Zhejiang Jinggong Science &Technology Co.,Ltd.

浙江精功科技股份有限公司

HVM-204 Roll Forming Machine

(for user's reference only, details please contact the manufacturer)

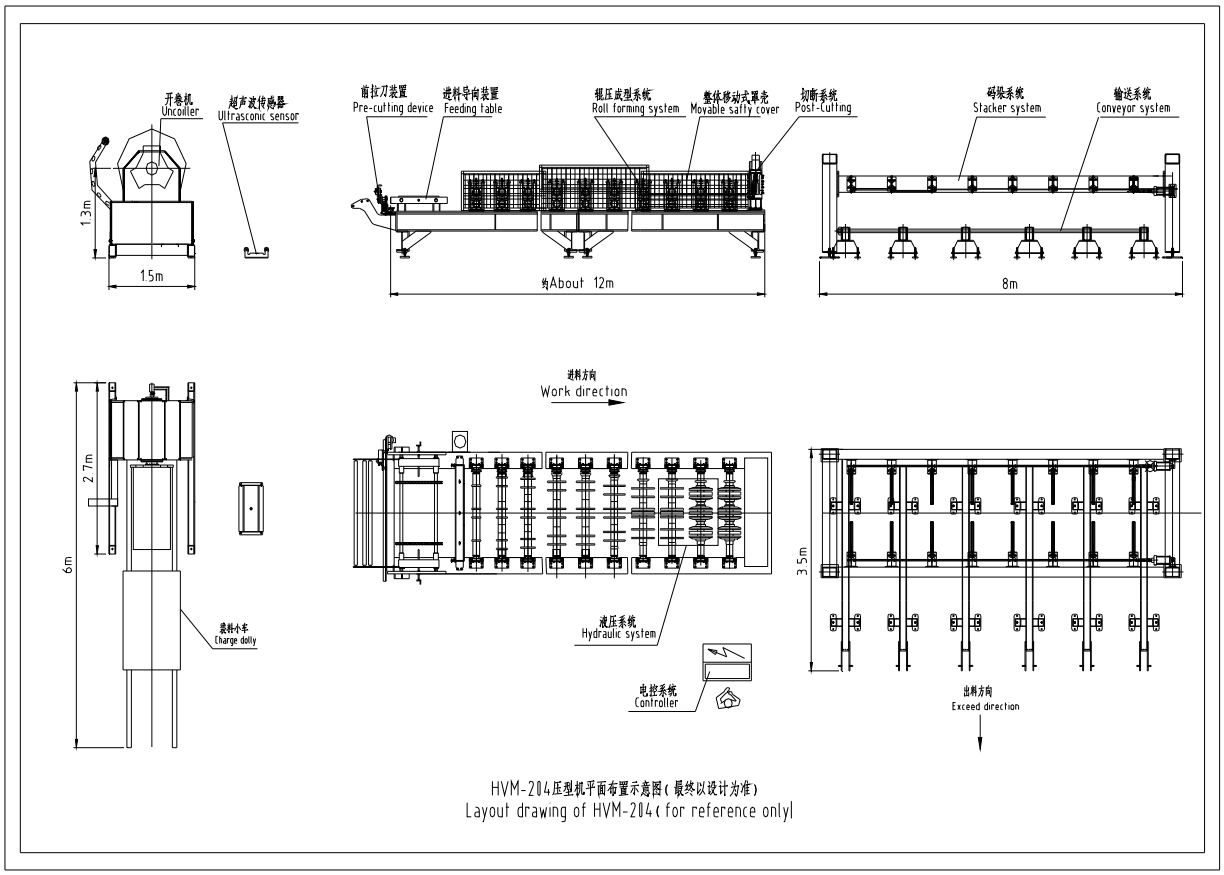
Address: No 1809 Jianhu Road, Kexi Industrial Zone, Keqiao Economic Development Area,Shaoxing, Zhejiang,P.R.China.

Contents

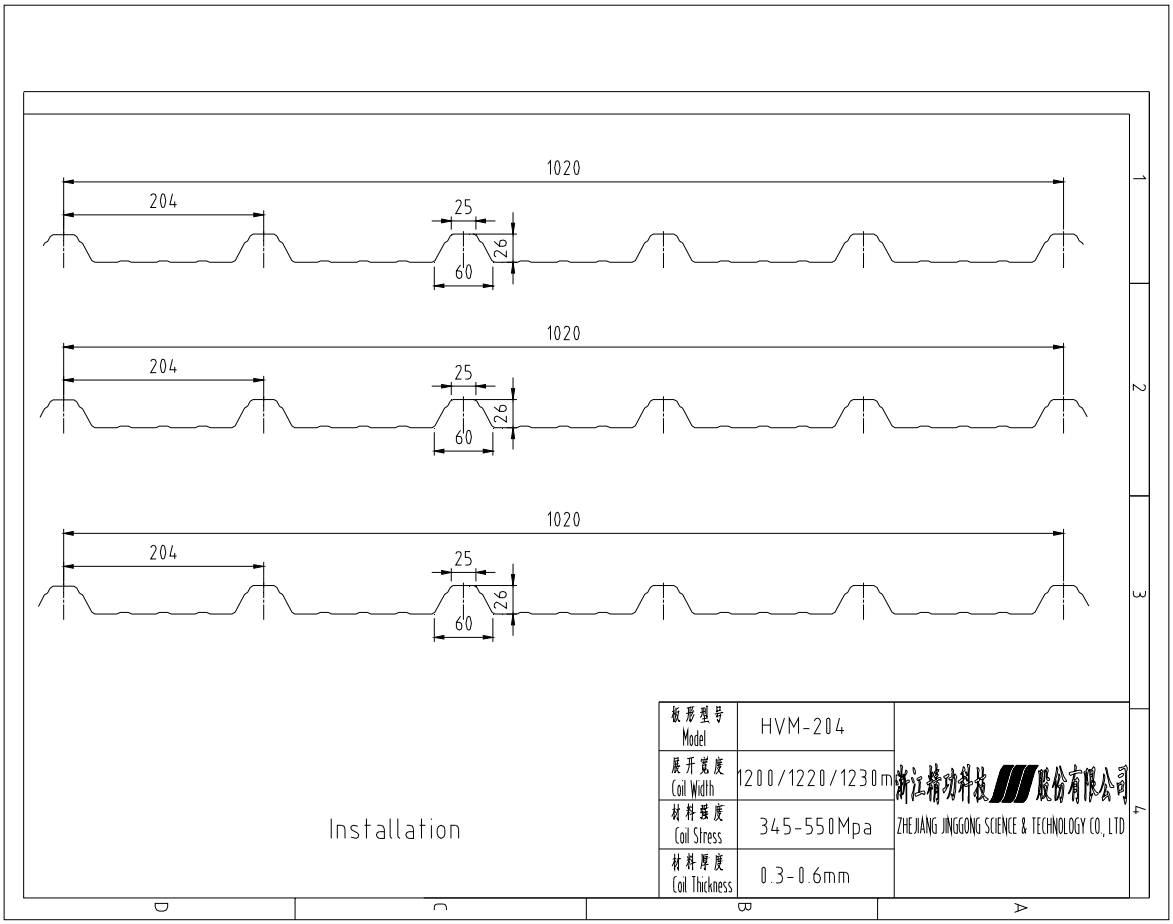
I. Introduction

HVM series roll forming machine is mainly used in the production of wall sheets. This equipment is made up of eight main parts: feeding, transmission, roll forming, cutting, hydraulic station, control station, run out table and full covered safety guard. The machine is artistically made and transmits smoothly at a low noise. The outside view of the machine is illustrated in **Machine Layout Drawing.** The suitable material is galvanized and pre-painted steel sheet. It is used as the roof of modern buildings with better anti-press and anti-bending performance. Its length is set according to customer's requirements and transportation situation. The profile of corrugated sheet is illustrated in **Profile Drawing.**

Machine Layout Drawing.



Profile Drawing



II. Main Parameters

1.Outside Measurements: about 25000 ㎜×6000 ㎜×2000 ㎜

2.Colored Sheets Specifications:

Width: 1200/1220/1230mm

Thickness: 0.3~0.6mm

Stress: 345-550Mpa

3.Forming speed: about 20m/min

4.Roller material: high grade No. 45 forged steed

III. Fundamental Structure and Working Principal

1.Feeding the Machine

Feeding is to put the coil sheet into the mandrel of the uncoiler, the mandrel will expansion through operation on the control panel. After the mandrel is expanded, put the coil sheet to the roll former manually.

During operation, feed the steel sheet into the roller manually, the sheet will be rolled into the machine automatically along the movement of rollers. After the first product comes out, check if it is even on the side of the sheet, if not, adjust the guide roller, the feeding frame and stand until getting even.

2. The transmission of the machine

The transmission of the machine is achieved through the cycloidal reducer to the carrier wheel of the lower rollers, then, through the chains, the carrier wheel to the rollers.

3. The adjustment

Using colored cold rolled steel sheets with 1200/1220/1230mm width and 0.3-0.6mm thickness. Before the feeding of the colored steel sheet into the roller, adjust the space between the upper roller and lower roller, first make the lower roller leveled, then line up the two rollers and then adjust the space between the upper and lower roller to be the thickness of the sheet plus 0.2mm. If the finished sheets have ripples, widen the space between the two rollers until the sheets turned out to be flat. (The space is usually adjusted before the machine leaves the factory).

4. Cutting System

There are two ways in cutting of the products: automatic and manual. The automatic way is used is mass production after the length of the sheets is determined. The manual way is only used in testing.

Before the operation of the cutting system, you must check the oil tank. Hydraulic oil level must reach to the upper line, start the oil pump and set the performance pressure to 15 Mpa, and also test the movement of the equipment to be normal.

When the performance length is reached, the cutter will automatically cut: the machine stop, cut the sheet, touch the lower switch, the blade move up, touch the upper switch, cutting finished, the machine start again.

Hydraulic principle please refers to **Hydraulic drawing.**

Ⅳ. Maintenance and Safety

1.When the colored steel coil is lifted up and moved onto the machine, there be no man under the coil, when approaching the stand of the bearing, should have one person on each side to walk along, erecting the coil and put the coil onto the stand of the bearing lightly.

2.Before production, let the machine operate without load, see if the cutting movements are normal, solve any problem that occurs immediately, make sure the machine run smoothly during production.

3.During operation, make sure the covers of the chain is assembled, and remember do not put your hand into the roller in case of accident.

4.Everyday, before operating, add lubrication oil to the rotating parts of the

equipment to reduce the degree of wear of the machine, the chain and gear of the main motor once a month, reductor once a month.

Ⅴ. Lifting and Transportation

1,Crane or other lifting tool should be used when lift it.

2,There are two holes on each machine wall, use firm tightwire hooks on to the lifting holes, then the machine can be lifted.

3,When lifting there should be no men under the crane or around it in case of accident.

4, During lifting、assembling and disassembling, soft material should be used to prevent the painted surface from scratching and destroy.

Ⅵ. Installation and Testing

1, Check all parts to make sure they are fine and complete.

2, Put the parts of the main motor together and assemble the aligning pin and the stop bolt, adjust and level the length end width of the machine, tighten up the ground screw.

3, The way of adjusting the level

Fill a 10m transparent plastic pipe with water and position the pipe on one spot of main frame. Adjust the foundation bolt, make sure the water in the two ends of the pipe is leveled with the top surface of the foundation.

4, Adjusting the distance between upper and lower rollers

Before the feeding of the colored steel sheet into the roller, adjust the space between the upper roller and lower roller, first make the lower roller leveled, then line up the two rollers and then adjust the space between the upper and lower roller to be the thickness of the sheet plus 0.2mm. If the finished panel has ripples, widen the space between the two rollers until the sheets turned out to be flat. (The space is usually adjusted before the machine leaves the factory)

Ⅶ Hydraulic system

Uncoiler hydraulic system

1 Hydraulic system component

This hydraulic system mostly by five parts form: power element hydraulic pressure pump and electricity pivot;perform element oil vat, motor; control element barter favor valve, throttle, unilateralism valve,decompress valve, folding valve and so on; assistant element oil duct,tie-in oil box, strain oil ware, press watch and so on; work medium adoptN46mark repel grind hydraulic pressure oil. That system press for 15Mpa, tool style view system work principle figure 5.1

2 Hydraulic system degbug and advert proceeding

1）First check-up hydraulic pressure oil whether dnough, hydraulic pressure oil take full of oil boxstyle80% for suitable,if scarcity ,pray complement.Next bases fitting map check-up apiece lind fixing locate whether right tighten.

2）Start-up oil pump electricity pivot,open up press watch on-off, regulate just stir style overfall valve to 5Mpa ,chack-up valve loaf,oil vat oil vitta, tie-in and so on whether have blab phenomena, if have pray screw down or instead,to nothing blab

till. When debugging process hit,cause oil full of pipeline and oil vat, arose oil box mesne oil side drop,so suit in time fill oil avoid oil pump suck empty.

3）Start-up oil pump electricity ,be insure whole hydraulic pressure system without blab,action natural term below, adjust frank act type overfall valve if system press for 15Mpa.Dolly across move motor :let slip lurl plus trig valve locknut athwart hour hand turn screw, press prop,control dolly slowness stop, adjust after screw down locknut;put up flux adjust be time,let slip pile up type timing valve handwheel strict bolt,arrange hour hand turn flux tune handwheel,rule flux minish, adjust after screw down handwheel lock close bolt .Dolly rise fall oil vat:put up press adjust time,first let slip pile up type back press valve lock murt,athwart hour hand turn adjust bolt,press prop ,move to put steel roll after will not slippage,adjust after screw down locknut. Circumgyrate oil vat: measure throttle,inflect oil vat put out speed,arrange hour hand measure lock bolt,rule flux minish,athwart hour hand turn adjust lock bolt,rule flux minish.press stuff arm oil vat:let slip furl plus type decompress valve locknut,athwart hour hand turn adjust screw,press drop,envoy hypo- press for 7Mpa,adjust after screw down locknut;adjust throttle,change oil vat reach speed,arrange hour hand adjust lock bolt,rule flux minish,athwart hour hand turn adjust lock bolt ,rule flux minish.

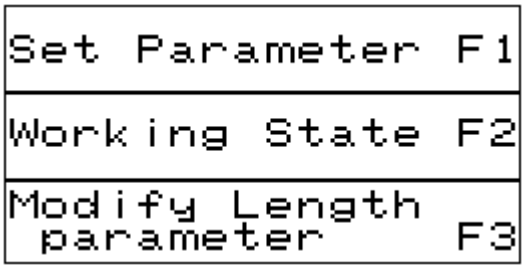
4）One year instead oil fluid once, oil change time cleanout oil box wall,at onetime instead strain oil ware.

Ⅷ. Electric Control

Close all air switches in Control Cabinet, and turn keys to On, the power indicator turn green, and show Screen 1 as below:

Screen 1

Press F1 to screen 2,



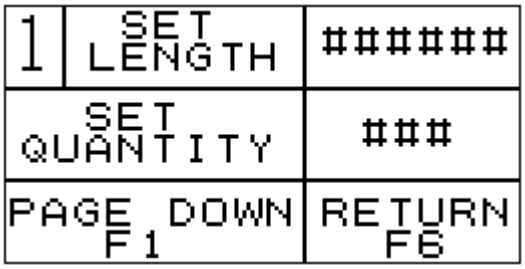
Screen 2

1、Manual operation

In the operation panel, turn key to “Manual”, press “Oil pump start/stop” key to start the oil pump, then can operate with “Manual cut”, “Reset”, “Main frame forward”, “Main machine reverse”, “Main machine stop”, “ Main machine jog”, Expansion Cylinder expand”, “Expansion Cylinder Loose”,” Uncoiler Motor Forward”, “Uncoiler Motor Reverse” etc. if press “Oil Pump Start/Stop” key, the oil pump will stop.

2．Automatic operation

Press the F1 in above screen 2, then following screen 3 is shown:

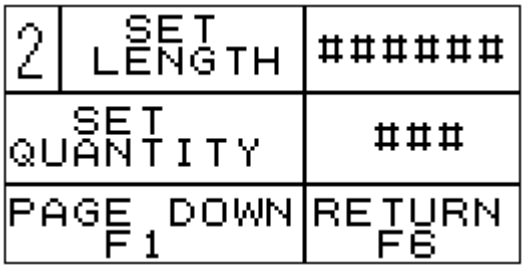


Screen 3

In this screen, you can set the length and quantity of product. Press the "SET " key，then press value key to input the length of product (unit: mm), press the "ENT" key after finishing setting the length of product; press the "SET " key again, press the"▽" key, then press value key to input the quantity of product; then press "ENT" key, finish this operation work.

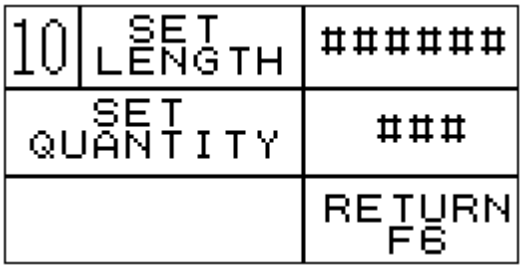
This machine can make ten kinds of spcification product continuoursly. You can set ten kinds of parameters of product at one time here.

Press " F1" in screen 3, screen 4 will appear:



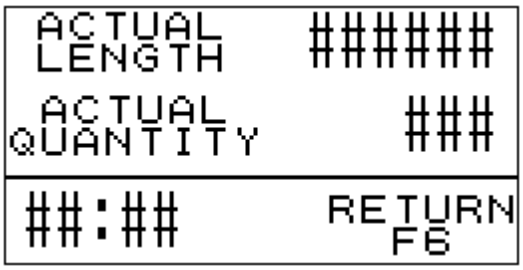
Screen 4

Press " F1" continuously, other groups setting parameters for product length and product width will be come out, until screen 5 comes out.



Screen 5

After finish setting above ten groups parameters, press " F6" , return to screen 2. And press " F2" in screen 2, following screen 6 will come out:



Screen 6

This screen will show the actual length and quantity of product.

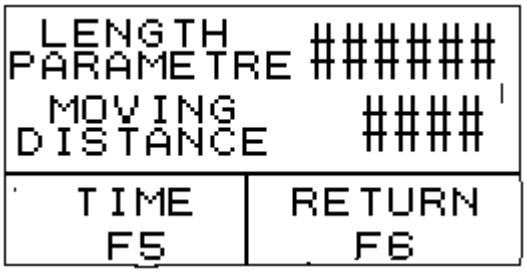
Turn the "manual/ auto." button to the position of "auto.", press the "start oil pump" to start the oil pump, then press the "main motor forward" button， when the machine is in automatic work condition。If you want to stop when the machine is in automatic work condition, press the "main motor stop" button, it is ok. After that, press the "main motor forward" button again, the machine will work again based on the set parameters.

After producing one set of panel with same specification, if want to do another specification product, you must press the "reset" button first to clear the set parameters, then you set the length and quantity of product with other specification. This circular setting operation, which ensure you can do different product with

random length.

3. Parameter for reviseing length：

Press the “F3”key in screen 2，screen becomes to following screen 7. Screen is used to set revised setting and speed down distance.



Screen 7

If the length of product doesn’t match with the set length, adjustment of value of the length Parameter Revise in above screen 7, other parameters keep same:

Revise parameter (new))= [set length / real length] * revise parameter (old) * 100%

For example, the set length is 3000mm，and the real length is 3009mm, then

Revise parameter (new))= [3000 / 3009] * revise parameter (old) * 100%

Remark:

Revise parameter (old) is the value show in Screen 10.

Revise parameter (new) is the value the operator should input.

Precaution

(1) Revise parameter is the fixed length parameter, if the produced panel’s length is not accordance with the set length, change this parameter (use the above formula), the other parameters remain the same.

(2) In case of power failure, the memory function of the machine will let the

machine resume its performance; you don’t have to reset.

(3) The machine has to be grounded properly.

(4) The system’s parameter can revised only by professional man, while the length parameter can revised by common operator also.

(5) All the electrical components should be kept clean, and sweep them once a month.

(6)The door of electrical box must be closed and don’t open it at random, except that you need clean it or adjust it. The system will lose electrical power automatically once the door of electrical box is open, so it isn’t permitted opening the door during work.

(7)Check the insulating condition of every electrical component and the tightness condition of connection places when clean them in order to avoid heating and oxygenation.

(8)If there is wrong for the machine’s running, it only can be maintained by professional man or electrician.

Attached please see:

Common Problems & Proposals

PLC Input & Output Table

Electric Components Table

Electric Working Theory Drawing

Electric Connection Drawing

Common problems and disposal

Problems	Checking Point	Disposal
The main motor doesn't work when working by manual	1. The oil pump motor doesn't start 2. The key switch in "Stop" Position 3. The transducer alarming 4. The limit switch doesn't reach the upper limit position 5. Button spoilage	1. Start the oil pump 2. Switch to " On" position 3. Cut off the power and restart after one minute 4. Let limit switch reach the upper limit position. 5. Replace button
Right in Manual, Wrong in Auto	1. See if having set panel length and quantity 2. See if system's parameters have been cleared	1. Set these parameters 2. Reset system's parameters
	3. See if the green indicating lamp of photoelectric encoder is on, its X0. X1 of PLC input spots wink alternately 4. See if the upper limit switch of cuter reach the relative position and have signal, or to see if they have been spoiled	3. See if the output DC24V is normal and the connection wire is tight, or replace the photoelectric encoder 4. Adjust the limit position to make it has signal or replace limit switch

There is length difference in same batch of panel in auto production.	1. Check whether the connection shaft of photoelectric encoder is spoiled or loose. 2. Whether the wheel for assembling photoelectric encoder is pressing the panel tightly. 3. Whether having amended the parameter of revising encoder.	1. Replace the connection shaft. 2. Re-assemble the wheel of photoelectric encoder. 3. Revise the parameter of revising encoder.
The oil pump can't start	1. Check the 3-phase voltage is normal or not. 2. If the air switch is closed 3. If the fuse is damaged. 4. if the connection of button for oil pump start is in good condition 5. If the oil pump start signal is given to the PLC 6. If contactor of oil pump start is damaged 7. If the heat relay break off	1. Normal 3-phase voltage is 380V±10% 2. Close the air switch 3. Replace the fuse in same specification 4. The action of button should be sensitive, and the connection should be tight. 5. The signal of oil pump start is X7 6. Replace the contactor 7. Reposition the relay

The cutter doesn't work in manual operation	1. The wire of motor for oil pump is assembled opposite 2. If the pump is damaged 3. If the valve core of photoelectric valve is damped 4. If the wire loop of photoelectric valve is burned out. 5. If the wire loop of mid-relay has been burned 6. If the oil pump has started 7. If the connection part has met the upper limit position of cutter 8. Check the signal input and output of PLC 9. If connect point of mini mid-relay is spoiled	1. Ensure the direction of motor and pump is same 2. Replace the pump 3. Clean the photoelectric valve with coal oil or replace it 4. Replace photoelectric valve or wire loop 5. Replace the mid-relay 6. Start oil pump motor 7. Ensure there is signal for cutter up limit. 8. Check the input and output signal. 9. Press the "reset" button
The real length shown on the screen can't reach the set length in auto producing, and no cutting	1. The loading is too heavy. 2. The speed is too slow when in low speed running 3. The brake speed is too fast when in high speed running	1. Reduce the loading 2. Adjust the Pr6 parameter 3. Adjust the Pr8 parameter
The shown length of product doesn't reach the set length when automatic operation	4. the loading is too heavy. 5. The speed is too slow when in low speed running 6. The brake speed is too fast when in high speed running	1.Reduce the loading 2.Adjust the Pr6 parameter 3.Adjust the Pr8 parameter

POWER indicating lamp isn't light. (Programmable)	1. Check whether the electric voltage is normal. 2. Disconnect the end of programmable controller +24V 3. The condition of fuse	1. Suitable voltage: 100~220V 2. Using DC +24V electricity 3. Replace the fuse
ERROR indicating lamp is light. (Programmable)	1. Failure in controlling the work of CPU, or calculating cycle goes beyond the alarming constant set in D8000. 2. See if there's abnormal noise, or there's foreign substance in the programmable controller. 3. See if the condition of ground connection is suitable.	1. Make sure there's no foreign substance in the programmable controller. 2. Connect the ground separately.
Transducer displays E.OC 1	1. See if the accelerating is too fast. 2. Check the circuit and see if it's short circuit or connected to ground.	Increase time for acceleration.
Transducer displays E.OC 2	1. See if the charge has changed suddenly. 2. Check the circuit and see if it's short circuit or connected to ground.	Keep the charge stable.
Transducer displays E.THM, E.THT	See if the motor is used with overcharge.	1. Decrease the charge. 2. Increase the capacity of transducer and motor.
Transducer displays E.GF	See if the motor or cable has fault in connecting the ground.	Solve the problem of ground connection.

The oil pump can't absorb oil or no pressure	1. The rotation direction of motor and oil pump isn't accordant. 2. Transmission key comes away 3. Pass in and out for oil is met contrarily 4. The oil level is too low so that the oil pass-in comes out the oil level. 5. Oil filter is jammed. 6. The pipe-line for suck-in is leakage	1. Correct the rotation direction of motor 2. Re-install the key 3. Correct them 4. Add oil and make it over the min. oil position. 5. Clean or replace the filter, replace or filtrate the oil in oil box. 6. Check the connection of each pipeline, and tighten them.
Oil pump has noise or libration is too big	1. The pipe-line for suck-in is leakage 2. The oil level is too low 3. Oil filter is jammed. 4. Pump shaft and motor shaft isn't concentric 5. There is air bladder in oil 6. The pressure is too high. 7. The screw is loosen	1. Check the connection of each pipeline, and tighten them. 2. Add oil and make it over the min. oil position. 3. Clean or replace the filter, replace or filtrate the oil in oil box. 4. Re-install it and let it reach the precision requirement. 5. Add oil 6. Reduce the pressure to make it below the rating pressure 7. Tighten the screw

The system's pressure isn't steady or flux is too big	1. There is leakage phenomenon in system 2. The screw on pump is loosen because of long time work and libration. 3. The pipeline for suck-in is leakage 4. The oil level is too low 5. Oil filter is jammed. 6. The overflow valve's pressure is too low or it has trouble. 7. The oil pump can't absorb oil 8. The pressure gauge is damaged	1. Check the connection of each pipeline, and tighten them. 2. Tighten the screw 3. Check the connection of each pipeline, and tighten them. 4. Add oil and make it over the min. oil position. 5. Clean or replace the filter, replace or filtrate the oil in oil box. 6. Replace the filter, replace or clean the oil in oil box. 7. Re-adjust the pressure for overflow valve or replace the overflow valve 8. Replace the pressure gauge
The oil vat doesn't work or drunkeness	1. The oil pump can't absorb oil or no pressure 2. The system'e pressure isn't steady 3. Valve core of photoelectric valve is damped 4.Whether the wire loop of photoelectric valve is burned out. 5. Throttle valve is closed off or jamed. 6. Electric trouble 7. There is air bladder in oil.	1. Re-adjust the pressure for overflow valve or replace the overflow valve 2. Ditto 3. Replace photoelectric valve 4. Replace photoelectric valve 5. Readjust the throttle valve or replace it. 6. Check electric 7. Add oil and make it over the min. oil position.