙江新益
5	Exchange-way valve	XQ250800U-8	1	浙江新益
4	3175 through joint	31751217	1	浙江新益
3	3209 through joint	32091221	2	浙江新益
2	AC coneection unit	AC3000-03	1	浙江新益
1	3175 through joint	31751221	1	浙江新益

Components easy to be damaged

Name	Specification	Position
Electrode nozzle	φ19X31	Part of heading gun head
Hop-pocket of recycle bin		Recycle bin
Press rollers	φ110	Lifting structure
Electric piece（PHI）	K101222	Clamping structure of driving rollers
Bearing of pressing web	6304-2Z	Part of heading gun head
Electric wheel		Part of machine frame
Pipe for feeding welding wire		Part of heading gun head



Drawing of Lifting drawing