ZLC-300T

Die Casting Machine for Aluminum Alloy Operation Manual

Content

preface

Thank you for your company to choose ZLC series cold chamber die casting machine of ZHENLI.

Sincerely hope the ZLC series cold chamber die casting machine can bring your company development by leaps and bounds.

ZLC series cold chamber die casting machine adopts high quality hydraulic components, high strength casting machine board, high tensile strength of alloy steel rod, and is equipped with industrial computer designed for cold chamber die casting machine. It has a fast speed, simple operation, stable performance, safe and reliable, etc.

Cold chamber die casting machine operation before please read the manual carefully, so that the structure of the machine and operation methods have a good understanding. Manual including the machine's structure, technical parameters, installation, operation, safety, maintenance, troubleshooting, etc.

Technology company due to continuous improvement, product innovation, there may be some content has been changed in the manual, unidentified place please contact us. This manual attached drawings for reference, such as your company needs to make relevant interface, please contact us, please use the confirmation signed by both sides of the drawings as interface data.

\"Do our best to let the customer get satisfaction\" is the most basic requirements of our work, if your company in the use process have any questions or technical problems, your letter, welcome calls to deign to inquire, we will try our best to provide quality services for your company.

Operation manual should properly kept for future reference !

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Chapter1 Configuration list and technical parameter

1.1 Configuration list

Customer	
Delivery date	May 31 2021
Machine model	ZLC-300T
Machine code	ZLC1236
voltage	3 phrase380V
Frequency	
Pump motor power	18.50kw
Controller	Siemens S-7200 PLC
Human machine interface	Siemens 10’ touch screen

Configurations	Specification
Front door	Manual
Back door	Manual
Clamping stroke control	Electric ruler
Ejection stroke control	Proximity switch
Injection position	Three injection positions
Fast pressure and intensifier speed control	Hand wheel control
Core pulling device	1 patches of move core pulling
Plunger lubrication	Plunger oil drip lubrication
Water cooler	SL-518
Hydraulic oil testing machine	Mineral oil

Form 1-1 COLD CHAMBER DIE CASTING MACHINE SPECIFICATIONS

ITEM	UNIT	ZLC300
CLAMPING UNIT		
LOCKING FORCE	kN	3000
CLOSING STROKE	mm	470
EJECTOR FORCE	kN	158
EJECTOR STROKE	mm	110
DIE HEIGHT MIN-MAX	mm	250-650
PLATEN SIZE (HxV)	mm	870×950
SPACE BETWEEN TIE BARS	mm	560×560
TIE BARS DIAMETER	mm	Φ110
INJECTION UNIT		
SHOT POSITION (below centre line)	mm	0, -125
INJECTION STROKE	mm	440
INJECTION PLUNGER DIAMETER	mm	Φ50, Φ60, Φ70
SHOT WEIGHT(AL)	kg	1.3, 2.5, 2.7

INTENSIFIER INIECTION FORCE	kN	336
CASTING PRESSURE	MPa	170, 118, 87
CASTING AREA	cm^2	172, 252, 343
Chamber Flange Diameter	mm	101.6
Chamber Flange Protrusion	mm	12
Plunger Hold Out	mm	165
ELECTRICAL SYSTEM		
DRIVING MOTOR POWER		15Kw
OTHERS		
WORKING PRESSURE	MPa	14
TANK CAPACITY	LITRE	670
OVERALL DIMENSION	m(LxWxH)	6.5×1.7×2.7
MACHINE GREIGHT	Kg	11500

Specification if have modify, will not inform .

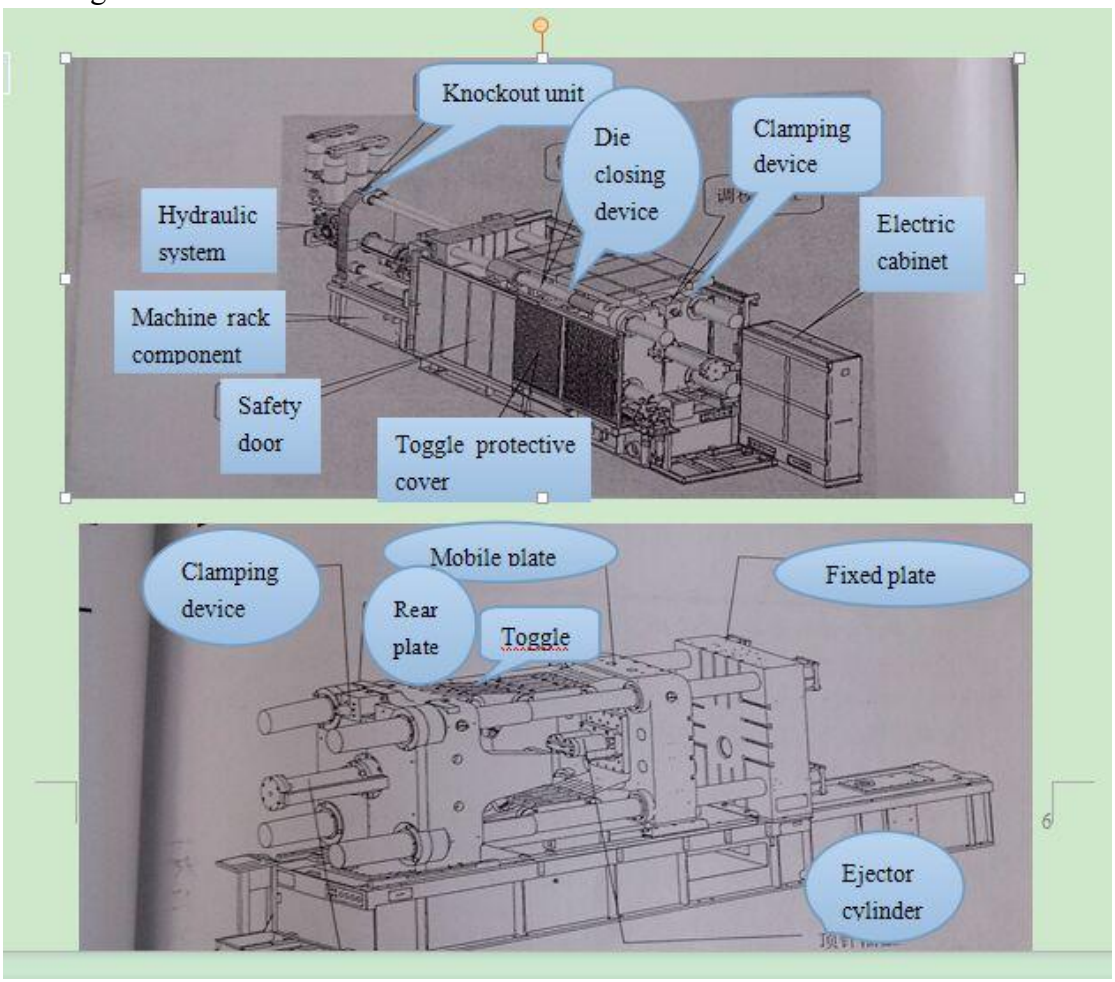
Chapter2 An introduction of ZLC-300T Machine

2.1 A brief introduction

ZLC series cold chamber die casting machines are developed on the basement of more than 12 years' experience, which are widely used to manufacture zinc or brass alloy products in the field of cars, electrical works, electric equipment, toys, household appliances, computers, and etc. This series cold chamber die casting machines are equipped with high-quality imported hydraulic components, highly solid machine rack, tensile alloy steel rod as well as industry-specific computer. Besides, it has the following advantages: advanced design, sophisticated fabrication, fast response, simply operation, being reliable and safe, and running little energy.

This machine consists of control system, hydraulic system, lubrication system, cooling system, clamping system, injection system, machine rack, safety door, and so on. Its main function is to extract a certain amount of molting metal liquid from a separate furnace, and then pour the liquid into the plunger sleeve. When the alloy liquid is completely melted under high pressure, the melting metal liquid will be injected to the template which is put on the plate already, and the die will close, while the high pressure will be kept until the liquid alloy becomes fully solidified.

This chapter will provide a detailed introduction of each part of this ZLC cold chamber die casting machine.



2.2 Control system

This cold chamber is equipped with an exclusive computer as the core component of control system, which can simplify the complex control system and has extended functionality. It is convenient to install wiring, and it occupies small room, which can meet the requirements of all kinds of production. Furthermore, it contains strong hardware and rich programming words.

The control system consists of two parts, namely electric box and the operation panel.

2.2.1 The main electric box

This main electric box consists of many control components. Through the human machine interface in the main electric box, operator can input parameters and then reset the parameters according to the real situation.

2.2.2 The operation panel

In general, the operation panel is placed on the operation side. Operator can start up, control and adjust the machine through this panel, which can ensure the regular production of this die casting machine.

2.3 Clamping system

The main function of this clamping system is to provide precise positioning and orientation to the template between the movable plate and the stationary plate, to ensure that the die can open and close precisely and safely, and also to eject the products. More importantly, this clamping system can provide sufficient locking force to ensure that in the process of the high-pressure, injection, the mold has been in the state of being closed. The following text will offer a detailed introduction of its layout.

2.3.1 The layout of the clamping system

The layout of this clamping system, a hydraulic drive along with toggles, is quite popular at home and abroad, which is compact, reliable, reasonable and easy to maintain. The high-strength ductile cast iron plate, toggles, tensile steel pin and rod, all of these can ensure the intensity and stiffness of the clamping system, and also can achieve the maximum locking force.

2.3.2 The core part

In order to fabricate better molds, this machine is equipped with a number of core pulling control valves and limit switches, so that customers can install the core pulling cylinder and other core puling devices. But the quantity of the core pulling control valves and limited

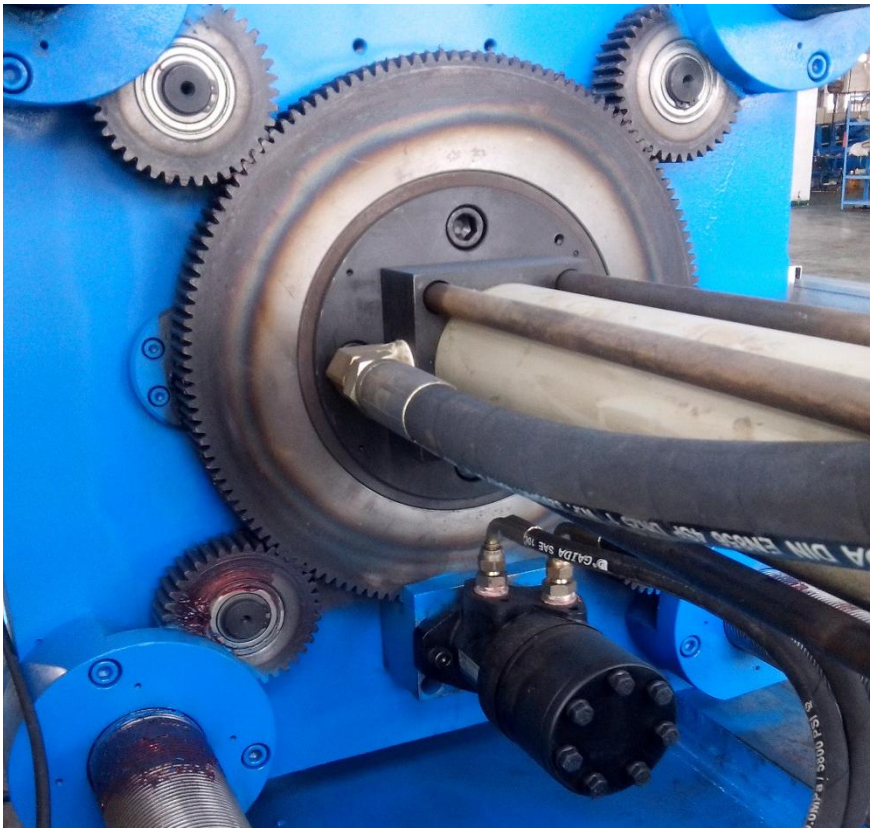
switches depends on customers themselves. The running order, pressure and speed of those core pulling devices can be set and programmed in the PLC.

2.3.3 The hydraulic ejection part

The hydraulic ejection device is set in the north of the movable plate. In the way of hydraulic cylinder ejecting, the distance and the frequency of ejection can be adjusted, which can meet the needs of different casting ejector configuration.

2.3.4 Mold adjustment part

The mold adjustment part is composed of motor and gear device. Its speed can be reset according to customer's need within the practicable range. Its smooth transmission, low noise, easy adjustment can make the replacement of template and the adjustment of the locking force more easy.



2.4 The injection system

The driving force of the injection system comes from hydraulic pump and energy accumulator.

The whole process of the injection can be divided into four phrases, namely slow speed, one-shot, two-shot and pressurization. The purpose of the slow-speed injection is to make the injection plunger move slowly and smoothly and to seal the spout, and then to ensure the

liquid in the plunger sleeve can rise steadily. In this way, the air in the plunger sleeve can be squeezed out gradually, and we can prevent the metal liquid from splashing out. Next, the injection plunger move in the velocity of the one-shot so as to fill the front part of plunger sleeve with metal liquid and accumulate in the spout. And then whole spout and cavity will be full of metal liquid. If you have special requirements on the surface and the quality of the products, you need to intensify the pressure after two-shot. In the phrase of the pressurization the relatively high pressure can provide high density of the castings and then reduce the contraction caused by cooling.

After the slow-speed injection but before the fast-speed injection, some die casting machine will add one-shot according to different needs. The speed of the one-shot will be higher than that of the slow-speed injection, but it will speed up the injection, and can secure the smooth transition from slow-speed injection to high-speed injection.

The transformation among slow speed, one-shot and two-shot will be determined by the position of the injection plunger. And customers can detect the injection stroke through the non-touch sensor, while the pressurization is triggered by the pressure or position.

There are two energy accumulators, one of which is uses for one-shot and two-shot while the other of which is used for pressurization. Those two accumulators can provide the energy for machine to inject, but the energy needed in each cycle is controlled by controller.
Since the accumulators are installed on the injection cylinder, it can save the need to connect lines between these two, and reduce the pressure drop during the injection, and also increase the energy for injection. Because of the lack of back pressure, the pressurization can be started up quickly. But the injection speed, injection force, and the time needed to build pressure are step-less.

2.5 The hydraulic system

The transmission of energy in the hydraulic system is realized through different hydraulic components and circuits, which can make die open, injection and mold adjustment of this machine possible. Hydraulic system is the core part of the machine, and it provides energy to the whole machine and ensures the normal operation of the clamping part, mold adjustment part and injection part. The hydraulic system consists of motor, hydraulic pump, cylinder, hydraulic control components, oil pipe, filters, accumulators, and so on.

2.6 The lubrication system

The clamping system and the injection system are equipped with automatic lubrication system or manual lubrication system. Automatic lubrication system is suitable for those parts which have to work frequently, such as toggle pin, cross guide rod, movable plate gasket, plunger and so on. The lubrication pump will lubricate the machine regularly through the pipelines and the distributor. What's more, the interval and times of lubrication can be set by the PLC, and when the liquid level and pressure are abnormal, the lubrication would give an alarm.

The plunger lubrication system consists of cylinder and valves, and it can lubricate the plunger by pressing the correct buttons on the control panel manually.

2.7 Safety door

The square beam of the safety door is placed on the front and rear part of the clamping system. Its main function is to avoid extrusion in the process of clamping and the splashing alloy liquid will cause unexpected injury. This door can be moved manually, and it is equipped with an anti-return device. But customers can choose pneumatic door or servo motor control door.

Note: In the process of the clamping, the safety must be closed.

2.8 Machine rack

The machine rack is welded in the shape of H, while the injection system and the clamping system is in a monolithic structure. Internal tank of the rack is also the tank for oil, which is used to provide oil for injection part and hydraulic system. Besides, it is also equipped with indicator for the level and temperature of the oil, air filter, and reflux device for waste water and waste oil.

2.9 Cooling system

This cooling system is mainly designed for hydraulic oil, injection plunger, fixed plate, the die-casting plate, while its function is to help the machine effectively dissipate heat, and to ensure the machine can perform stably and regularly.

Besides, this machine is equipped with hydraulic oil cooling system, and with whole set of water cooling pipe connector. The cooling water will return back to the collector, so operator can easily check whether the cooling system is regular or not.

The hydraulic oil in the hydraulic system should be placed within the temperature from 40℃ to 50 ℃. In general, the highest temperature can not be higher than 55℃, while the lowest one is at least 15℃, for the too high temperature will damage the hydraulic oil, which will reduce the efficiency of the hydraulic pump, whereas the too low temperature will make

it difficult for the pump to suck oil. In order to keep the hydraulic oil at a stable temperature, the tank will be usually equipped with a water cooler. Before starting up the machine, operator will first check the water cooler has cooling water, and then open the valve when the ambient temperature is above 20 ℃.

Chapter3 Cautions

3.1 Warnings signs

¯lectrical shock can cause harm even death.
When maintaining the machine, please cut the power supply.

fter starting up the machine, you are not allowed to
ıch the machine. All panels and cover should put in the
rrect position. Besides, operators should were put on dry
ınsulated gloves, safety clothes and safety shoes.

ıloves and safety shoes and clothes should be kept right.

. ıne spilling and leaking greasing oil must be removed.
Operator should comply with the local safety standards.

Operator can enter the dangerous place after taking precautions.
Destruction to the pressure vessel will cause explosion.

oise will cause damage to your hearing.
ıperators should wear ear muffs.

verheating will cause fire or burn.
Do not damage the containers with flammable items.
Wear goggles or other protectors.

Only those trained and qualified people can operate the machine.
The sprayer can not pointed to the operating area.
When entering the dangerous place, operator should cut the power supply first.

3.2 Safe operation

Avoid to be getting electrical shocked.

When heating the furnace with high-voltage electricity, operators should take the following precautions:

- Keeping bodies and clothes dry.
- Not putting switches on the wet surface.
- Keeping in good insulation. When working in the wet places, operators should put on insulated gloves and clothes.

- Off switch on the wall should be equipped with a fuse which enables operators to disconnect the power quickly in an emergent situation.
- The size and type of the main wires must be in accord with the local electric codes.
- To check whether the main wire is in good condition regularly. The broken or damaged wire will cause harm even death to people.
- Operator can press the circuit switch only when the cover of the power device is in a good condition. If the power connection are exposed, it will cause serious accident.
- Absolutely not allowed to simplify the safety interlock device.
- When removing the power supply cover for maintenance, operators should firse disconnect the power supply and wait for about five minutes, so the capacitor can discharge in case of serious electricity hazard events.

Preventing fires

- Turning on or off switches will produce sparks. To prevent fires, the following measures should be taken:
- Extinguishers should be put near the switches.
- Flammable items should be kept at least 35 feet away from the switches. (10m)
- When the metal scraps in the processing are together with flammable items, those scraps must be quenched or gone through other cooling process.
- Never allow to destroy the container with flammable materials by electrical short. When destroying a container, operator should remove the leftover first.
- The place with switches should be kept ventilated. And the switches should not installed in the place with flammable powder, gas, or liquid.

Fire extinguisher

Since the mixture of molten metal, fuel in furnace, hydraulic oil, lubricating oil and greasing oil, there exists potential hazards around the die casting machine.

Flammable materials could not be placed around die casting machine and the furnace. Around the die casting machine should be equipped with fire-fighting equipment and emergency exits in case of fire, and the operator should be able to skillfully use the fire extinguishers, while leaders should provide their workers free fire training.

Operators should different extinguishers according to the level of the fire.

Level-A : water extinguishers, for paper, wood, textiles fire;

Level-AB: foam fire extinguisher, not only for A-level fire, but also for oil flammable liquids;

Level-BC: CO2 fire extinguisher, not only for Level-B fire, but also for electrical fires;

Level-ABC: powder fire extinguisher for lever-A, AB and BC.

Lever-D: molten metal magnesium fire

In general, we recommend powder extinguishers in factory.

3.3 Knowledge of safe operation

1. Before starting up the die casting machine, operators must read the manual carefully, to learn more about the machine and safe operation.
2. Do not put the die casting machine in the humid or high-voltage place, but a place which is dry and ventilate.
3. Keep the machine body and surroundings clean.
4. Please stay away from electromagnetic interference.
5. Please reset the machine parameters after your second thought, for our machine has set

the most suitable line pressure before delivery)

6. When in maintenance, non-professional operators can not dismantle the machine without guidance.

7. When something is wrong with the machine, operators must make sure the machine is in the state of “under repair” in case of electricity leakage and oil leakage.

8. Before starting up the machine, first open the safety door, and then make the machine die clamp manually, which can check the whether the safety door can open and close automatically or not.

9. Do not dismantle the safety door and other safety covers.

10. Do not touch the moving part of the machine in case of personal injury or damage to the machine.

11. To maintain the workshop clean and dry, and do good job in 5S.

12. When operating, do not touch the plunger sleeve, in case of getting burned.

13. When lifting the machine, please strictly abide by the lifting rules and regulations.

14. When repairing machines, please drain off the high-pressure oil in the accumulator. When checking the N2 accumulator, operators need to drain off N2, and turn off the motor and the main power supply.

3.4 Prevent the skin from getting burned

ring protecting suit

ring long-sleeve protective gloves and shoes
ring flame-retardant clothing to cover bare parts of your body
enting sparks or iron slag from coming into your shoes.

Explosive

1. You are allowed to smash other containers near the those place with explosive powder or gas.
2. You are allowed to destroy the cylinders with pressure inside or other sealed containers.

When connecting with the ground, you should:

- You must connect the ground wire with the ground outlet correctly, or with the ground terminal in the panel.
- When installing the switches, you must connect the ground wire. The way of putting ground wire must abide by CSA standard.
- First connect the ground wire with the buried bolts, and then put other wires on the ground wire, and then tighten the nuts.
- To ensure that all the parts are connected safely and correctly, and to avoid overheat.

Chapter4 Installation and preparation

4.1 Hoisting machine

When lifting the assembled machine, you should abide by the following instructions. Before the final positioning of the machine, operator should make sure that all screws have been tightened, and then tighten those screws on a year's base.

4.1.1 Preparation before hoisting machine

Those machines whose locking force is more than 400T are suitable for the package as a whole, but it depends on the actual situation. Those machines whose locking force is more than 500T should be dismantled into several parts before delivery. Also, it should depend on the real situation.

4.1.2 Safety precautions when hoisting

When hoisting the machine with a hook or a string, operators should keep the machine horizontal. If the condition permits, operator should not hoist the machine above the ground higher than 1.5M. When hoisting the machine, pay attention the following points:

1. Keeping the machine horizontal.
2. Prevent the front door, backdoor and other devices from getting together and deformation.
3. If the accumulator is on the machine, please protect the accumulator from scratch.
4. Protect the junction box and operation control panel from being damaged or scratched.

4.1.3 Hoisting machine

Based on the weight of the machine, pay attention to choose the suitable lifting rode or hook. (the weigh of the lifting rode or hook can bear should be larger than the weight of the machine at least 5T or more .)

1. The steel rope should hang tightly with the support rod.
2. The other end of the steel rod should hang with the machine hinge.
3. Carefully lift the machine, to protect the safety door.

When hoisting the machine, please don't directly lift the tie bars, and pay attention to other protecting precautions, for example, wherever the rode will touch, operator should take precautions, adding some cardboard or rags.

After the machine is put back on the ground, please remove the hoots or other lifting devices.

4.2 Preparation for Installation

Before installing the machine, please give more thought to the choice of place and installing environment. Operators need to consider that the environment how to serve the machine and to satisfy the needs of the machine. Besides, operators should pay attention to the future expansion and the automatic installation of machine.

4.2.1 Operation Environment

Machine should work under a room temperature. For the convenience of machine' operation, maintenance, and inspection. Workers must provide sufficient space, at least 1M. And the distance between two sets of machines should be 10M or more. Please provide good lighting, especially for the clamping part and operation place.

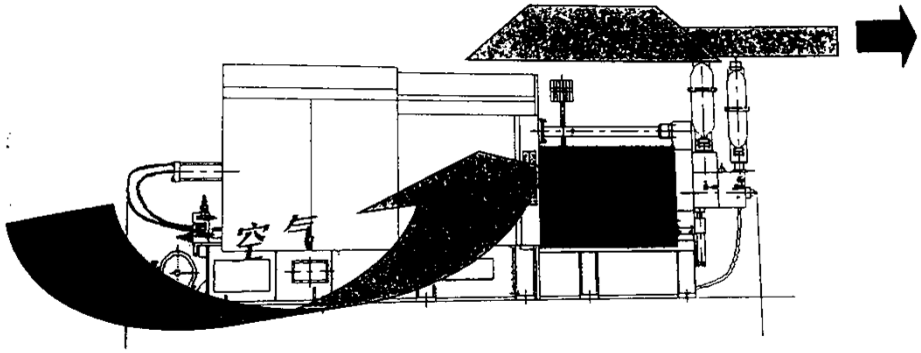
To prevent workers from entering dangerous place, a security fence is needed. But the security fence needs to meet the requirement of level3 or 4 of CE. Besides, please provide enough room for furnace and other ancillary devices, such as the pulling rod. Working place should keep ventilated, to exhaust the gas from furnace.

Attention must be given to the fire.

Flammable materials can not be placed near the furnace. And operators should prepare enough easily-operated extinguishers. We strongly suggest that those factories which produce zinc alloy, brass alloy, and aluminum alloy products should prepare Level-c powder extinguishers, while those factories which produce magnesium alloy products should provide Level-D powder extinguishers.

4.2.2 Exhausting gas and Ventilating

The wasted gas is mainly from furnace, and this wasted gas can be exhausted outside the factory by using the fans. When exhausting the wasted gas, windows should be closed tightly, to prevent the wasted gas will come back again. But the opposite windows should keep open for ventilation. Furthermore, the heat produced from castings or hydraulic oil can also be excluded through the fans.



4.2.3 Tool Shelf and Recycling Point

Tool shelf is for the storage of tools, such as scoops, clips and copper, while the recycling point is for the temporary stay of unqualified parts.

4.2.4 Furnace

Each set of die casting machine is equipped with a furnace. There are various of furnace. While choosing furnace, you should take installation position, size, and the melting way of iron into consideration. In general, there are two kinds of melting ways, namely centralized melting and self-melting. If you choose the former, you should also consider how to convey the melting liquid. No matter how you will convey the melting liquid, it is very important to prevent the molten liquid from splashing around. All open furnace should stay ventilated.

4.2.5 Fully Automatic and Other Auxiliary Devices

Die casting machines can be equipped with peripheral equipment, to make fully automatic operation possible. But before installing machine, you must leave enough space for those peripheral equipment. And you should consider the motor.

4.2.6 Crane

Crane is used to load and unload machines. You should choose a suitable jack according to the weight of the mold. When hoisting the machine, the crane can not crash the ventilation line and accumulators.

4.3 Base

A solid base is the key to ensuring the machine can run correctly as well as to ensure a long working life.

Due to the fact that the geology of an area is different from place to place. And also different places will have different regulations to the geology. Thus, as for the design of the base, we will not make any recommendations. But because of the heavy weight of the machine and regular operation of it, we suggest strongly that you should take a further thought to the choice of the base. For the convenience of the maintenance and good running of machine, the base you choose should bear the following characteristics:

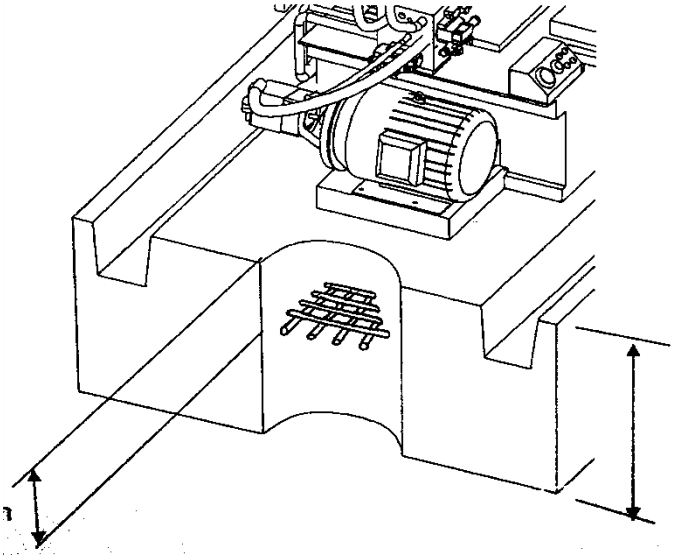
1, solid enough to prevent any deformation.

2, a high level of parallelism.

3, not easy to collapse

We suggest the level of your concrete base can reach C30, and the you should reserve at least 300mm space from the edge of the machine. The quantity of steel bars under the ground

should not be less than 16,(the mesh should not be more than 200mm square). Of course, all of the material which your ground needs should be provided by yourself. To provide a clean surroundings for the die casting machine, you should build a drain near the machine, to discharge wasted water and oil.



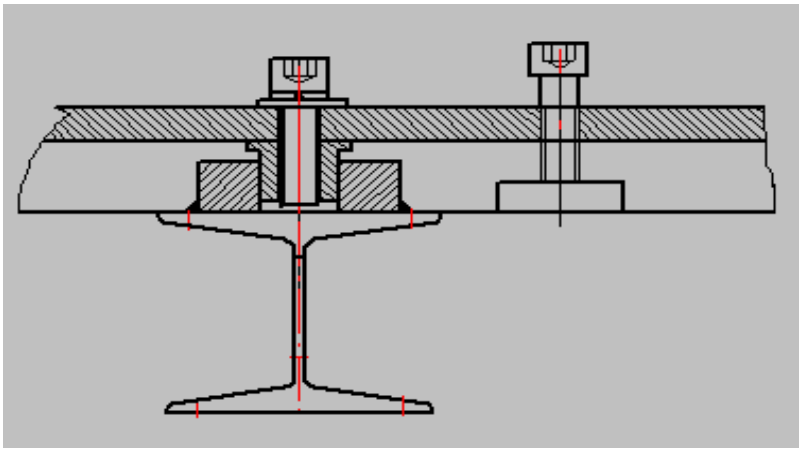
The depth of the concrete foundation

4.3.1 Three Ways to Install Machine

(1) Wedge

This method is suitable for the installation of various of machines and those machines which will work permanently in a place. Later we will give more details about this method.

(2) H Screw(Adjustable Screw)

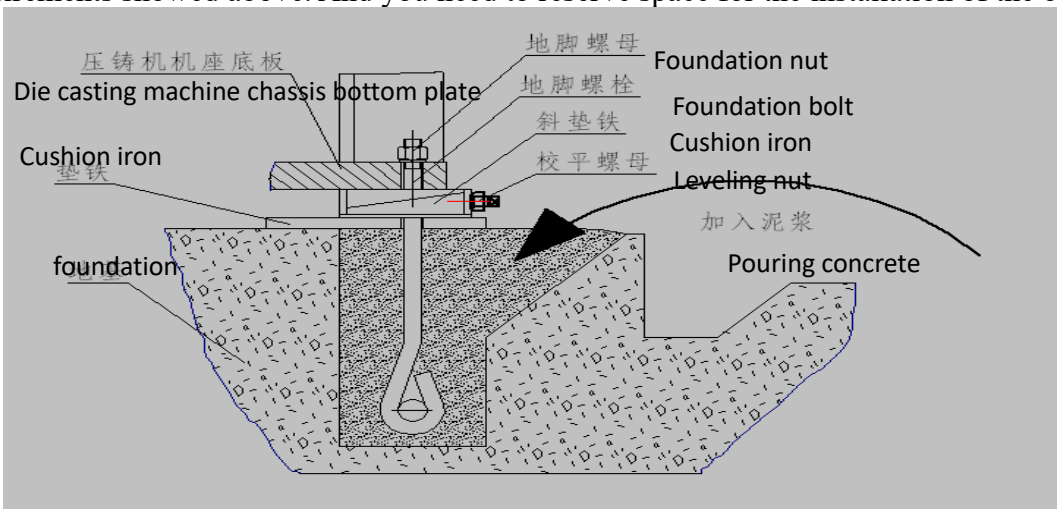


(3) Foot Shock

This way is merely suitable for 400T die casting machines and those machines which work in a place temporarily.

4.3.2 The Way of Inst...

If you install your machine in this way, you should make your concrete base according to requirements showed above. And you need to reserve space for the installation of the bolts.



Noted: Your newly-made concrete base can be used after at least one week.

The installation step is as followed:

1. The hole for bolts on the machine should exactly match the holes on the ground.
2. And then you can lift the machine with your crane.

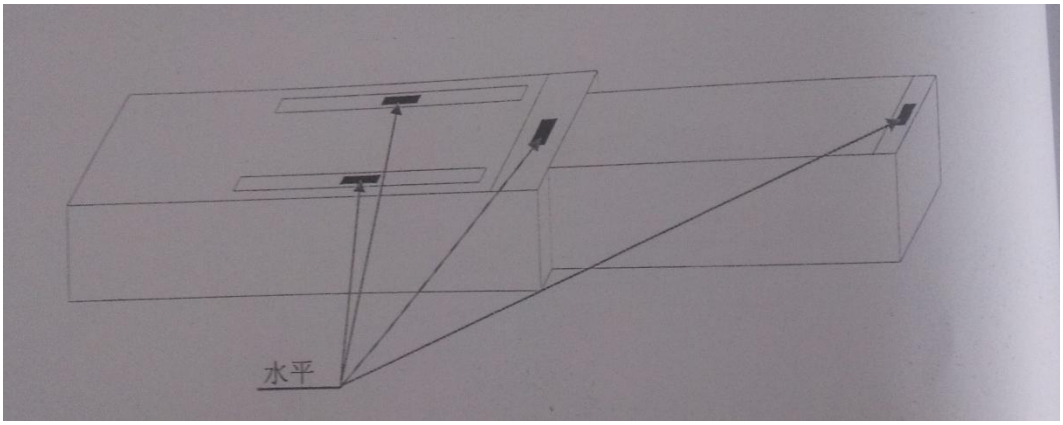
3. Put a steel board above the hole, fix the bolts.
4. Lay down the machine slowly.
5. After adjusting the machine, and keeping it parallel, you can pour the concrete mud.

4.4 The Installation and Calibration of the Rack

After positioning the rack and fixing the bolts, you need to adjust the position of the rack to ensure each of them is on the same level horizontally.

Put the level on the plate, and correct the position of the rack vertically.

And then put the straight ruler on the horns of head plate, middle plate and the third board; later, place the level on the straight ruler, to correct the position of the rack horizontally. Please ensure that the levelness of the rack vertically and horizontally will be less than 0.2mm / M.



4.5 The Installation of the Machine

The machine will be divided into several parts according the needs of delivery during delivery. With the completion of the concrete base, after the calibration of the machine rack, the next job you need to do is to reassemble the machine and connect those ancillary equipment, such as water, electricity, and compress air, etc.

4.6 The Steps of the Installation

1. First position the machine rack on the ground, and then install the die lock part, if the die lock part is dismantled before delivery. Please pay attention, when you finish installing the die lock parts, you need to remove your hook in the rear board as soon as possible.

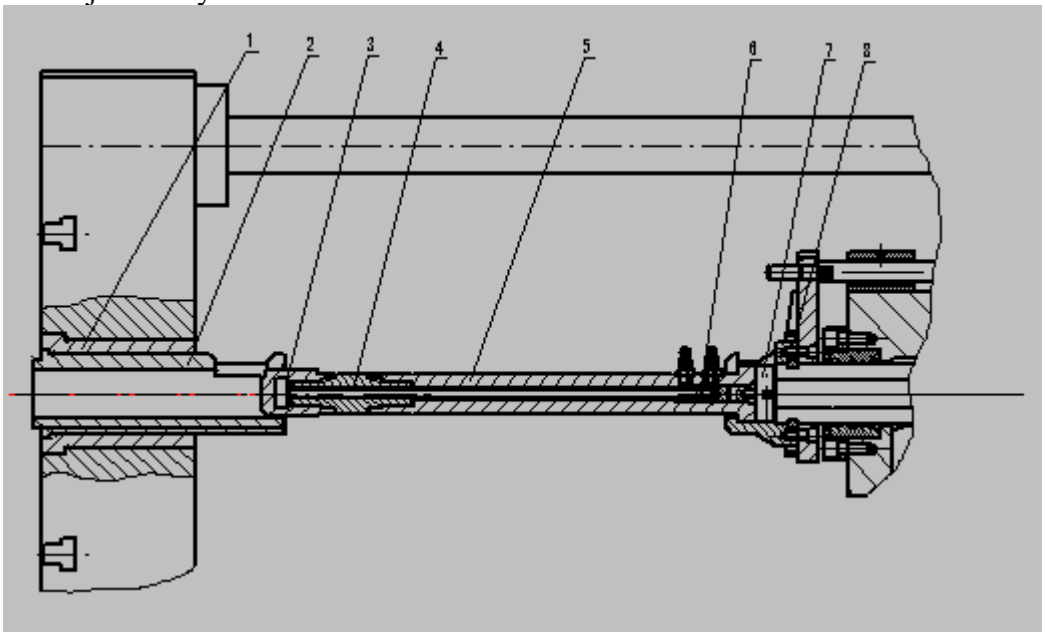
2. Install the injection parts, if they are dismantled during transit. And you should adjust the position of those parts and the fixed plate when installing.

3. And then you can assemble the accumulators.

4. Next, please assemble the safety door and others protective devices.

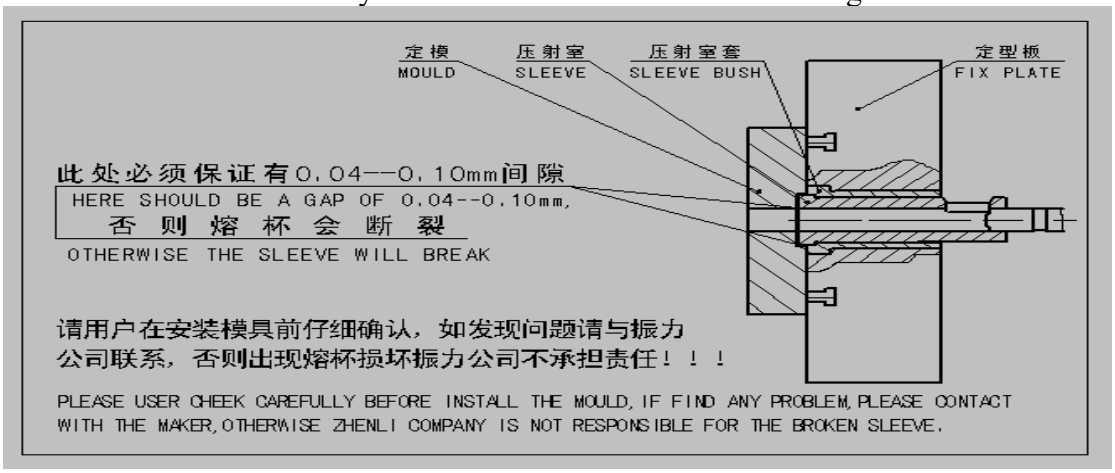
5. You can install the injection plunger, coupling and plunger sleeve between the fixed

plate and injection cylinder.



1	2	3	4	5	6	7	8
Collar	Plunger sleeve	plunger	connector	Plunger rod	Water core	Cushion	coupling

Please to see that when you finish installing the collar, the whole plunger sleeve can not be higher than the fixed plate. Also the diameter as well as the height of the flange after installation should be strictly in accordance to those of the drawing.



4.7 The Connection with Other Appliance

It is an important part to connect the other appliance with the machine after positioning the machine on the ground.

4.7.1 Wire Connection

1. Wire will connect the machine and the panel, mainly in the following cables:

1) The signal wire and other wires between the machine and the panel:
To facilitate the connection, this machine is equipped with multi-core cables with clear indication.

2) for the motor, you should connect the oil motor and the panel with cables.

3) in some cases, you can use sensitive and protective cables to connect the sensor and the panel, which allows no terminal.

2. The wires outside the panel

1) according to the needs of the machine, the power supply must comply with the following requirements: China Voltage: AC380V; Frequency: 50HZ;
Voltage fluctuation: within ± 10%. Foreign voltage refers to the contract.

2) according to the choice of base for machine, you should choose the power supply air switches.

3)when wires is connected, please ensure that those exposed wires need external protector to avoid any damages. Also, those wires of the corresponding number must match the terminals of the same number, and tighten the connector respectively.

4) after all the wiring is completed, be sure to recheck and allow no mistakes.

Note: The neutral wires and protective earth circuit should not be linked, and you can not use EPN or terminals!

4.7.2 The Installation of the Water Cooler

We strongly suggest you use the water cooler to provide cool water for the machine, for the the water from normal water supply will not have stable flow, pressure, and temperature. We also don't suggest running water. Before purchasing water cooler or water tower, please contact the supplier. And when installing the water cooler, please add some anti-rusty and anti-corrosive materials to the cooling system.

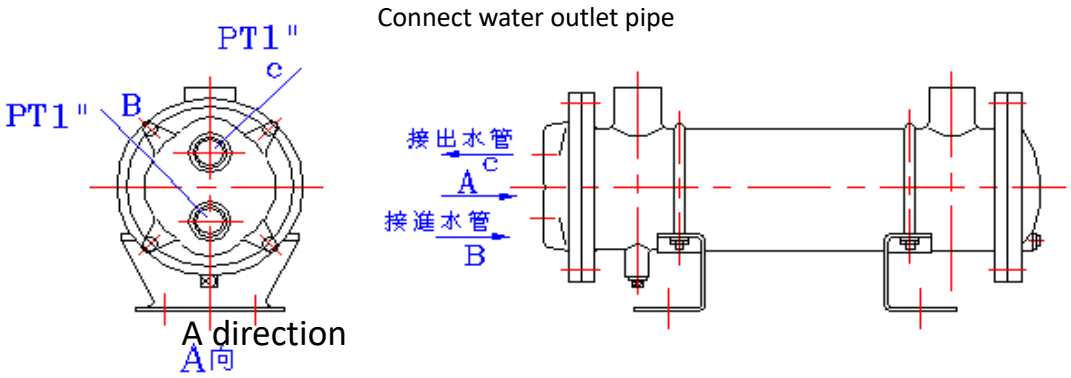
The cooling water is used to lower down the temperature of hydraulic system, the head plate, plunger and the mold.

Requirements of the water supply:

Item	Setting Value
Pressure	3bar-5bar
Temperature	5℃-25℃

Cooler

This machine is equipped with a cooler with pipes. As for the inlet and outlet of the



cooling water, please refer to the following drawing.

(A is connected the outlet water hose, B is connected the inlet water hose)

Notes:

1. When supplying water, the pressure and temperature inside should be lower than the setting value.
2. For convenient maintenance, you should install a throttle at the inlet and outlet respectively.
3. You should use freshwater to cool the machine, whose performance is as followed:
4. You should check the tank regularly. When the oil temperature is over 55℃, you should stop the machine and then check what is going on.
5. Every half of a year, you should clean the cooler inside.

Item	Unit	Cooling water	Running water
PH（25°）		6.5~8.0	6.0~8.0
Conductivity	μs/cm	<800	<200
solidity（$CaCO_3$）	Mg/ |	<200	<50
（C1–）	Mg/ |	<200	<50
（SO_4^{2-}）	Mg/ |	<200	<50
（Fe^{2+}）	Mg/ |	<1.0	<0.3
（S^{2-}）	Mg/ |	0	0
（NH_4^+）	Mg/ |	<1.0	<0.2

4.7.3 The connection with the compressed air

The plunger lubrication part of this machine needs the the compressed air. Put the sucker into the oil tank, suck the oil, then shot the oil to the plunger. In that way, the plunger will be lubricated. There are two ways for the connection, namely:

1) with an alkyne tube whose diameter is ¢ 9, connect the compressed air with the rubber hose nozzle.

2) switch on the throttle of the compressed air, and then check the whether the pressure can reach 5bar ± 0.5 bar. If the pressure is not within this range, please pull up the pressure regulator until you hear the " click". Next, you can adjust the switch to make the pressure reach ± 0.5 bar. (the same way as arrow means increase, the reverse means decrease). After adjustment, you can press the adjustment switch.

4.8 Hydraulic oil

The machine needs hydraulic oil when working. More details of the hydraulic oil are given:

Type	Description	Suggestion
Water glycol	Not flammable, hard to get fired.	WG46 is recommended.
Mineral oil	It has a high flash point but it is not easy to get burned, but when fired, it will be also flammable easily. Not good as water glycol.	Recommend to use 68 # hydraulic oils, and to use 46 # hydraulic oils in a cold place

In general, customers can choose water glycol or mineral oil as hydraulic oil, and these two kinds of liquid can not mix and then use. If customers want to order other kinds as hydraulic oil, you should tell us when placing an order.

4.8.1 The quality index of the hydraulic oil

The following chart of the detailed description of the WG-46 water glycol.

Items	Quality index	methods
Kinematic viscosity（40℃/$mm^2 \cdot S^{-1}$）	41~51	GB/T265
Viscosity index not smaller than	140	GB/T2541

PH value	9.1~11.0	GB/T7304
solidifying point/℃ not higher	-50	GB/T510
density（20℃）/g·cm^{-3}）	1.0~1.1	GB/T1884
Gas Corrosion	Not rusty	Referred to others
Liquid corrosion（A法）	Not rusty	GB/T11143
Corrosion test, copper， 100℃,3h） Not bigger than	1	GB/T5096
The largest non-card bite load（Pa）/N	686（70）	GB/T3142
Wear scar diameter （296N）/mm	0.60	SH/T0189
Manifold heat flame resistant test（704℃）	Passed	SH/T0567

The following chart is the quality index of the 46# and 68# mineral oil.

Item	Quality index		Test Method
	46	68	
Kinematic viscosity/ mm^2·S^{-1} 0℃ Lower than 40℃	41.4~50.6	61.2/74.8	GB/T265
Viscosity index bigger than	95	95	GB/T2541
Spark point /℃ opening higher than	180	180	GB/T3536
closing higher than			GB/T261
solidifying point/℃ lower than	-9	-9	GB/T3535
Air releasing value （50℃）/min smaller than	10	12	GB/T0308
Sealing adaptability index smaller than	10	8	GB/T0305
Demulsibility（40-37-3）/min	30	40	GB/T7305
Lower than 82℃			

Mineral oil's brands

Supplier	Specification
ESSO	Nuto H68
HERCUL	Zona 68
MORESCO	AW-68
SHELL	Tellus 68

Water glycol

Suppler	Specification
CHEMTRENC	HF620
HERCULES	Zona HFR32/46
MOBIL	Hydrofluid HFC46
SHELL	lrus Fluid C46

Notes:

1. The above charts are listed according to the order of the letter.
2. Please don't mix the water glycol and mineral oil and then use. If you want to change another kind of hydraulic oil, you should clean the hydraulic tank before pouring the new one.
3. Hydraulic oil of different brand can not mix. If you want to know more, you can contact the supplier.
4. Before delivery, we will have a test run for the hydraulic oil you order. If you are not sure, you can contact us and consult our technicians.
5. The temperature for hydraulic oil should not be lower than 15℃ and not higher than 55℃. When the temperature is higher than 55℃, please stop the machine and check.
6. We will bear no responsibility if you buy hydraulic oil for the machine yourself.

4.8.2 The steps of pouring hydraulic oil .

1. Open the cover of the hydraulic oil container, then pour the oil into the container until the level of the oil reaches the maximum level.
2. Start up the oil pump, after the machine repeats several simple acts, you can stop the machine. In this way, hydraulic system can convey the hydraulic oil to every part of the machine, and also release the gas in the hydraulic oil container out.
3. And then please check the oil ruler again, to see whether the oil level has reached the upper limit. If not, you can all some more.
4. After pouring the hydraulic oil and checking again, please put the cover back again in case of the entrance of other things.
5. When adding more hydraulic oil, please check whether the machine will leak or not.

4.9 Lubricating oil

This machine is equipped with an automatic lubrication device. In the PLC, you can set the time period and times of lubrication, which can ensure the smooth working of the machine. When you need to add more lubricating oil, please use a funnel and add to the lubricating oil to the HIGH. And also we recommend any one of the following lubricating oil brand.

Suppliers	Specifications
ESSO	Febis K68
HERCULES	Wayiube 68
MOBIL	Vactra Oil 2
SHELL	Tonna T68

Notes:

1. The above list is listed according to the order of the first letter.
2. Please don't mix the lubricating oil of different brand. If you want more details, you can contact the suppliers.

4.10 Plunger lubricating oil

This machine is equipped with a plunger lubrication device. A good work of the plunger lubrication can improve the working life of the plunger and plunger sleeve.

Lubricating oil for the plunger

Supplier	Specification
CHEMTREN	PL-47，PL-68
HOUGHTO	7176
PETROFER	GF7
MORESCO	NW11

Notes:

1. The above list is listed according to the order of the first letter.
2. Please don't mix the lubricating oil of different brand. If you want more details, you can contact the suppliers.

4.11 Greasing oil

You should add more greasing oil to the machine according to the distribution of the greasing oil nozzles on a regular base. And you should fill the greasing oil until the oil overflow in case of any damage caused by excessive workload.

Normal greasing oil

Supplier	Specification
CALTEX	Muitifak EP-1
ESSO	Beascon EP1
HERCULES	Sunny XL-EP 00
MOBIL	Mobilux EP1
SHELL	ALYANIN EP-1

Notes:

1. The above list is listed according to the order of the first letter.
2. Please don't mix the lubricating oil of different brand. If you want more details, you can contact the suppliers.

The greasing oil with Molybdenum disulfide

Supplier	Specification
CALTEX	Molytex EP-1
ESSO	Beascon Q2
JAEGER	Korniche Moly Paste
MOBIL	Mobilgrease HP 681 Special
SHELL	Retinax AM

Notes:

1. The above list is listed according to the order of the first letter.
2. Please don't mix the lubricating oil of different brand. If you want more details, you can contact the suppliers.

4.12 Accumulator

For the sake of the safety, the gas in the accumulator inside will be released during transit. Please fill the accumulator with gas before operating the machine.

Danger: only the nitrogen gas whose purity is above 99.99% is suitable for the accumulator.

Danger: Air or oxygen is forbidden, for they will cause explosion.

There are two patches of accumulators on the machine, both of which has different pressure. The pressure of intensify accumulator is lower than that of the fast shot accumulator.

Model	Fast shot accumulator	Intensify accumulator
ZL130	90~100bar	80~90bar
ZL160	90~100bar	80~90bar
ZL220	90~100bar	80~90bar
ZL300	90~100bar	80~90bar
ZL400	100~110 bar	90~100bar
ZL500	100~110 bar	90~100bar
ZL700	100~110 bar	90~100bar
ZL800	100~110 bar	90~100bar
ZL1350	100~110 bar	90~100bar
ZL1600	115~125 bar	100~110bar

The steps to add nitrogen to the accumulator

1. Please ensure that you have stopped the machine when you are adding nitrogen to the accumulator, and that the mouth of the connector is reliable. And the oil fluid inside the accumulator must be drained.
2. Unscrew the valve cover, connect the hose, open the release valve of the nitrogen bottle, adjust the opening of the valve, which can make the air enter into the bottle smoothly.
3. While filling nitrogen, you should check whether your hose or bottle will leak. If so, please stop filling nitrogen in case of any wastage. And then you should figure out the problem and find out the solution.

You can refer to the following method:

1) first, you can connect the nitrogen bottle with the accumulators, open the nitrogen bottle and accumulator valve, and then fill some nitrogen with the accumulator, within the pressure 20 ~ 30bar.

2) Next, please close the nitrogen bottle and accumulator valve. If you find leakage exists, please place soap bubble to accumulator cover, all connectors, hose connector, pressure gauge connector, to see whether those soap bubbles will expand or new bubbles will produce or not. The problem lies in the place where new bubbles will produce or bubbles will expand. Please repair those leaking places and refill nitrogen.

3) Fill the accumulator with nitrogen under the given pressure.

4) After filling nitrogen, please see whether the pressure gauge have some changes within 3 or 5 minutes. If not, your machine is ready for work. If yes, please check whether leakage exists, and then find out the solution.

4.13 Mold lubricating oil

Mold lubricating oil is used for the mold and plate, also it can be used to lower down the temperature of the mold, to help the product release, and to protect the shell of the product.

You can lubricate the mold manually or automatically. It is up to you.

The following is the common mold lubricating oil:

Supplier	Specifications
CHEMTREND	SL4000/5596
MORESCO	SE100
PETROFER	DIE-LUBRIC 622B

Notes:

1. The above list is listed according to the order of the first letter.
2. Different mold and products need different mold lubricating oil accordingly. If you want more details, you can contact the suppliers.
3. When using grease mold lubricating oil, please be careful of getting fired.

Chapter5 Operation

5.1 An introduction of control system

The control system of this machine is equipped with Siemens PLC, which simplifies the large and complex control system, makes smaller and takes up less space. It is easy to install wiring, reliable to operate, and hard to make failures, and flexible to adjust. In all, it can meet the requirements of the production of many products.

In the process of production, you can set, adjust or reset the machine through the man-machine interface(or 10 "touch screen), electric box, operation panel, and all kinds of valves or switches on the machine. In this chapter, we will provide a detailed description of the operation of the machine.

5.2 Categories of operators

Die casting machine is a typically hydraulic integrated machine with a complicated control system. Because of high temperature, fast speed, and high pressure, and other factors, die casting machine has many potential risks. Thus, operators should be highly qualified.

In general, there are the following categories of operators.

5.2.1 Operators' responsibility

Operator is responsible for the daily operation of machine through all control devices or valves on the machine in the normal working conditions. First, operators should fully be familiar with the position, function and methods of those control devices and with the characteristics of the machine. Secondly, before operating the machine, operators should go through this manual and know how to solve unexpected problems or stop the machine in time of emergency. Operators are not allowed to commission the machine, reset the parameters or troubleshoot without your boss's permission.

5.2.2 Routine maintenance operators

Those maintenance operators are generally dutiful for the regular maintenance of the machine, such as cleaning, safety check, adjustment, and so on. The routine maintenance operators should have basic mechanical and electrical knowledge, and possess the ability of troubleshooting.

5.2.3 Installer or troubleshooting staff

This kind of operators are professional in the installation, commissioning, operation and the maintenance of the machine. They should have relevant professional qualifications, and have the ability to take precautionary or necessary measures to prevent or solve some problems.

5.2.4 Programmers

Programmers are engaged in process programming, parameter setting and all other preparations of machine. Programmers should fully understand the consequence of his parameter setting for the machine, and at the same time, they are not allowed to troubleshoot with relevant permission.

All those responsible for machine operation, maintenance should read this manual and acquire relevant technical information. Any damage to the machine or the health of the operators caused by unqualified operators' improper operation should be born by the buyers yourselves.

We strongly suggest that operators should begin to work after some job training.

5.3 Operation panel

Operation panel is used to trigger each manual action. Most of the function of the machine is realized by the "start", "stop" "open", "off" buttons. The operation panel can be divided into two parts, namely the main part and the peripheral equipment parts.

No	Name	Status	Function
1	Shot button	Reset	No function
		Press	When Automatic or Smi-auto, if die clamping is in position and shot is ready, the signal light will be on. Also the plunger will be ready to shot.
2	Shot ready Signal light	On	Die lock is not in position, not ready to shot
		Off	Die lock is in position, plunger is ready to shot
3	Die open	Reset	No function
		Press	When manually, die open and stop at the proximisty switch
4	Core 1	In	Manual mode, core 1 go forward motion to forward limit limit switch stop
		Out	Manual mode, core 1 go forward motion to the backward limit limit switch stop
		Middle	No function
5	Core 2	In	Manual mode, core 2 go forward motion to forward limit limit switch stop
		Out	Manual mode, core 2 go forward motion to backward limit limit switch stop

		Middle	No function
6	Core3	In	Manual mode, core 3 go forward motion to core 1 forward limit limit switch stop
		Out	Manual mode, core 3 go forward motion to core 1 backward limit limit switch stop
		Middle	No function
7	Core4	In	Manual mode, core 4 go forward motion to core 1 forward limit limit switch stop
		Out	Manual code, core 4 go forward motion to core 1 backward limit switch stop
		Middle	No function
8	Plunger forward/backward rotate switch	forward	In manual mode, plunger go forward
		backward	In manual mode, plunger go backward
		middle	No function
9	Ejection forward/backward switch	forward	In manual mode, ejection go forward motion to limit switch stop
		backward	In manual mode, ejection go backward motion to limit switch stop
		middle	No function
10	Manual/semi-auto/auto option	manual	Manual operation mode
		auto	Auto cycle state（continous cycle state）
		Semi-auto	Semi-auto (one cycle state)
11	Open/close mould speed switch	Slow speed	Slow speed open/close mould
		Fast speed	Common speed open/close mould
12	Second fast speed option	ON	In auto mode, have second fast speed injection
		OFF	In auto mode,haven’t second fast speed injectio
13	Die height	Reset	No function
		press	In manual mode, adjustable mould option switch under

			ON position, can adjustable to mould thickness direction
14	Adjustable mould button	ON	In manual mode, allow adjustable mould
		OFF	Not allow ajustable mould
15	Mould thin	Reset	No function
		press	In manual mode, adjust mould option switch under ON position, can adjustable mould thin direction
16	Switch button(customer optional device)	Reset	No function
		press	safety door open/ close action
17	Close door button(customer optional device)	Reset	No function
		press	Safety door close action
18	Oil pump start up button	Reset	No function
		Start up	In manual mode, oil pump motor doingY-△ start up, indicator light ON after start up， Oil pump start up finish
19	Oil pump stop	Reset	No function
		Press	When the pump is working, if you press this button, you will cut off its power supply, and the pump will stop working.
20	Plunger lubrication button	Reset	No function
		press	In the manual manner, the plunger will lubricate itself
21	Die lock button	Reset	Can not work
		press	In the manual manner, and the conditions are permitted,please press both of the die lock button at the same time. In the automatic manner, when the conditions are permitted, the machine can trigger itself.
22	Power supply Signal light	Turn right	Means the control part is electrified, and the power supply signal light will be on. That means the machine can work.
		Turn left	Means the power supply for the control part is cut off. And the power supply signal light will be off. And the machine can not work.
23	Emergency stop	reset	The motor is ready to work.
		press	You is not allowed to perform the machine.

5.4 Control electric box

The main control electric box is used to set the casting parameter, thus to control the machine. The following chart is going to give details to the components and the functions of the main control electric box.

no	Name	Function
1	Interface 12″	It will show the working status of machine. And you can input control parameters and get data from it.
2	Working pressure Current gauge	Reveal the system working pressure and current.
3	Working flow	Reveal system working flow and current
4	Power supply signal light	If the light is on, it means the controller is well electrified.
5	Emergency stop	If you press this button, the machine will stop suddenly, and the pump will stop working, too.
6	Emergency stop signal	If you press the emergency stop button, the signal light will be on.
7	Door lock switch	This switch is used to control the safety door. The key of the lock should be kept by technicians. The door lock switch can be on, and you can open the door when the machine is clamping. This is general used during machine commissioning.
8	Handle	“ON”means the machine is electrified, and“OFF”means the power supply is cut off.

5.5 Control switch and hydraulic valves

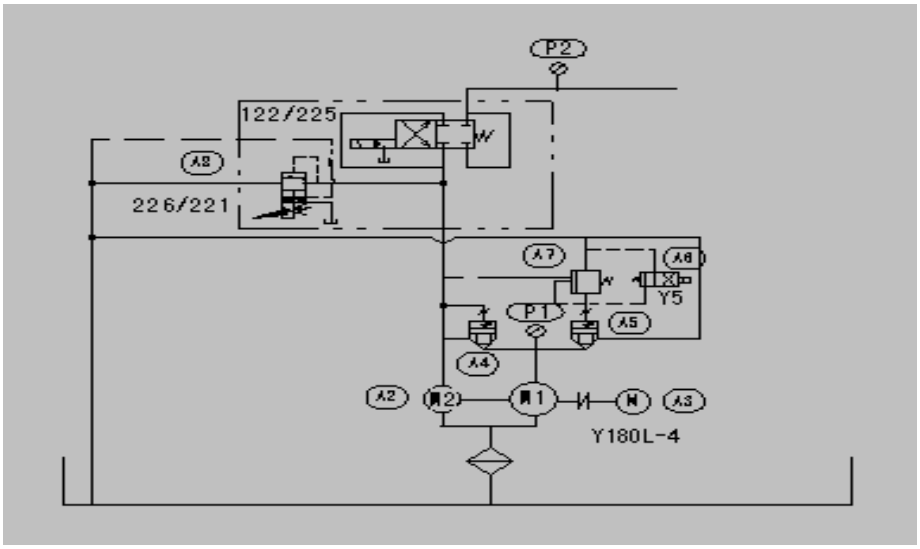
Operator needs to adjust or reset those control components to help the machine acquire good performance. But for some part of the machine, operators can reset parameters on the touch screen to control them.

5.5.1 The position of the die lock stroke and speed control

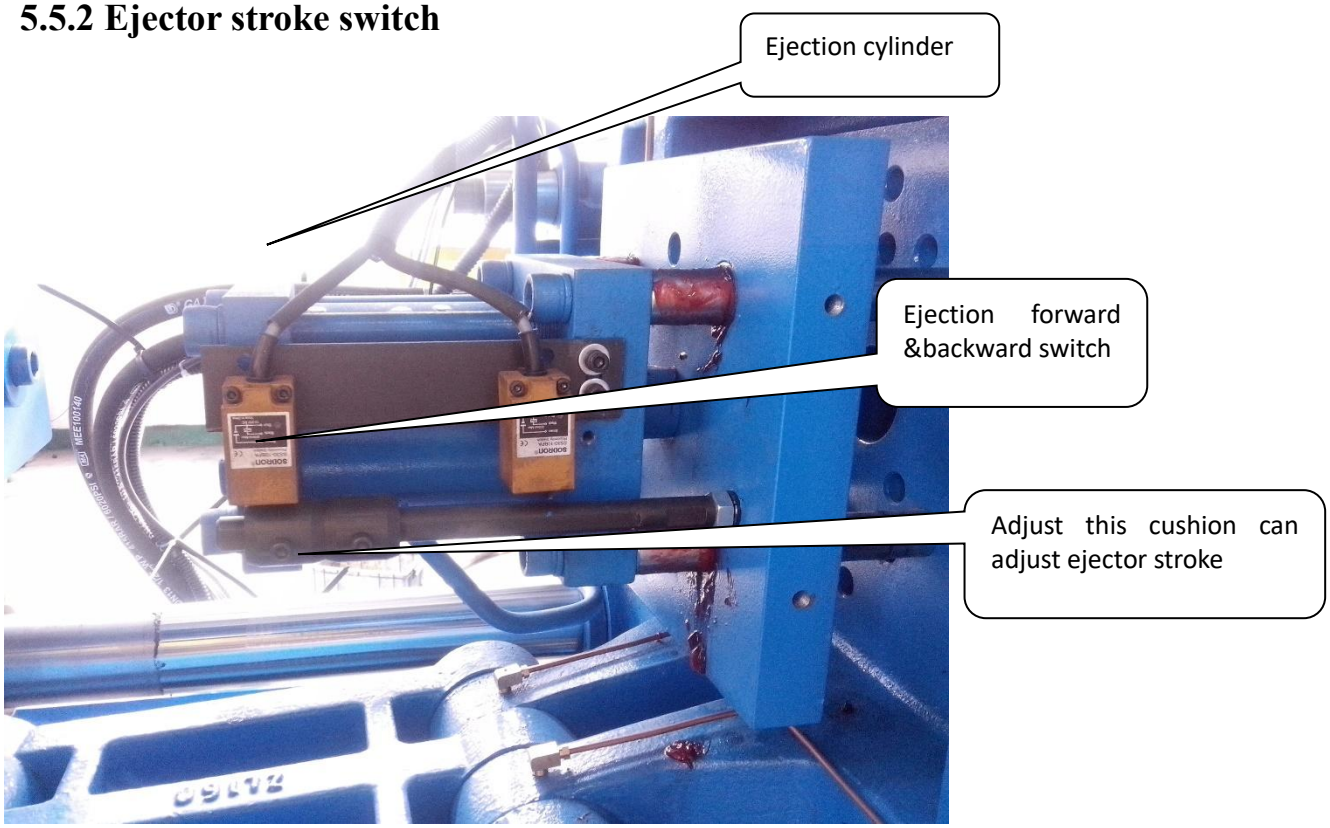
Different position of the die lock stroke needs different pressure. The die lock electric ruler controls the die lock: die open terminal---high speed clamping--low pressure clamping--high pressure--the end.

Die open: die clamping end--high pressure die open--high speed--slow speed--die open terminal.

Die open stroke is controlled by the electric ruler, and its control pressure and flow can be set by the main controller. And the ruler can show the precise position of the middle board. In this case, there is no need of the limit switch. The support rod inside the machine hinge is equipped with limit switches. Before delivery, everything is set well. So, you don't need to adjust.



5.5.2 Ejector stroke switch



Ejection stroke can be controlled by the limit switch, which can be adjusted by two bear flanges.

5.5.3Shot stroke control

Shot stroke is controlled by limit switch (optional non-contact encoder), so that the injection process will be stepless regulation on the touch screen, the confirmation of the return plunger

can be detected by the limit switch.

5.5.4 Shot speed control

5.5.4.1Slow speed shot control

The slow injection is realized by the directional valve V404, and its speed can be adjusted by the line flow proportional valve. Or you can set different valve for the flow on the touch screen, so you also can adjust the injection speed.

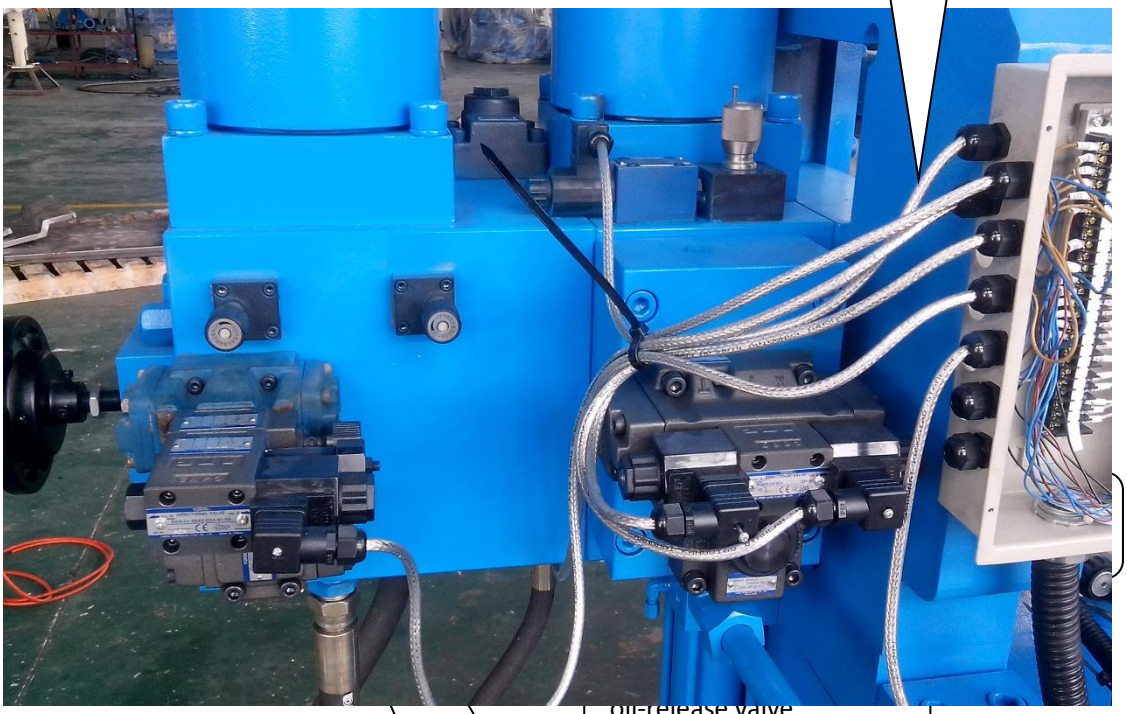
5.5.4.2 First high speed shot control

This machine has the function of first high speed shot control which can be adjusted by the high speed valve JVI. This valve is under high speed accumulator. You can switch the nut of the valve to adjust. This function is good for the injection part and the plunger tracking. This machine adopt electric adjustable valve operation on touch screen, setting open size can control first fast injection speed.

5.5.4.3Second high speed shot control

The second high speed shot valve is on the high speed accumulator. When the speed of injection becomes higher, energize valve Y15 and open valve JV2. When the pressure oil in the accumulator enters into injection cylinder with high speed, the machine will injection at high speed. The speed of injection can be adjusted by the hand wheel. This machine adopt electric adjustable valve operation on touch screen, setting open size can control second fast injection speed.

JV3 hand wheel
Adjust the speed of intensify

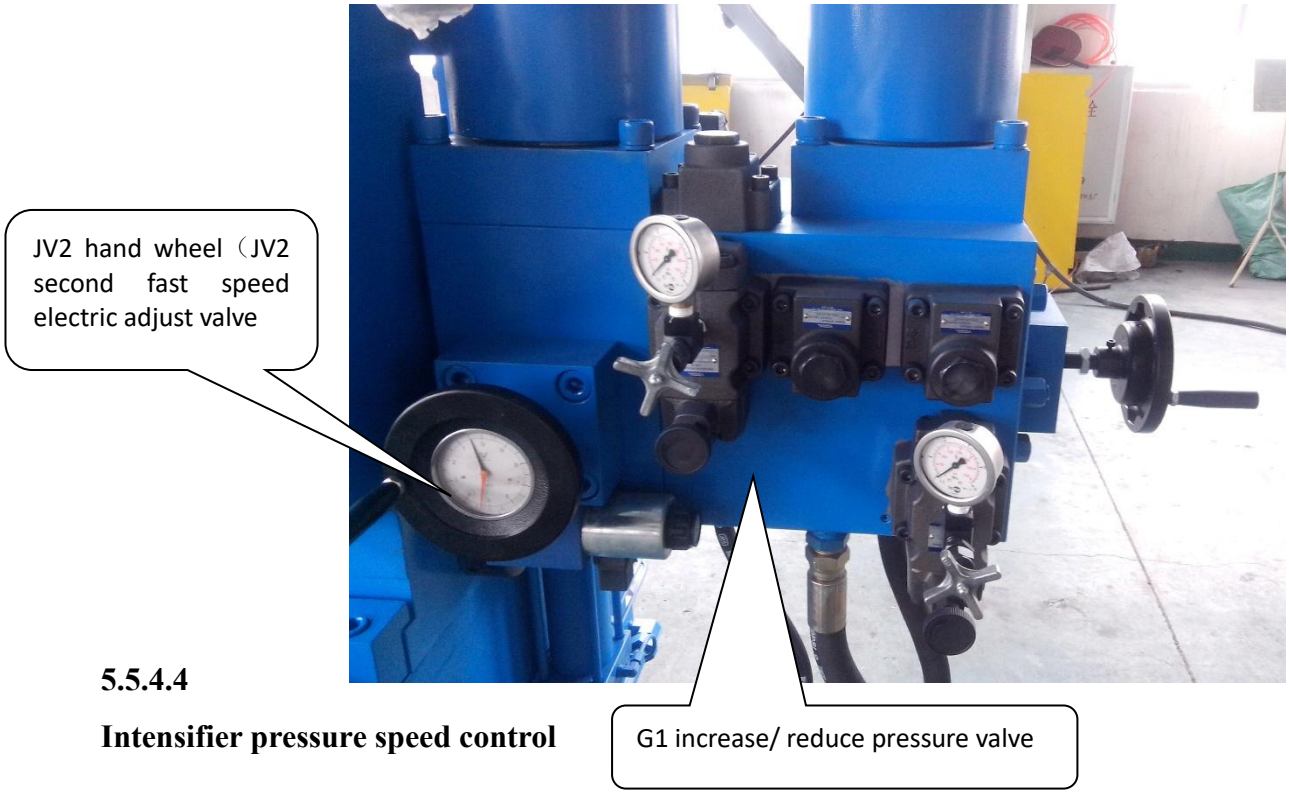


oil-release valve

F8 intensify accumulator oil-release valve

Y15econd fast speed solenoid valve

F1 injection reduce pressure valve



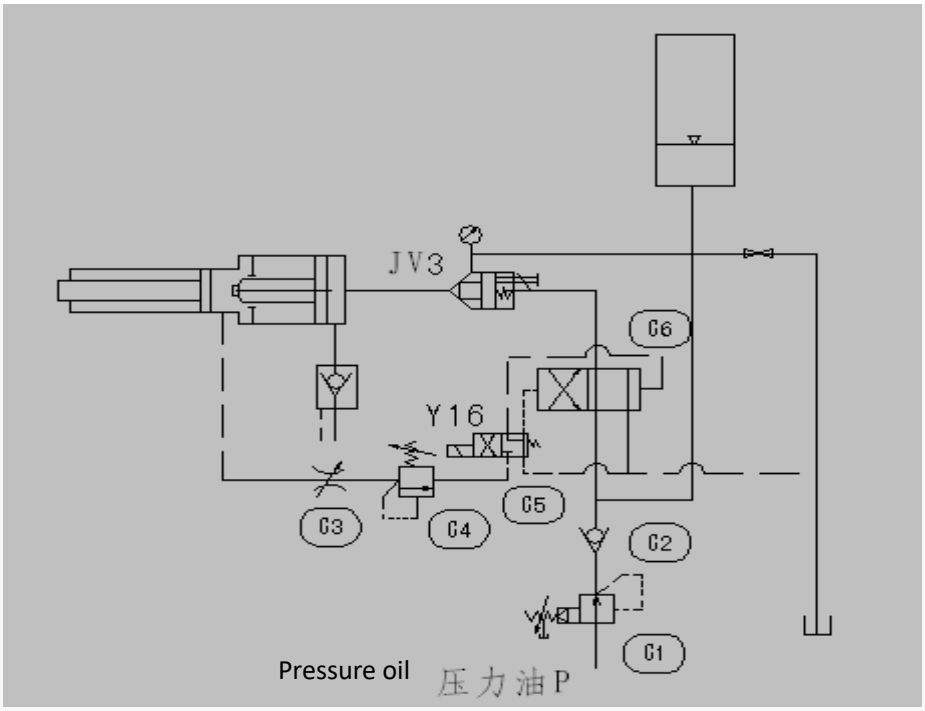
5.5.4.4

Intensifier pressure speed control

a. Injection commissioning

Machine minimum injection force of injection cylinder area multiplied by the injection pressure of accumulator, no pressure at this time. Increase injection force available pressure cylinder, the size of the boost pressure is determined by the pressure accumulator work pressure. The pressure with G1 to adjust the relief valve. Adjust the pressure reducing valve G1, change the pressure accumulator oil pressure to the size of the setting pressure increasing, the pressure value can observe from the table, when adjusting the amplitude is larger, adapted to fit the turbo charge pressure of air cylinder, the base inflation pressure shall be the oil filled pressure accumulator pressure (pressure reducing valve outlet pressure of the G1) after 80-85%, the pressure from the observation on the pressure gauge

A. increases the pressure of debugging



1, adjustment of pressurization starting time

Pressurization G6 start valve open time is controlled by the stacked sequence cut G4:

G6 pressurization starting valve is used to control the pressurization JV3 handwheel opening, by adjusting the control pressurization G6 start valve open time is to adjust the pressurization starting time.

Stacking sequence cut G4 pressure oil cavity after injection cylinder. Booster after two quick start, start the electro-hydraulic valve on the G6 Y16 by the coil in the G5 electromagnetic logging, electric, circuit connected at this time, but the pressurization laval G6 did not start, only after the injection cylinder cavity oil pressure rises to a certain value, which meet a stacking sequence cut G4 setting pressure (pressure is small, pressurization starting early, high pressure, pressurization starting late), the supercharged start valve and shot at the end of the cylinder cavity after oil through, oil pressure forces acting on the valve core began to push the reversing valve core, supercharged start valve G6 start, pressurization JV3 handwheel through the control of oil return, so supercharged JV3 handwheel open, pressure accumulator to pressure cylinder oil, start charging. According to the principle of the above actions, regulate the stacking sequence cut G4 pressure adjustable pressure start time

B.Boost startup speed adjustment

Boost startup speed is adjusted by the throttle to control the G3

After the injection cylinder chamber oil pressure booster starts communicating throttle valve G3 G6, G3 visible adjust the opening size of the throttle valve can be adjusted the moving speed of the spool, so as to achieve the purpose of adjusting the start speed.

1, the supercharger speed adjustment

Supercharger speed is controlled by adjusting the hand wheel booster valve JV3

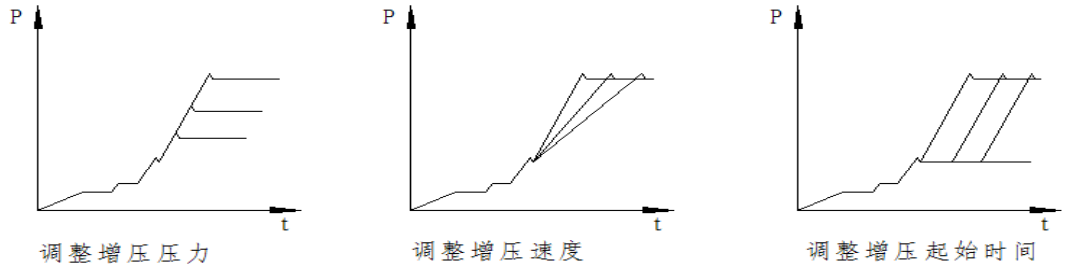
After the booster starts, boost speed that is the sleeve after the chamber pressure rise rate depends on the speed of movement of the piston is pressurized. Supercharger speed control, which is achieved by adjusting the hand wheel control valve opening JV3 the booster. JV3 is pressurized cartridge valve, mounted on the tail hit the feeding device. The size of the supercharger speed is controlled by adjusting the hand wheel cartridge valves

on hand rotary hand wheel, available in different speeds. Screw the plunger can control the pressurized portion of the tail end of the hand wheel speed (JV3), clockwise, booster valve flow becomes smaller, supercharged slow. Conversely faster. Supercharging pressure change depends increase the hydraulic pressure accumulator.

2, increasing the pressure regulator

Regulating valve G1, change supercharger hydraulic accumulator to adjust the size set by the pressure, the pressure value can be observed in Table 41, when adjusting the amplitude is large, pressurized cylinder inflation pressure shall be adjusted accordingly, its underlying inflation pressure should be pressurized accumulator after oil-filled pressure (ie pressure relief valve outlet G1) is 80-85%, the pressure on the pressure gauge when viewed from P6.

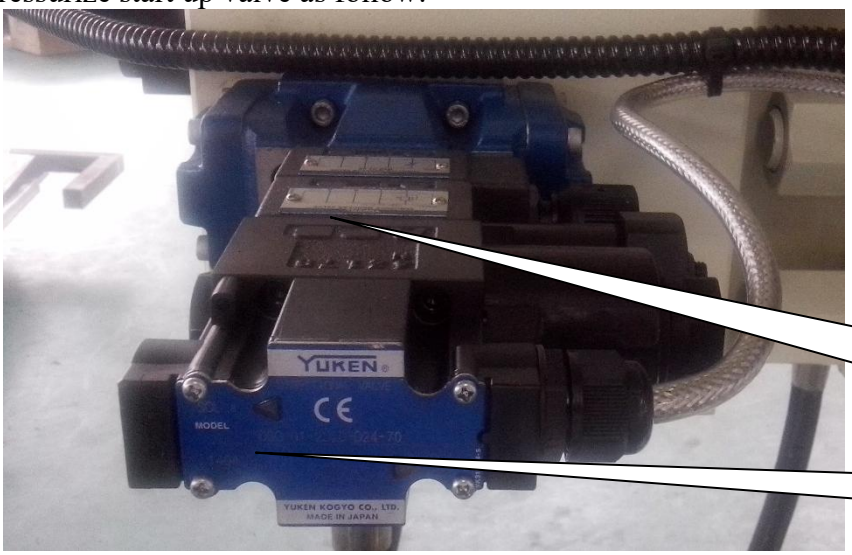
Pressurization start time, boost speed, increasing the pressure regulator as shown below:



Adjust pressurize pressure　　Adjust pressurize speed　　Adjust pressurize start up time

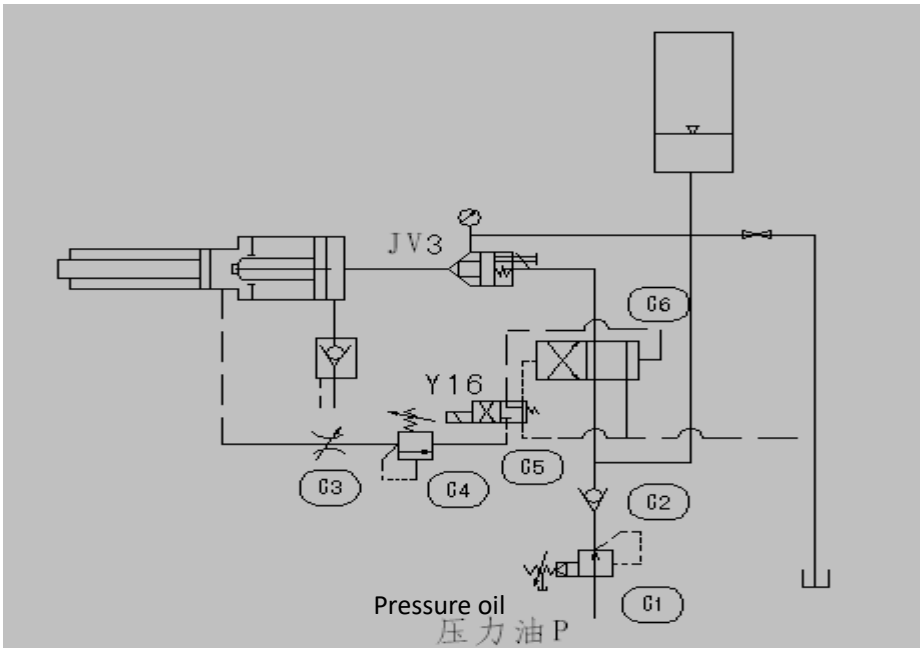
Note: when debugging parameters grew gradually turn up, can not be transferred at maximum.

Pressurize start up valve as follow:



G4 sequence valve,adjust &control pressurize start up time

G5 pressurize solenoid valve



5.5.4.5 High speed and intensifier pressure accumulator pressure control

Y18 Quick discharge solenoid valve

JV4 plug-in components

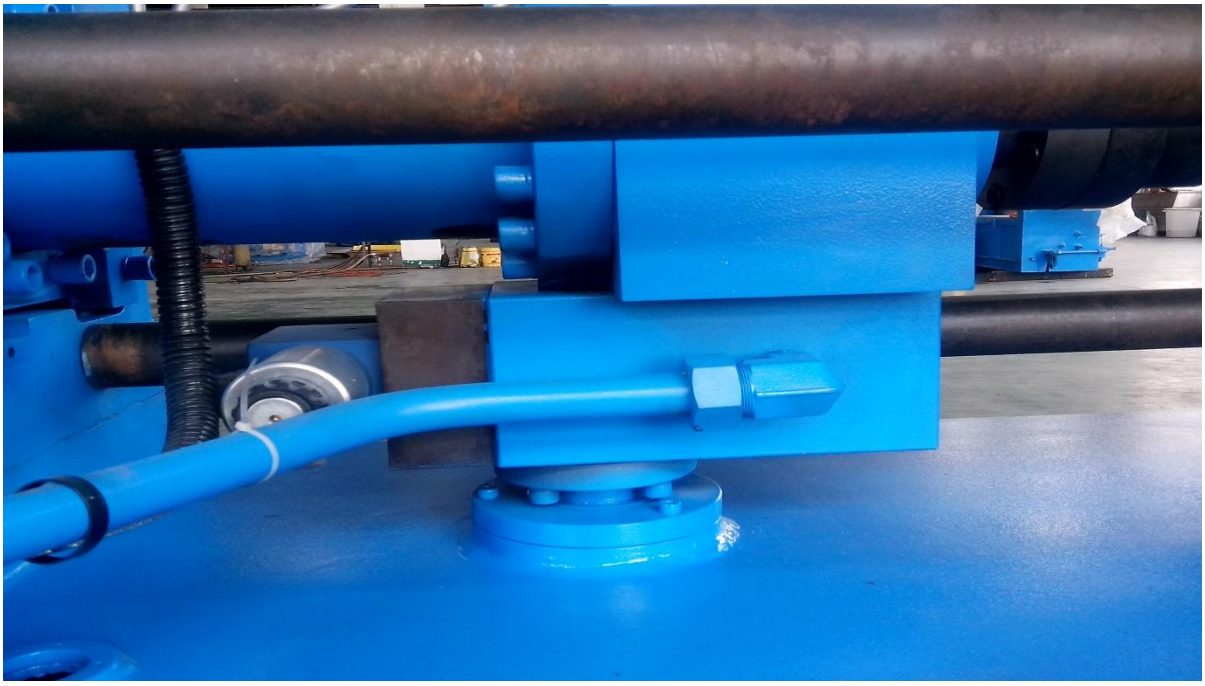
The second high speed and intensifier pressure depends on the pressure of th
but you can adjust the second high speed and intensifier pressure.

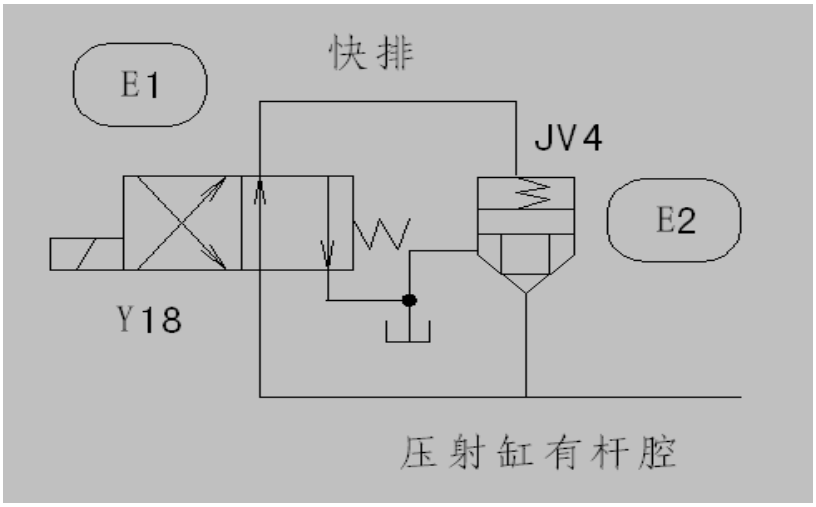
Under second high speed accumulator is the reduce pressure ve V20. I
valve in the clockwise way, the pressure will become sm er and if in pp
pressure will be bigger.

Under the intensifier pressure accumulator i the intensifier valve V19 . If you turn it in the clockwise way, the pressure will become bigger, and if in the opposite way, it will become smaller.

5.5.4.6 High speed drain oil valve

When injecting, please open this valve, to drain oil; when the plunger is back, please close it





Injection cylinder rod cavity

5.6 machine body control box

In the part of the injection and die clamping separately, there is a secondary control box. The appearance and position of the control box will be different from machine to machine. And each control box will be equipped with buttons and dials.

Build-up-pressure button and dials: means starting up the line pressure and begin to store up energy. The pressure gauge will show the current line pressure and accumulator pressure gauge will show the current accumulator pressure.

Emergency button: when it is urgent and something unexpected happens, you can press this button. But if everything is normal, please don't press this button but should stop the pump to stop the machine. When the emergency button is pressed, the following will happen:

A. pump stops working;

B. Controller and all hydraulic act signal is cut off;

C.High speed and intensifier accumulators will reduce pressure

D. Emergency alarm;

Line pressure button: when this button is pressed, the high speed and intensifier accumulators will begin to store energy.

5.7 The adjustment of the injection position

5.8.1 After starting up the main pump, please change the operation mode into manual.

5.8.2Please dismantle the plunger and piston rod from the injection parts.

5.8.3And then loosen the screws on the both sides of the lead rails until the spring washers release, but not to remove the screws.

5.8.4Prepare the lifting pad appropriate to the injection unit.

5.8.5Next, press " line pressure" and adjust the " up and down" switch to rise the injection units.

5.8.6When the shot part is lifted, you need to change the lifting pad for the plunger and piston rod. When exchange, please take care to protect everything.

5.8.7And then switch the "up and down switch" to down; then lift jack low down to the lifting pad.

5.8.8Tighten the screws on the both sides of the lead rail.

5.8.9Replace head plate orifice.(some can be rotated 180 degree to accommodate the shot position.)

Chapter 6 Control system

6.1 An introduction of the control system

This series of die casting machines uses Siemens controllers and color touch screens. Through simple screen operation, the pressure and working flow of various actions of the machine can be set by adopting the mode of man-machine dialogue, which simplifies the complicated control system and has the extended function.

6.2 The instruction of the touch screen

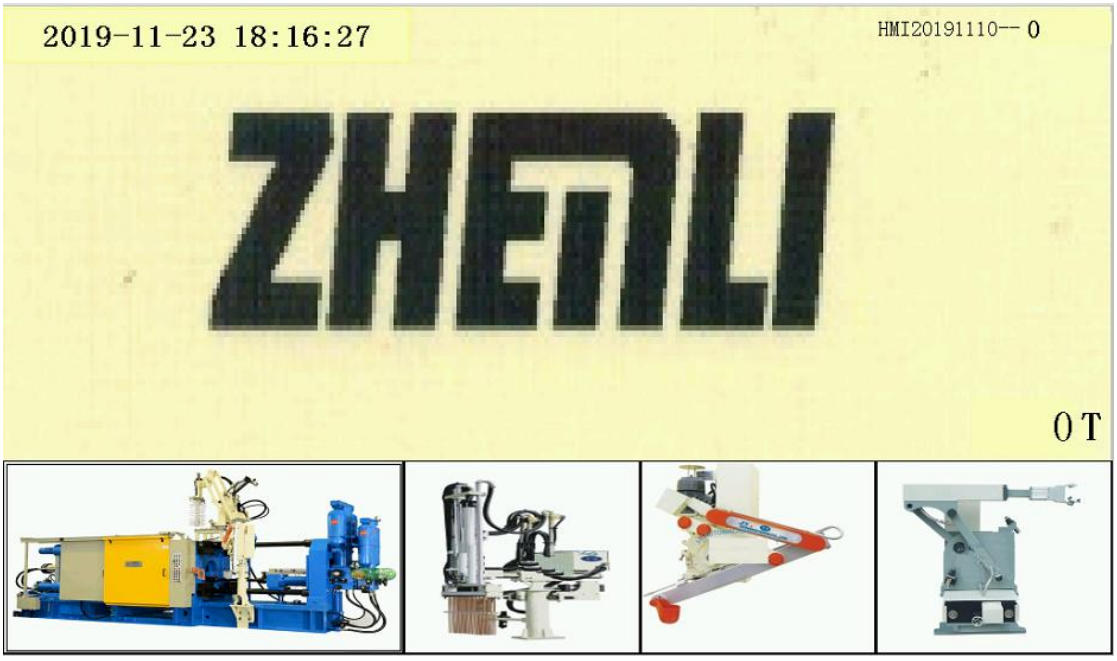
The display adopts touch mode to start and input. It only needs to touch the display lightly with your finger. The vibration control system is relatively intuitive. You can enter the corresponding interface by touching the corresponding screen (such as the die casting machine screen), that is, you can operate, input, etc. .

Never use a hard object such as a screwdriver to strike the display to avoid damage. Please press the touch screen after confirming the security of the system.

Pressing the touch screen quickly and continuously may result in the inability to read the input. After confirming that one input is complete, proceed to the next input operation.

If you touch the screen of the “die casting machine” on the screen, the screen immediately enters the “die casting machine” interface. Similarly, if you touch the screen of “Give the ladle machine” on the screen, the screen will immediately enter the “To the ladle machine” interface.

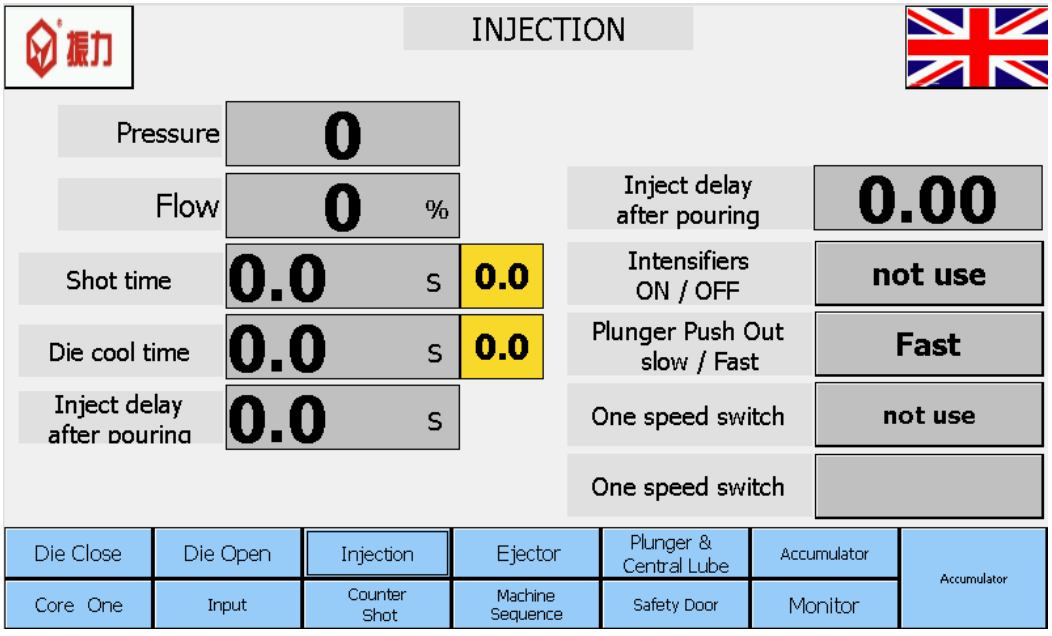
6.3 The front page of the touch screen



After the display is powered up, the system self-test is first performed, and the above screen is automatically popped up after error-free. This screen is mainly used to display basic machine data and parameter information. Touch the corresponding function button at the bottom of the screen to enter the pair.

The function setting screen should be. Each function screen, such as shot, thimble, core pull, etc., is divided into a parameter setting area and a status display area. Parameter setting area can be used to set and modify parameters. The status display area is used to display the status information of each input and output point of the machine.

6.4 The injection screen



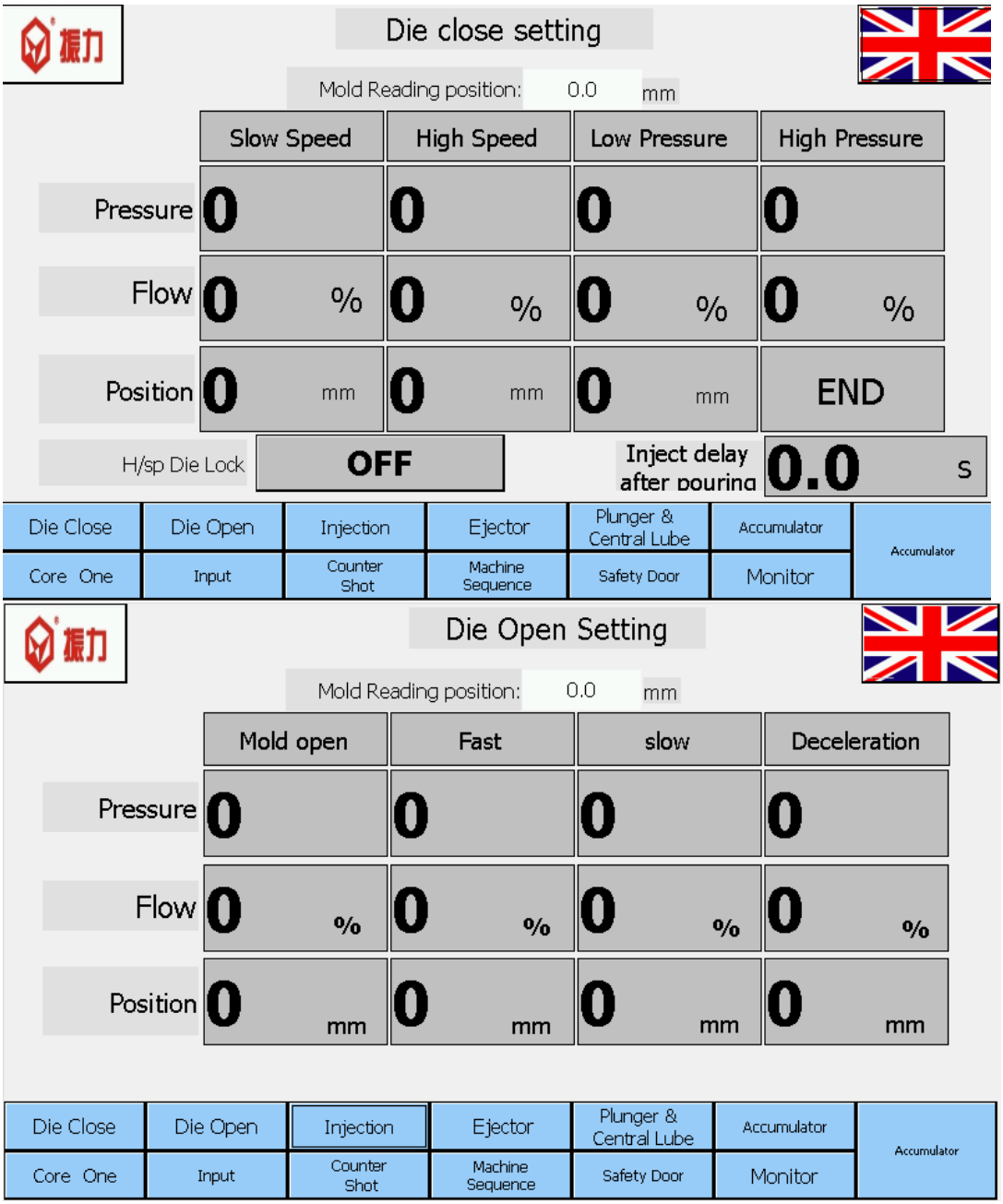
In the picture, the blue frame is the parameter setting area, and the black is the display area.

There are two ways to select the injection position, one is the proximity switch and the other is the magnetic scale. Select the magnetic scale when adjusting the injection position parameter on the screen. When adjusting the injection position of the proximity switch on the die casting machine, select the proximity switch to be effective (optional model)
A quick choice: select items when you need to increase the slow injection speed. Valid in the automatic state. At the same time, you can set a quick start position.
Boost selection: An option is required when there is a boost shot. It is valid in the automatic state, and can also set the boost trigger position to start the boosting action, the unit is “mm”.
Boost trigger mode: In the automatic state of the boosting action, you can choose to use the position control boost, or you can choose to use the pressure to control the boost. When using the pressure control boost, you can set the boost pressure.
Boost delay: When the shot is shot to the second fast stroke, the boost is triggered after a certain delay.

Cooling time: The delay from the end of the injection to the start of the mold opening. Valid in automatic state. Boost Delay: Used to set the delay after the boost trigger. After the boost condition is reached, the timing starts, and the delay time is up to start the boost. Start-up energy storage option: When selecting, each time the oil pump is turned on, the system automatically performs the energy storage action first. You can choose to set the energy storage time. Mode-locked energy storage time: When the mode-locking is in place, the energy storage time setting value of the energy storage device is valid when the energy storage control mode is selected as “time”. Back hammer energy storage time: When the hammer is in place, the energy storage time setting value of the energy storage device.

6.5 die lock screen

The clamping process is divided into four sections: slow speed, fast, low pressure, and high pressure. Each segment corresponds to different pressures and speeds. The pressure and speed of the four sections can be adjusted according to the site conditions. The slow start position is the position of the electronic ruler when the mold is in place; the quick start position setting value must be between the slow start position set value and the low pressure start position set value; the low start position setting The value must be between the fast start position set point and the high pressure start position set point; the high pressure start position set point must be between the low pressure start position set point and zero.
The mold opening process is divided into four sections, each section corresponding to different pressures and speeds. The pressure and speed of the four sections can be adjusted according to the site conditions. Low-voltage protection time: The value of the low-voltage clamping time can be set. Slow mode-locked flow: You can set the value of slow mode-locked flow. Slow mold opening flow: You can set the value of slow mold opening flow.
Lock open mold current position: display the current template position



6.6 Mold adjustment screen

This screen is mainly used to mold parameter. If you touch the key, say auto mold adjustment, manual mold adjustment , or help, you can have the access to set parameters for each function.

Manual mold adjustment: there is mold adjustment selection button on the machine. When you install the mold, please press the mold adjustment button.

Note: when adjusting the mold, you can set the pressure and flow for die lock and die open, but their setting valve cant be too big. And when the die is going to be close, please choose the mode of manual mold adjustment to ensure the plates will not clamp each other. And after adjustment and everything comes to normal, you can choose the automatic mode.

Mold adjustment thin pressure: means to set the thin pressure for low speed mold adjustment.

Mold adjustment thin flow: means to set the thin flow for low speed mold adjustment.

Mold adjustment thick pressure: means to set the thick pressure for low speed mold adjustment.

Mold adjustment thick flow: means to set the thick flow for low speed mold adjustment.

Automatic mold adjustment screen

Locking force target valve setting: if your machine is equipped with

Automatic transfer mode screen

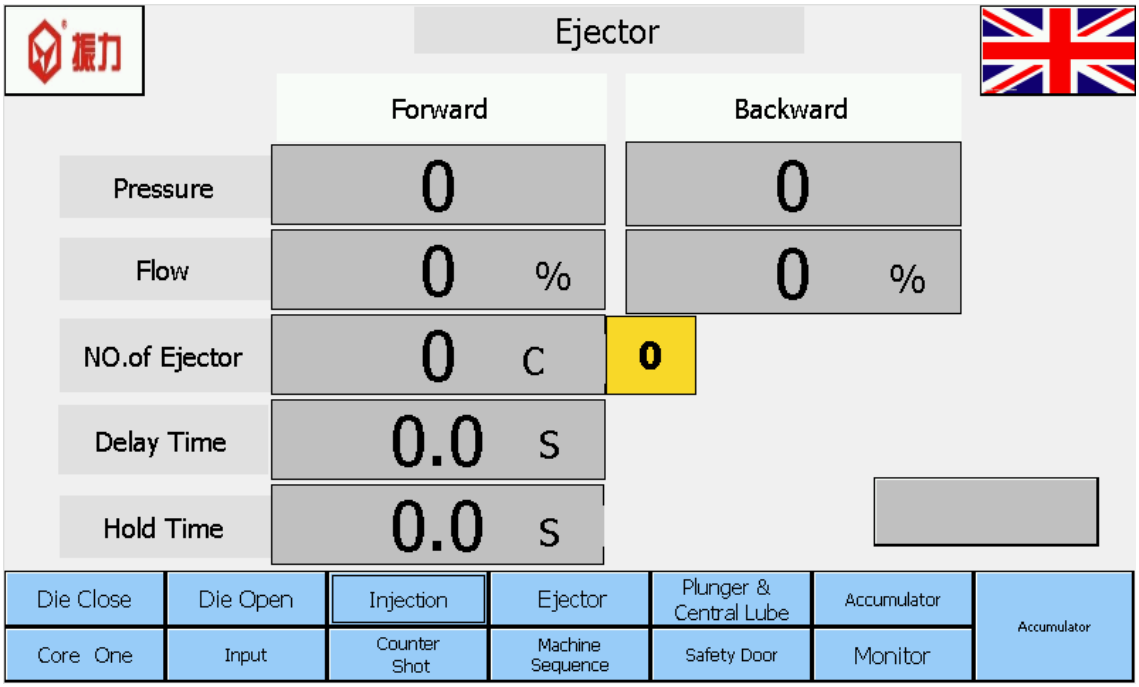
Clamping force target setting: when the machine is equipped with a clamping force checking means for setting a target value of clamping force.

Auto mode selection: When the machine is equipped with a clamping force detection device, the options to be useful. If set to select, you must set the target clamping force.

Auto-start mode: automatic adjustment mode and auto mode selection knob to select both, and then press the button die thick thin mold, auto mold starts. The system will clamping force detected value is compared with the set value, thus automatically adjusts the mold thickness.

Transfer mode help screen and operating conditions

6.7 ejector picture



Thimble times: set forth the number of automatic thimble.

Thimble forward pressure: set system pressure thimble forward.

Thimble forward speed: set speed thimble forward.

Thimble ago Delay: set the delay thimble forward. It was the first time delay before the start of the thimble forward.

Thimble back pressure: Set thimble backward speed.

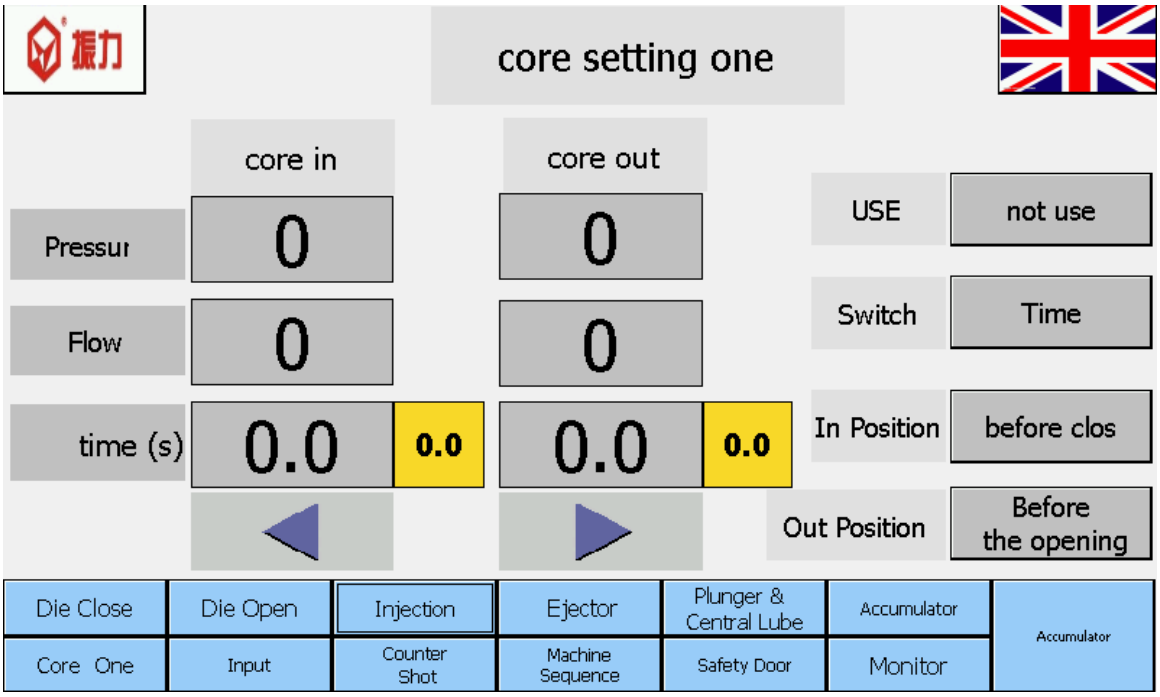
Thimble backward speed: Set thimble backward speed.

Thimble Delay: Set delay thimble backward. It is the last delay before the start of the thimble back.

Former thimble limit: When you select electronic device control, can top front end position (ie thimble stroke), can be set. Thimble thimble to advance to the front limit position, stop.

By thimble screen, you can enter the operating conditions thimble picture thimble and thimble status screen Help screen

6.8 core pulling screen



Pulling interface Function:

Pulling Control: Limit switch control and time control

Pulling into the pressure: Pulling people set pressure value.

Pulling into traffic: a set percentage Pulling into traffic.

Pulling out the pressure: Pulling out the set pressure value.

Pulling out of traffic: the percentage set suction flow.

When selecting the limit switch control, core pulling out of place confirmed by the limit switches.

When you select the time control, the picture in the "Pulling people time" and "Pulling out of Time" setting is valid.

Pulling in time: Pulling into action triggered, start time, the time that it indicates Pulling into place; Pulling out time: Pulling out when the action is triggered, start time, the time that it indicates Pulling out place.

Select the time when A. Pulling, you need to install the limit switch, simply select the time of Pulling manner on the screen, and set the appropriate time and Pulling Pulling people out of time.

Select the time when B. Pulling, walking automatically before, first you must manually Pulling out of place.

C. Other actions and Kyrgyzstan made the same settings Pulling

(1) Pulling That time limit switches with time instead of time, that is after the time set Pulling, Pulling into place; Similarly, after setting Pulling back the time, core pulling back

into place

(2) Select time Pulling, must first manually Pulling out of place.

Pulling spray features: Product ejection is completed, and thimble back into place after the spray function select Pulling, Pulling Pulling operation carried out and start time, when time after spraying Pulling Pulling out of order according to the set according to the setting operation .

Manually core sequence is invalid: When selected, in an open mold in place state of the mandrel can be no sequence of actions.

Pulling into the delay: The delay before automatic pumping core operation, to avoid machine vibration.

Pulling out delay: The delay before automatic pumping core operation, to avoid machine vibration.

6.9 peripherals (optional)

To the soup choices: choose or not choose

Standby options: to the soup selection standby, waiting for the soup to feed the signal in the furnace exit, until the radio signal is received inverted soup starts operation; to the soup is not selected after standby, complete soup to the soup Drain After waiting at the exit side of the feed material pot signal until receiving the signal emitted material, pour soup starts operation.

Standby time on the stove: to drain the soup after the soup is completed, the furnace into the waiting room.

Oven Standby time: When exposed to noodles to the soup, the waiting time in the furnace.

NOTE Tom Delay shoot material time. NOTE soup to soup machine operation is completed, injection plunger soup delay time after, to die-casting machine plunger signal.

Take soup metering timer: after taking the soup to the soup at the furnace waiting time, how much to adjust the amount of soup.

High-speed NOTE soup time: High-speed NOTE NOTE soup soup time.

Rise time after taking soup: Take soup timing arrives, spoon rise, this rise time setting. When the noodles detecting electrode rod leaving molten metal, the timer starts counting, timing Road Act, stopped rising.

NOTE soup time low: Note soup spoon, a low speed - high speed speed conversion, initially low, the operating time of the timer is set thereby.

Standby time ago: after taking soup, cross went forward after rising position NOTE soup, waiting for completion of preparation emitted signal, as the signal exceeds the set waiting time again and get back soup. This timer is set, is to prevent the molten metal spoon inside temperature is too low, resulting in changes in the amount of soup, make the appropriate settings.

Standby time: after taking soup, rise limit stop, start timing. Increased limit on the stove off waiting for the signal type, such as exceeding the set waiting time, the decline once again to take the soup. When the oven is set to the side, this timer will be action. At this time when the timer is set to take the child to prevent the molten metal within the temperature is too low, resulting in changes in the amount of soup, make the appropriate settings.

Arm spoon while back: setting, after the completion of injection soup, soup spoon retrieval limit while the arm back.

To the soup arm speed settings: You can set the arm speed / low-speed forward and backward through speed interface;

To the soup spoon speed setting: Set to take soup spoon / NOTE soup speed.

6.10 Auxiliary picture

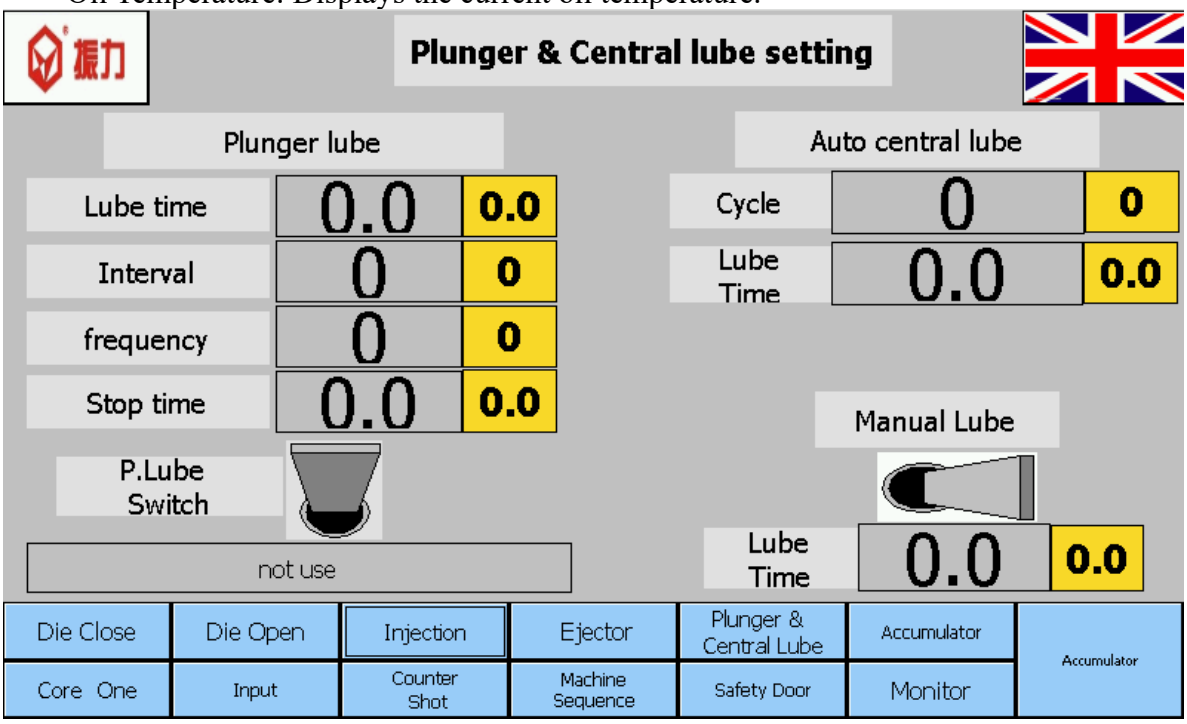
Oil temperature alarm settings

When the oil temperature alarm is set to choose, the alarm can be set upper and lower limits.

Oil temperature alarm limit: Setting the upper oil hydraulic oil warning, to limit the warning alarm, such as cooling pumps closed, will open.

Oil temperature alarm limit: Setting the hydraulic oil warning limit oil temperature reaches the lower limit warning alarm and shutdown cooling pump.

Oil Temperature: Displays the current oil temperature.



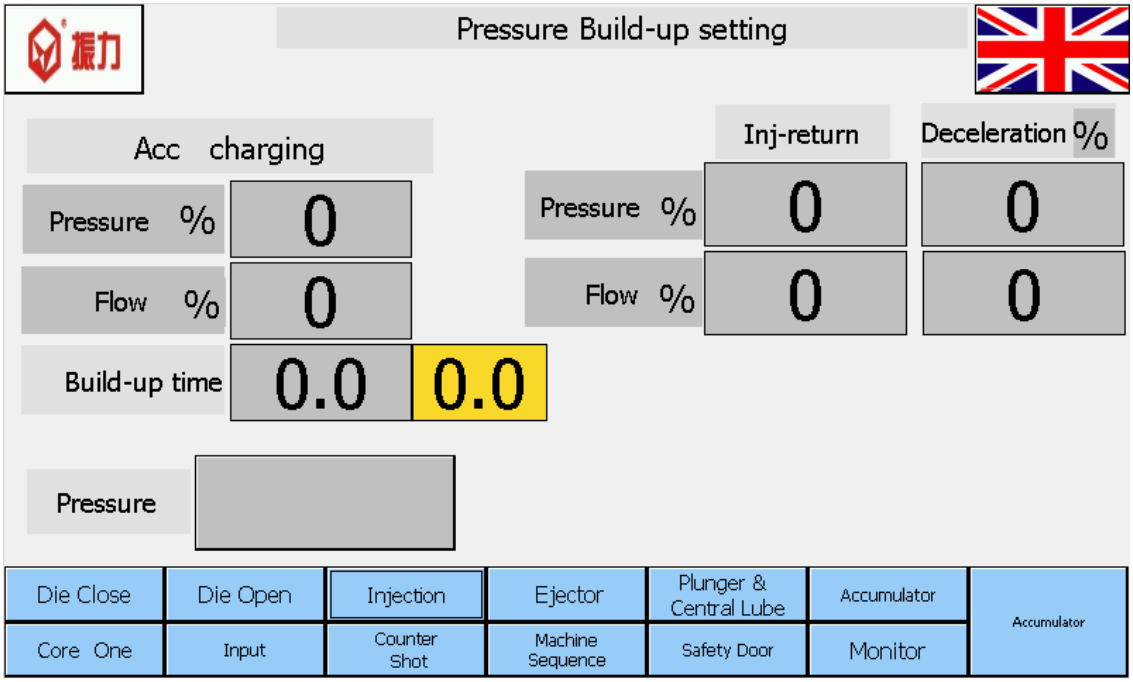
Machine hinge Lubrication Time: Time is lubricating machine lubrication hinge beginning to the end of the set time.

Machine hinge lubrication intervals molding times: machine hinge lubrication interval setting value. The data is the number-lock mode, when the number of lock mold machine reaches the set value starts to lubricate hinges.

Hammer lubrication intervals: injection frequency reaches the set value, beginning hammer lubrication.

Hammer lubrication frequency: hammer lubrication Dayou times.

Hammer lubrication time: lubrication frequency delay time. Usually set to 0.6 seconds.

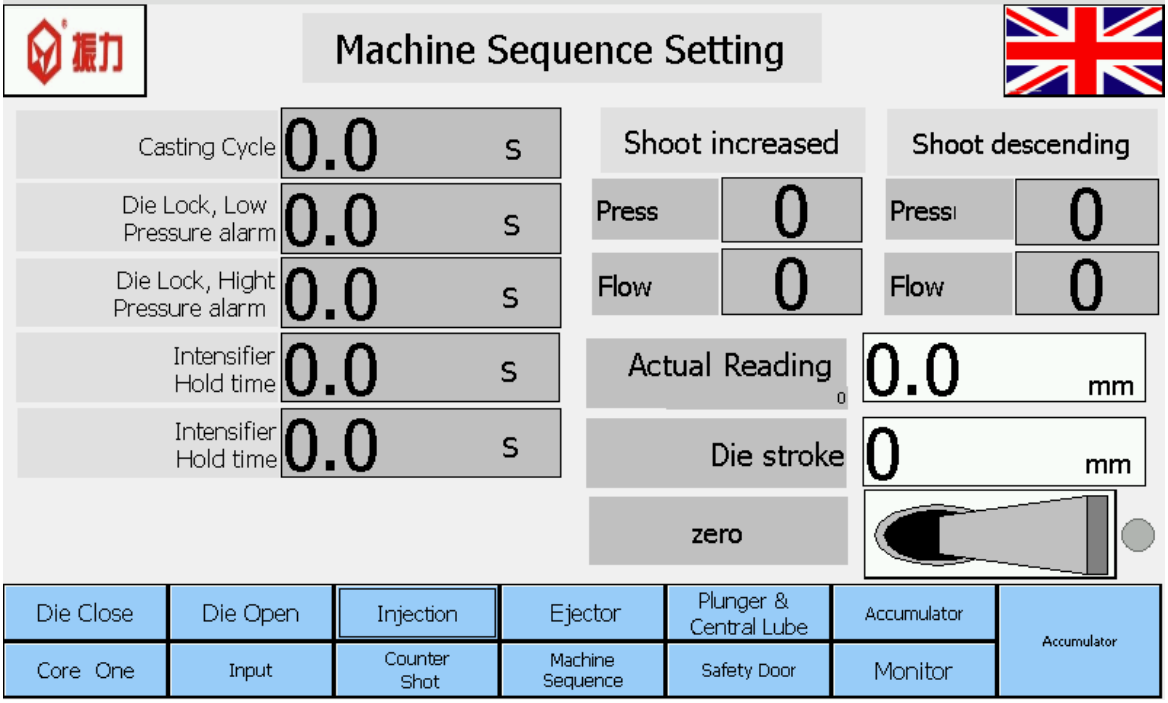


This screen is used for the sensor parameter setting of the die casting machine: the return hammer storage setting

Energy storage pressure and energy storage flow setting, and set energy storage time,

When the system is equipped with an energy storage pressure sensor, you can choose to use the pressure control mode for energy storage, and stop the energy storage action when the stored energy reaches the set value. Energy storage pressure sensors are divided into: fast energy storage and pressurized energy storage.

When the plunger is returned to the hammer, it is allowed to set the pressure and flow rate when the hammer is returned, and at the same time, the deceleration back hammer pressure and flow rate are performed in the final stage of the hammer return.



Function time screen:

Cycle interval: the interval between executions of the die casting machine after one action is completed, the standard setting is 0.1 second.

Mode-locked low-pressure alarm: When the clamping mode is in the low-pressure position, it reaches the set time, and the low-pressure clamping mode is not completed yet, then the alarm

Mode-locked high-pressure alarm: When the clamping mode is in the high-pressure position, it reaches the set time, and the low-pressure clamping mode is not completed yet, then the alarm

High pressure continuous: After the mold clamping action is completed, the continuous high pressure time is executed.

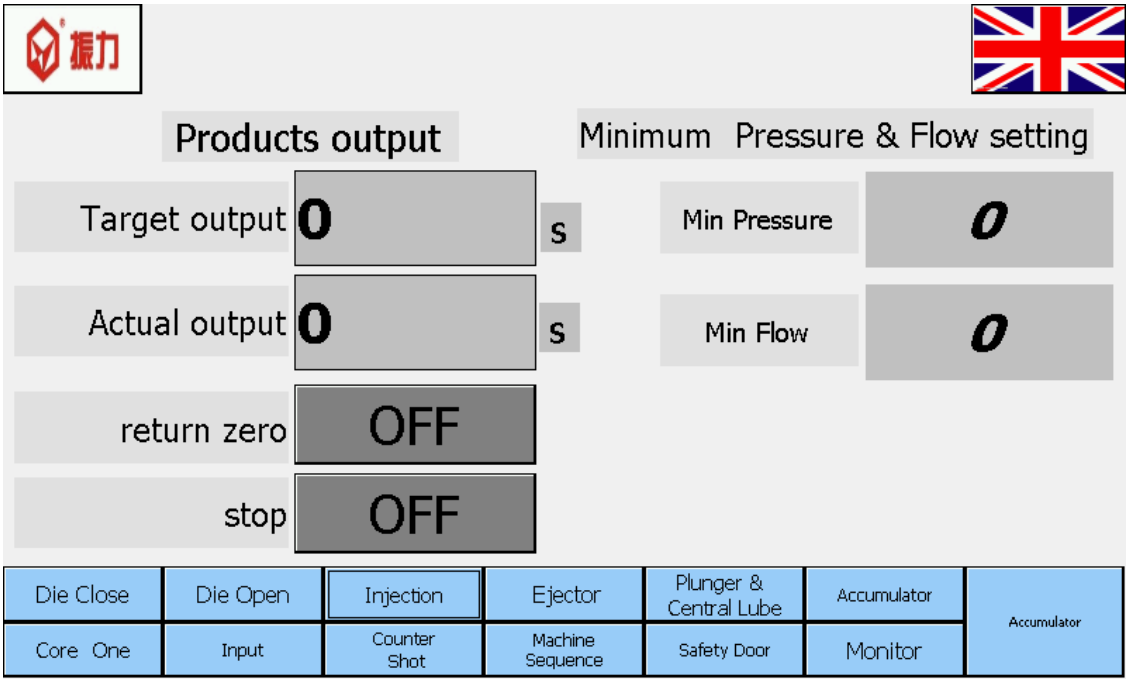
Back hammer delay: In the automatic state, when the hammer return action is executed, delay this time and then execute the hammer return action output.

The rise of the shooting platform: the shooting platform is lowered, and some models are equipped to set the rising pressure and flow rate of the shooting table. The pressure and flow have been reduced.

Electronic ruler: the setting of the mold clamping and mold opening allows the maximum stroke of the electronic ruler to be set. The electronic ruler has been cleared.

At the same time, it can be displayed that the current electronic ruler is the actual travel.

6.11 Management Screen



Management screen divided mold production management and storage management parameters.

Production management

Product number set value: Set product target, and can display the current completions,

Yield resets the current number of completed cleared.

Total cumulative production - the machine is factory set to 0, and then record the cumulative total production. Manufacturers need to operate when cleared.

Start time - when the machine is factory set to 0 ,. After the motor starter is set to "Auto" state, that began to accumulate in mind. Manufacturers need to be cleared to operate.

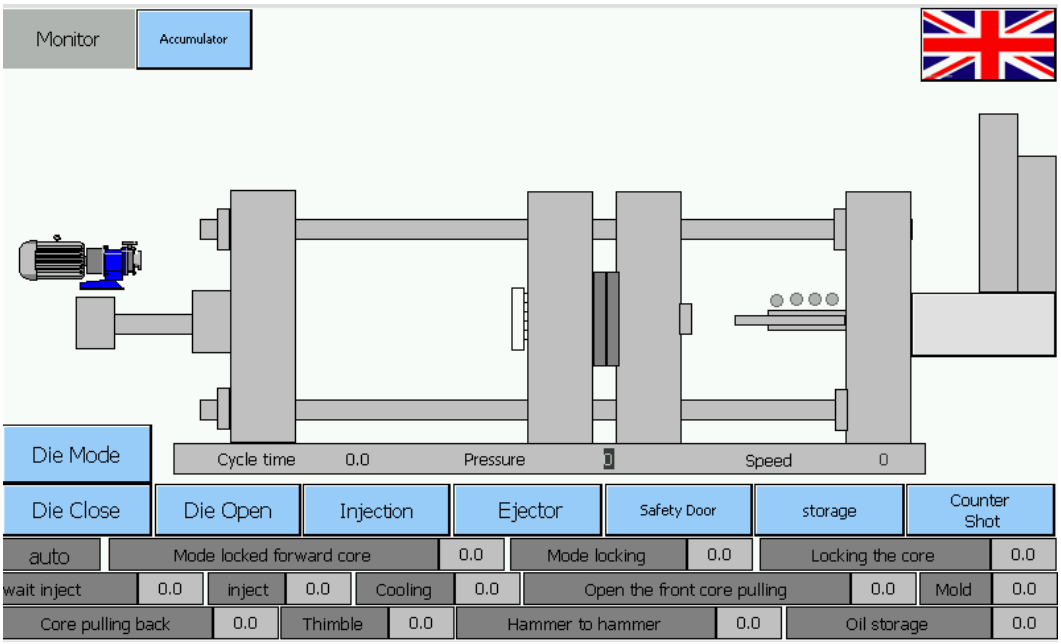
Mold management

This screen is used to mold parameter storage operations, storage capacity with actual

customer specific machine configurations prevail!

Remove mold parameters: In the mold storage screen, enter the number of the need to save the mold number, press the "storage parameter" touch button, set the current data storage (the current data: lock mold, thimble, core pulling, injection, transfer mode, the auxiliary settings, etc.).

6.12 monitor screen



In the initial screen, after the touch monitor to enter the monitor screen.

Change the screen only displays the current status of the machine, through this screen can also inquire about equipment maintenance, alarms, analog and digital information.

Chapter 7 machine start up

7.1Starting up and adjusting machine

Please read this operating manual carefully before operating the machine, and fully understand the structure of the machine, the working principle of operation, and the methods of adjustment, and safety precautions.

7.1.1 Checks before start of new machine

1. Appearance:
It requires the whole machine with beautiful and harmonious color, no blistering, damages and other defects;
2. Completion
Requires that mechanical, electrical and hydraulic and other parts for the machine are available, and metal objects (such as keys, plunger sleeve, the cylinder cushion covers, plunger, etc.). Besides, safety door installation is complete, with flexible operation.
3. In good position
Inspect electrical components, hydraulic parts, machinery parts, especially sheet metal, rod, guide rod, slide seat plate, piston rod, steel ring, fixed plate surface,to check whether their surface have scratches, corrosion, or deformation.
4. Keeping clean
Keeping the whole machine is clean, and ensure no debris inside and outside of the machine. To clean the lever, sliding seat plate, fixed plate mold with rags. In particular, to ensure that the tank is clean as well as the oil.
5. Electric wire
To connect the electric wires according to the requirement listed in Chapter4. 6. 6.Hydraulic oil
1) Check whether the grades, specifications, models of hydraulic oil meet the requirements of the machine (fireproof oil / Normal pressure oil);
2) Check whether the fuel tank, refueling appliance is clean, the installation of the air filter is good or not, and the connection with the tank is ok or not.
3) check whether the hydraulic oil has reached the level of the the standard one, and to see whether the tank is leaking or not.
7. Lubricating oil and greasing oil
1) To check whether the connection with oil pipe, oil discharge, oil connector and pipe joint is ok or not.
2) oil tank is already filled with lubricating oil
3) the rod and nut, nut and wear rings and other friction parts have been painted with greasing oil.
8. water cooler is installed according to the relevant requirements in Chapter IV.
9.nitrogen in the accumulator is filler according to the relevant requirements in Chapter IV.
10.Compressed air is connected according to the relevant requirements in Chapter IV.

7.1.2Starting up the machine

1. power on.
2. Check that the PLC is working properly.
3. Spin "manual / automatic" button in the operation panel to the manual mode.
4, Check the main pump running direction:

Press the button to start the motor. That is to say, to press the button to make the motor work. If the motor is working, please press the button again. You can observe the motor at the backside, if the tail blades rotate in the clockwise way, it proves the the motor is normal. If not, you should power off. And then exchange any two of the three-phrase lines connecting with the power supply and main panel until the motor can rotate in the clockwise way.

Note: before you are sure whether the motor is working in the right way, please don't use the motor for a long time, or you may cause any damage to the motor.

5. The daily check of the oil pump working pressure

① set 0bar for the total pressure at PLC.
② loosen the adjustment handle of the the pump valve V1.
③ after starting up the pump, please press the "Intensifier" button, and then set the line press from 0 to 60 bar.
④and then tighten the handle adjustment of V1 upside to make the pressure rise, until the pressure gauge P1 shows 60 bar. Next, adjust the small pressure gauge to make its pointer point at 0 bar, and then adjust the pressure gauge to 60 bar. At that time, you can stop adjusting and tighten the handle gradually until the line pressure reaches 150 bar. The safety pressure of proportional pressure V3 has been adjusted well before delivery, so you can save the necessity of adjusting it. So do the pump working pressure.

Note: when the line pressure reaches 0 bar, the pressure gauge P1 should point at 0 bar, or you should reset V1.

⑤ the gradient adjustment of the start up pressure and decreasing pressure

Adjust the buttons "↑ ↓" on the pressure and flow board until each act of the machine is smooth.

⑥ linear pressure adjustment

Set different pressure values on the touch screen, such as "120", "110", "80", "70", "30" and other values, and then press the pressure button. It is ok if the table G501 display value and the setting value are within±5bar, or you need to repeatedly adjust the Max and Min button on the pressure and flow proportional pressure board in order to meet the requirements.

⑦ system flow adjustment

The system flow is controlled by the proportional flow valve and adjusted by the flow proportional board while the change can be showed on the touch screen.

After starting up the pump, when not building up pressure, adjust the button MIN on the proportional flow board until the working flow is 0.1A. And then set the system flow as 100% on the computer; next, please press the building up pressure button, and then adjust the MAX button on the pressure flow board until the flow reaches 0.8A.

The gradient can be adjusted through the button "↑↓" on the pressure flow proportional enlarged board.

6、Checking line working pressure

Press the "line pressure" button, to see the pressure gauge on the building up pressure board,

to check whether the valve of the pressure gauge reaches the line pressure. If not, you can contact us.

Before delivery, we have set the line pressure well. So, please dont reset the line pressure without serious thought. But you need to recheck whether the hydraulic system working pressure is normal.

7.1.3 Manual Commissioning

(1) die open or die close: set an appropriate valve for the locking pressure as well as die open pressure. Turn to the button “manual/automatic” to manual, and “ open/close die lock speed” to slow speed. Press the two buttons “ start” at the same time and the movable plate is moving towards the fixed plate. Then press the button “die open”, the movable plate will move in the opposite way.

(2) ejection system commission: first you can set an appropriate valve for the ejection pressure. When the die open is at position, please turn the ejection button to “ Ejection Forward/ Ejection Backward” for the purpose to commission the machine.

(3) the test run for the plunger: when the die open is at position, please turn the “ plunger” button to “ plunger forward”, and the plunger can move toward to the fixed plate. If you turn to “ plunger backward”, the plunger will move toward to the accumulator.

(4) mold adjustment: please switch on the button of “die height”, and press the button “ die bwd”, the rear plate will move away from the fixed plate. If you press the “ die fwd”, the rear plate will move toward to the fixed plate.

7.1.4 slow speed injection commissioning

Firstly, turn the button “manual/automatic” to “manual”

And then, turn the button “plunger” to “plunger backward”, to make the plunger back to the starting position.

Check and set the position of proximity switches.

Next, set a suitable position value for the “plunger forward” in the touch screen.

7.1.5 Injection commissioning

When the machine is working auto mode, you can doing injection active, the first time injection commissioning, To ensure the shot commissioning smooth, we don’t suggest second fast speed injection. The following description is the active cycle process of automatic injection.

(1) reset all the devices, such as die open limit, ejection backward limit,plunger backward limit and so on.

(2) turn off the second fast speed injection, and forbid the second-fast speed shot switch to “OFF”.

(3) the working mode should be “automatic”

(4) close the safety door to the limit and then press the both buttons of die lock.

(5)after die lock, the machine will store energy automatically and when shot is ready, the

signal light will be on.

(6) press the button “ shot”, the plunger will move forward.

(7) after cooling for a certain period, if you do not choose plunger follow, the plunger will move backward. If you do, the plunger will stay at the same position until die open.

(8) and then die open automatically

(9) the ejector forward or backward (the times to eject will depend on your setting)

(10)、ejector backward limit, a cycle finish.

If you need to quickly open the folder for debugging, it is recommended to install the test machine die pad and into the barrel and the plunger and in the feeding tube into enough soft cloth cushion, in order to avoid pressure shot punch impact damage.

According to the above procedures, only two speed switch is set to ON". When debugging, the two speed press is set to half of its maximum speed.

7.2 mold installation and commissioning

7.2.1 prepare before mould installation

1, measuring the mold length, width, height, according to the measured data, compare the parameters of the data in the table, determine whether the mold can be installed on this machine;

2. Measure the inner diameter and depth of the die positioning hole, and compare the external diameter and height of the fixed template into the hole;

3, the measurement of mold positioning hole and mold outside the plane of the distance, the second chapter of the control parameters of the parameters of the table to determine whether the machine and mold matching;

4, measuring the roof of the board size, compared with the relevant data in the template size chart, it is appropriate to determine the machine;

5, according to the parameters of mold design, adjusting thimble stroke and lateral mode of limit switch, to adjust the die thickness does not cause mold damage;

6, ready to die plate, pressing plate pad, pressing bolts, nuts, flat washers, wrench, pipe fittings, etc..

7.2.2 mould installation and pre-heating

1, will be matched with the mold into the barrel mounted on the pad set on the head plate;

2, measuring the thickness of the mold, and then adjust the mold, so that the machine in the machine hinge state, the distance between the head of the board is less than the thickness of the mold 1~1.5mm.

3, good die rings, try to confirm the safety of rear lifting crane;

4, mold in place, off the pump to stop, will die hanging in the head in the middle of the board, to adjust the mould position. When the gate and pressure chamber center line, the human will die onto the head plate, until the gate set smoothly into cylinder steps, gently rotating die to ensure mold venting holes vertical upward or downward, template face and head plate affixed flat. Check the level of the code after clamping and screw down.

Note: absolutely not allowed to vent to hold the author, otherwise it will cause harm to human body.

5, installed a thimble rod or plunger rod;

6, start the motor, choose a slow lock mode, the mold pressing and clamping the mold clip on the plate.

7, slow unlocking mode repeatedly, mold guide column should be able to successfully enter the guide sleeve, and locking die force adjustment (new machine locking die force without adjusting too tight)

8, open end, adjust the thimble ejection stroke required casting will not fall naturally, and can be removed easily by fixture.

9, if the mold has a hydraulic core pulling mechanism, pay attention to the core pulling action program, to ensure that the core pulling action to meet the requirements of the process.

10, install mould cooling pipes and water check Water Leakage phenomenon.

11, review the installation mode, with particular attention to mold clip is tightened, confirm without any error, mold in place, clear die of oil.

12, will have to assemble the hammer handle is mounted to the machine on the connecting

plate, manual hammer of hammer, hammer in the pressure chamber movement should smooth freely. Check installation hammer hammer handle, feeding tube is loose.

13, with the oil gas spray gun preheating mold, so that the parts slowly heating up, to its cavity, core surface temperature is 150~200. Preheating the mold can prevent the mold temperature is low, the casting of the cold to produce the package type force increases, leading to the failure of the push rod type core. In the preheating process must pay attention to the prominent part of slender and sharp to avoid overheating.

14, preheating of the die to inspect each moving part, pay attention to moving core push rod, a pull rod, a slide block, there shall be no card die scene and coated with oil thimble.

7.2.3 parameter adjustment

1, pressing injection chamber diameter determine appropriate hammer, put back to the hammer in place of Ji moved to the back of the, use the manual to hammer hit the feeding piston back to finally end and installed the hammer assembly.

2, gently rotating hammer assembly, hammer shot in the interior of each position should be flexible, easy, no obvious resistance.

3, the use of manual hammer, hammer when highlighting the fixed mold surface 10-20mm (0.4-0.8inch), stop motion. At this point according to the "current position" in the picture, set the end position of the press. Return to the hammer before the hammer again, confirm the correct position of the hammer.

4, adjust the opening stroke, the mold in place after moving die and the distance between the fixed die than molding in this direction length grow 5-10mm 0.2-0.4inch, to prevent thimble rod bad die and to the top of the workpiece.

5, in the operation screen adjustment thimble stroke settings to adjust the ejector stroke, to ensure that the ejection products can be smoothly push out, back to the top of the thimble can be returned to its original position.

6. If the die is designed to have core pulling, it is required to connect the soft throat and the limiting switch of the core pulling device.

7, before and after the moving core and core pulling back to the limit of the system, the core of the core to be willing to adjust to the appropriate location.

8. according to the nature of the product to choose the appropriate clamping force, in order to ensure the qualified products, should choose the minimum clamping force, which is conducive to extend the service life of the machine

7.2.4 Adjustment of auxiliary equipment

1, if the environment temperature is higher need to connect the mold cooling device, in the beginning of die casting products, should not provide the cooling water, the mold preheating and then provide cooling water.

2, adjust the school to the soup machine, take a machine, the movement of the sprayer, speed and position, so that it can work safely and efficiently; the adjustment method of the manipulator, as detailed in the manual.

3, the connection head cooling device.

4, adjust the hammer lubrication device.

5, in accordance with the automatic operation mode using slow press shot material, in order to preheat the mold and check whether other abnormal situation.

Note: when the test production is not allowed to use the rapid pressure and the higher the pressure of the pressure, it will be possible to produce personal injury and machine damage.

6.3 machine auto operation

Correct parameters and select the corresponding function through the operation panel input.

B. all emergency stop button reset.

C. press the oil pump start button, power indicator light.

D. press the button, the energy storage, some machines with automatic energy storage function, after starting the pump, the storage can automatically according to the set pressure storage, storage period, the machine is not allowed to operate any operation.

E. will open the lock switch to the fast speed selection switch.

F. manual / automatic selection switch to automatic.

After the completion of the

G. energy storage, both hands and press the operating panel on the two lock button, in the case of the front safety door closed, the machine starts automatic cycle (if no automatic door, it must be closed manually).

H. After the lock is finished, the indicator light is on.

I. press the "injection button", the machine automatically press the action (without giving the soup manipulator).

J. machine will run as follows

Chapter 8 safety protection

8.1 Overview of safe operation

It's advised that customers should strictly implement all indicators, program and advises mentioned in this chapter by manufacturer of die casting machine, and strictly observe the local safe regulation, use the devices which installed on machine or other independently installed safe devices as required.

Manufacturer of die casting machine won't bear any responsibilities of health damage and wealth losses caused by not following the safe regulation mentioned.

This chapter mainly represents knowledge about health and safety and any danger may damage the machine. To ensure the safety of machine, please maintain the machine to make the machine working with any default as per this manual especially Chapter 9 Maintain Machine.

What represented in this chapter only can be applied for the main body of die casting machine. Please look up manual of peripheral equipment for safety of peripheral equipment.

8.1.1 Definition and access requirement of dangerous zone

Dangerous zone means if someone in such zones -inter area and outer area of machine without shield, it may damage health and safety. Dangerous zones mentioned in the manual only allow professional person who have been trained to enter.

8.1.2 Forbib discretionally refitting machine

Manufacturer of machine will not responsible for health harm and wealth losses caused by client discretionally change running program and machine features which may cause danger without written consent from the manufacturer.

8.2Safety operation regulation

Die casting machine is equipped with high pressure fast speed clamping mould device ,alloy shot device for dealing with non ferrous metal melting by high temperature and high pressure electricity controlled light box which are may cause danger.Therefore, die casting machine exist potential danger of clamp injury, burn, and electric shock base on such devices.

Operator should read and fully understand this operation manual before operate and

maintain the machine to ensure safety and utilize the die casting machine at uttermost.

1 Only person with professional knowledge who have been trained can operate the machine.

2Authorised person take charge of machine by using key , avoiding unprofessional people operate the machine wrongly.

3 Forbid operating the machine under the condition of unauthorized changing and taking down the metal plate protection. Operate the machine only under the good condition of safety devices. Forbid changing safe devices.

4 Turn off oil pump, power when enter pillar support area to check or repair. Forbid enter pillar support area without cutting off power.

5 Can't touch the mobile part of die casting machine until turning off the machine.

6 Stop hydraulic pump and load off the accumulator to zero pressure when taking down hydraulic parts.

7 This die casting machine is used to process non ferrous metal material. Buyer processing wrong material by this machine may cause following danger

·Danger to operator's health caused by contacting with hazardous materials

·Danger caused by hazardous or explosive gas when processing.

·Danger cause by liquid material which must be used in processing or liquid material generated by processing products.

8 Waste products and emitted material generated by processing material or processed material must be disposed as per local regulation. Avoid danger to local environment caused by improper disposing.

9 Don't take down safe warning slogan and acoustics or vision alarm signal, fixed or mobil e protective device and other components for protect device. If it is necessary to take down th em because of repair or maintenance, restart all safe devices before connecting electricity.

10 Operator should turn off machine and execute following operation once operator find fail ure of safe device,

·Push emergency stop button；

·Cut off main circuit breaker；

·Report to charger；

·Don’t start the machine until eliminate failure；

11 Don’t wear rings,watches, bracelets,necklaces or other suspended items which may hanged by machine when operating or maintaining.

12 Maintainer should protect machine’s matching surface when repairing. Don’t hit or or trample or dispose heavy stuff on machine. To make sure don’t leave any tools on machine after finishing repair.

13 Operator must turn off power of die casting machine when repairing,cleaning and commissioning the dangerous area which require people enter the mold area. Restart power after finishing these operations and exit from dangerous zone.

14 Exclude gas and dust which do harm to health

Some materials may cause harmful gas,smog and dust when processing (melting alloy or spraying release agent). If these gas, smog and dust must be generated, user should use vacuum drainage and discharging system to eliminate that.

15 Personnel training

Operator should safely operate machine and use correctly personal protective outfit. The company can provide train for buyer. In order to better understand training content and get satisfactory training effect, it is advisable that the trained personnel possess basic knowledge of machine and tools usage.

Training course includes theoretical part and practical part, the focus of the training content includes:

·Security requirements

·Understand and grasp knowledge of composition of the machine

·Know what is the correct machine operation, what is incorrect machine operation;

·To master the regular maintenance of machine;

·Know how to safely stop machine and related processing ability in an emergency ;

·Removal of usual fault

Machine buyer who need training can contact the relevant market sales staff get training courses and other related information.

16 All personnel who are responsible for the machine operation, maintenance and repair must read and master the relevant technical data in advance.It is advisable confirm in written

that they indeed have meet the requirements. It is suggested that clients should confirm the charger of operation, maintenance, repair in case of avoiding buck-passing which led to incorrect usage and poor machine maintenance and other seriously threaten safety situation.

17 Inspection before starting die casting machine

·Ensure safety door smoothly operated , limit switch of front and rear safety door should be normal. Get through the machine power, close front and rear safety door,to observe the electrical box PLC corresponding input signal.If the light brighten,it shows that machine is normal. If the light not brighten, user should stop the machine and check corresponding wire line. Confirm can not clamping by half-opened door.If the door opened during clamping, clamping should be stopped.

·Check the emergency stop button,ensure it should be normal. Check the total pressure of oil pressure system function, all kinds of parameter Settings which should conform to the requirements.

18 Notes when starting machine

·Do not reached clamping zone of die casting machine or tale out material unarmed.

· Set the parameter on industrial man-machine interface screen. It is not allowed to adjust the machine and set parameters without permission. It is not allowed to set parameters when machines are performing automatic cycle.

·Stop the machine immediately when failure of machine happened and alarm signal including alarm lamp, buzzer ring out . Cut off the machine, open protective door, report to maintenance personnel. Turn off pump when repair.

·Choose high quality of die casting alloy ingot, avoid throwing the moist and oil stained alloy material thrown into the furnace.

· recycling material of alloy ingot requires special treatment to determine the chemical composition whether it meet requirements. After confirmation, it can be used again.

8.3 Danger zone

When operating the machine, the operator must know which part of the machine is dangerous.

8.3.1 Machine hinge

People can not enter the hinge zone when closing mould,, otherwise it may cause physical injury; If you must enter the hinge zone for inspection, cleaning or maintenance, you must stop the oil pump motor and release the oil pressure of accumulator.

8.3.2 Ejector

Stop motor and release oil pressure of accumulator when adjust injector stroken

8.3.3 mould Clamping zone

If you must enter clamping zone for inspection, cleaning or maintenance, you must stop the oil pump motor and release the oil pressure of accumulator.

8.3.4 Injection area

Operator must stop the oil pump and release the pressure of the accumulator, when install a material connection rod or check and clean the sleeve. If the oil pump motor is in working status, accumulator is not unloading, it is not allowed to put hand in material entrance of sleeve, lest causing damage (Plunger may slowly move when machine in failure state and oil valve have leaked. Remember to release pressure of accumulator)

It is not allowed to stand near the sleeve when processing die casting, because the process of injection, metal fluid may spatter from sleeve. Plunger gap increasing may cause alloy material splash back when injection, please replace the hammer head.

When die casting processing, the molten metal liquid needed to ladle from furnace into the sleeve. During feeding period,anyone is not allowed anyone to enter the area.

8.3.5 Many parts of machine exit potential danger

The move parts of the machine like ejector, core pulling etc.

·Sharp edge parts of the machine and other parts may cause hurt, etc

·Electrical Hazards

·High temperature part of the machine (including the melting pot, ladle spoon, sleeve, hammer head, molds, hot oil pipeline etc);

·Sudden rupture or damage (such as trample the mechanical sheet metal when maintenance

·Clamping die gear move；

·Danger caused by accumulator releasing energy (such as unload oil valve before pressure relief

·The machine is in a state of failure which may cause danger

8.4 Safety device

For the operation's safety and to protect the operator, the machine is equipped with the protective facilities. Do not destroy the protective device or drive system.

Please do not move or dismantle safety signs on machine, safety protection facilities, otherwise, safety of person or machine can not be ensured

Please do not operate the machine if you cannot guarantee that all equipment work normally. Check all the equipment before starting the machine .

8.4.1Protection for mobile parts of machine

The move area around the machine are installed front door, rear door, , middle plate header,tail plate header ,baffle for splashing, machine hinge cover for preventing the machine hinge, injuries and accidents when plate and injector moving, injuries and accidents caused by the reason that dynamic and fixed template joint is not firm

8.4.2 Protection of front and rear machine door

This series of cold chamber die casting machine adopts manually opening and closing front and rear door. The security door should be closed during working in order to prevent from personal injury and damage caused by spattering metal liquid from mold joint . Two switch on front and rear door can check whether the safety door is closed.

1、When the front door is closed , press limit switch of front door

2、When the rear door is closed , press limit switch of rear door

3、Close die after the front and rear door closed,and limit switches of front and rear door sending status signals to PLC control system, and PLC control system confirmed. Otherwise, machine can not close die.

8.4.3 Emergent stop safety protection

This series of cold chamber die casting machine has many emergent stop buttons which are installed on main electric box, operation screen, shooting small electric box, rear door. Motor would stop when pressing any emergency stop button during machine working.

Clamping speed of machine is very fast. Must not cross the door and enter into the clamping area when clamping, in case of causing personal injury.

87.4.4 Alarm light and buzzer

Alarm light and buzzer can provide visual and sound alarm for operator.

8.4.5 Key switch

Installing key switch for clamping can prevent from maloperation.

8.4.6 both Hands clamping button

Clamping electrical control adopts hands clamping button. Clamping action will stop if you loosen clamping button by two hands or one hand when clamping process.

8.5 Major precaution and treatment of die casting machine

8.5.1 Fire prevention and treatment

It is recommended that the reference established emergency treatment plans when encountering fire. In addition, if the machine is running, the machine should be immediately disconnected main switch for supply power to the machine. Cut off the power grid, report strictly observing safety procedures and use a fire extinguisher for emergency treatment.

Considering the die casting gold components with high voltage, according to the safety

rules, it is strictly prohibited that using water and foam fire extinguisher to put out the electric fire

Prepare a fire extinguisher specifications and operating procedures for using fire extinguisher . Alarm working with electrical systems and using this kind of fire extinguisher would produce poisonous gas so it must be fully ventilated after using.

8.5.2 Release harmful smoke

Machine should be equipped with suitable filter smoke exhaust system because of fog caused by some specific material. The smoke gas emissions into the atmosphere shall be governed by the laws of the current local laws and regulations of relevant standards.

8.5.3 Precaution and treatment of electric shock

Risk of contacting electric components when connecting machine external wire. Precautions are as follows:

·Upstream circuit breaker installed on the machine electric line to ensure the protective function of the circuit breaker in the set values for the appropriate range, which can effectively protect the power supply load;

·Make sure the power lines diameter match the machine power;

·Ground before connecting the power lines

8.5.4 Risk of protruding object collision

When machine make operator fall, mechanical, sheet metal, pipes of die casting machine may damage physical safety.

Machine operation area and the platform should be anti-skidding , the ground and the platform slippery liquid should be cleaned and eliminated in time. The die casting machine adopts anti-skidding plate production platform, but if there is any hydraulic oil or lubricating oil left in the plates which will severely reduces the anti-slip performance. Please make sure to clean it in time. Operator must wear labor insurance outfit in the workspace . Lifting personnel must possess the relevant professional knowledge.

8.5.5 The risk of squeezing

Work in the following areas exist risk of squeeze:

·Near the injection piston;

·The area between the template

·Core-pulling injector and other oil cylinder movement area Protect and cut off power supply of the main power box:

·Stop machine and cut off the main power of the electric box;

·Cut off the power supply circuit breaker and lock to prevent anyone starting machine by accident;

·Put up warning signs beside the machine.

·Pay special attention to: when oil valve of machine in fault state, the accumulator have pressure oil which cause danger by pressure oil spilled into oil tank leading to piston rod slow movement even stop the machine. Therefore, when taking down hydraulic components, pressure oil of accumulator must be eliminated in above area.

he outage may have caused by spilled into the cylinder inside pressure oil through the piston rod, slow movement and it will bring danger. So in the above work or need to remove the hydraulic components of the region must have diarrhoea except the accumulator pressure oil.

8.5.6 High temperature danger zone

Don touch unarmed following components to avoid scald when you cannot confirm actual temperature

·Furnace, crucible

·Ladle spoon. Forbid working in movement area without any protection.

·Sleeve,plunger, plunger rod

·Mold including chilling water of mold and hot oil pine of hot mold machine

·Molten metal material area: include fused machine or other equipment working area

·Wear protective clothes to prevent skin burn caused by high temperature metal .

8.5.7 Precaution of electric shock

Should take following precaution

·Keep the body and the clothing drying when operating of the electric controller

·Can not put switch on surface of wet stuff.

·Keep good insulation of the electric box, electrical boxes and all kinds of electric components, work in damp places. Operator should must wear insulated gloves and safety shoes;

·The power switch on the wall should be configured with fuse protector is suitable for the fuse, the power switch can quickly cut off power in an emergency situation. Forbid putting stuffs on power switch slide, which can avoid hindering operator to cut off power in an emergency situation.

·Sizes and kinds of the power main line must conform to the electrical specifications;

·Check the shell of the main line to see whether it is damaged or broken, conductor bare may cause deaths, so if the wire insulation was damaged and wire insulation must be replaced immediately.

·Operate circuit switch only when outer cover of power device is in the correct position.

The power supply connection bared which will cause severe electrical accident

·Ban simplifying safety interlocking device;

· Must disconnect the power switch when electrical system maintenance. Must wait for five minutes after disconnect main electric eye, discharge the capacitor and avoid serious electrical risk events;

· Make sure to connect the power line ground wire with tower grounding,connect the power supply ground wire with the GND terminal of the main electrical box correctly

8.5.8 Fire prevention

·Cutting off power ,the switch may cause spark. To prevent fire, flammables should far from the switch position 10 meters.

·Must be quenched or slow cooling when dealing with high temperature metal , otherwise it is forbidden to put high-temperature metal and flammable items together;

·Forbid using electric spark or high temperature gas cutting method to handle containers of flammable liquids (including the accumulator and the nitrogen bottle);

·Never use switch which may cause spark in areas where it is concentrated with inflammable powder, flammable gas and combustible liquid gas

·Regularly check the wire connection, handle it in time once finds loose. Avoid fire caused by local contact resistance overheat because of loose connection,

8.6 Attention for die casting machine parts

8.6.1 Clamping system

1）When machine move the safe door should be closed , to prevent the mold parting surface metal splashing out and burns operator.

2）Adjust mold thickness. Forbid starting clamping motor when closing die, otherwise it will destroy adjusting die system.

3）Don’t stand on the top of machine, when machine opening or closing die

4）Before adjusting the clamping force, to preheat the mold on the surface of the inner cavity mould temperature is close to 200 ℃.

5）To prolong the service life of the machine and ensure the machine running smoothly , adjust clamping force to meet the requirements of die casting process and avoid exceed the rated clamping force, so as not to damage the mould; Appropriately reduce the clamping force can also extend the life of the clamping curve elbow mechanism.

8.6.2 injection system

1）Don’t cold shot: When real shot, products should be heated to a certain temperature in advance according to product, the general temperature is about 200 ℃.

2）When adjusting the valve in the pump or energy storage circuit, unload hydraulic oil of the accumulator

3）Attention for accumulator

A、Inflate according to the recommended inflation pressure ,noted that it cannot exceed the permitted maximum working pressure. There is no gas leak after each adjustment.

B Liquid pressure must be reduced to zero (observe energy storage pressure gauge on machine) when unload the accumulator or repair

C、Please contact our customer service department for accumulator components repair and replacement

D、Unload all liquid and air before disassemble the accumulator every time

E、Accumulator is high pressure vessel, check external macro crack at least once every year , an internal testing inspections every two years, compression experiment examination triennially, for the useful life of more than 10 years of container, internal inspection external macro crack should be done once a year

8.6.3 Cooling system

1）Ensure cooling water can be transferred to need cooling parts, such as mold, hammer head, cooler, fixed plates, etc.;

2）Cooling water system of machine, open injection punch heads and fixed plate cooling water route when starting machine. Cooling oil should based on temperature of oil.When the oil temperature rise to above 30 ℃ , operator should timely open cooling water; When the environment temperature is lower than 0 ℃ and downtime is too long, close the oil cooler water and open the drain to emit all water in oil cooling machine in case of damage to oil cooling machine caused by low temperature.

7.6.4 Hydraulic control system

1）Under the condition of normal operation of the machine, observe oil temperature every hour. When the oil temperature reaches 55 ℃, the machine will automatically stop and alarm, operator should immediately check (whether cooling water system and the oil temperature 'working is normal).

2）Check the quality of the hydraulic oil to ensure machine run efficiently;

3）Every time change the pressure oil, oil filter in the tank should be clean

4）Inject enough hydraulic oil before running oil pump, and then repeatedly switch pump

two to three times , if the oil pump have abnormal sound, operator should immediately stop and find out the reason;

5） Stop oil pump and start it after readjust if the pressure show value exceed the setting value when pressing.

6）When removing any high pressure component(hydraulic valve and pines): Because there may be residual internal stress, need to slowly loosen screw or nut, after discharge residual stress, then all loosen the screw or nut especially when removing the hydraulic parts related to the accumulator operator should open the unloading valve at first. Such operation should process in machine stopped condition.

7）Oil pump couple operation: couple supplier connect cylinder liner on the coupling and aluminum core by bolt before shipment. Do not loosen the bolt. If loosen the bolt by accident, supplier should reset it.

8.6.5 Electrical control system

1）When operator installing a mold, machine should be adjust the in the "manual" mode.

2）Safety door switch should be checked regularly, it should be timely repaired r or replacement if finds loose or poor contact.

3）Stop button should be ensure effect at any time, the machine should be in stop state after pressing the machine.The machine won't start periodically again after reset ;

4）Electric box should keep from moisture and heat , ensuring successful running of electrical components;

5）When overhauling and cleaning electricity box components and circuitry, please use tools like the brush. Do not use may water, detergent and so on which may damage the electrical components of the appliance.

6）Cable arrangement must fully consider the chance of molten metal burning, cable should be equipped with protective device when necessary.

7.6.6Lubrication system

1）Please check the oil before starting to see whether the box of oil is full, if it is not full, please add lubricating oil according to the requirements of lubrication schematic diagram; Check the lubrication situation of automatic lubrication, particularly the bent elbow part;

2）Die casting machine should use water-soluble mould lubricant, when using grease mold lubricant, pay attention to the fire.

8.6.7 Others

·Check the cleanness of machine parts before starting machine every day.

·Make sure that all bolts and nuts connected, once find loose, immediately stop the machine, handled by maintenance personnel;

·The machine moving parts on the lubrication surface should be often cleaned which can prevent unnecessary abrasion

·Security door not only can protect casting liquid metal splash hurt accidents, and can reduce the mechanical damage and fire accident happened, so don't need not in production or remove security door;

·When the operator leave the machine or idle for a long time, operator should stop the oil pump. Turn off the power supply in time after work;

·Clean the machine for long downtime. All activities of friction surface and out leakage without surface protection treatment after machining, should be coated with rust inhibitor. Release the accumulator nitrogen, pay special attention to electrical box and other electrical components of moisture proof, and regular electricity and replace PLC battery;

·Check the accumulator nitrogen pressure change in 40 hours after the first time starting die casting machine or a complete repair, replace or clean oil filter core after 200 hours, check the hydraulic oil out again after inspection qualified by the 15 um filters into the tank after 500 hours . Filter (or replace new oil) yearly. See chapter 9 of the manual, the maintenance of the machine.

Chapter 9 machine maintenance

9.1 maintenance summary

Daily maintenance is to keep the cold chamber die casting machine in good working condition, which is an important means to ensure the normal operation of the machine, it can detect the potential failure factors. Daily maintenance can reduce the maintenance workload, extended trouble-free working time, prolong the service life of the machine, improve the economic benefit.

This chapter presents of the maintenance and methods for each parts of cold chamber die casting machine. Please maintain machine for the first time and make regular maintenance plan according to this chapter using ZLC series cold chamber die casting machine.

9.2 Each parts of machine maintenance

9.2.1

1.1 Do not use metamorphic,thickened and sediment of hydraulic oil in cold chamber die casting machine; When replacing the hydraulic oil, emit all old hydraulic oil, and then add a new hydraulic oil.

1.2 Replace hydraulic oil after machine working for 500 hours, replace oil yearly. Before replacing the hydraulic oil, unload discharged filter core, immerge in clean diesel, cleaned with steel brush, use compressed air to blow dry again.

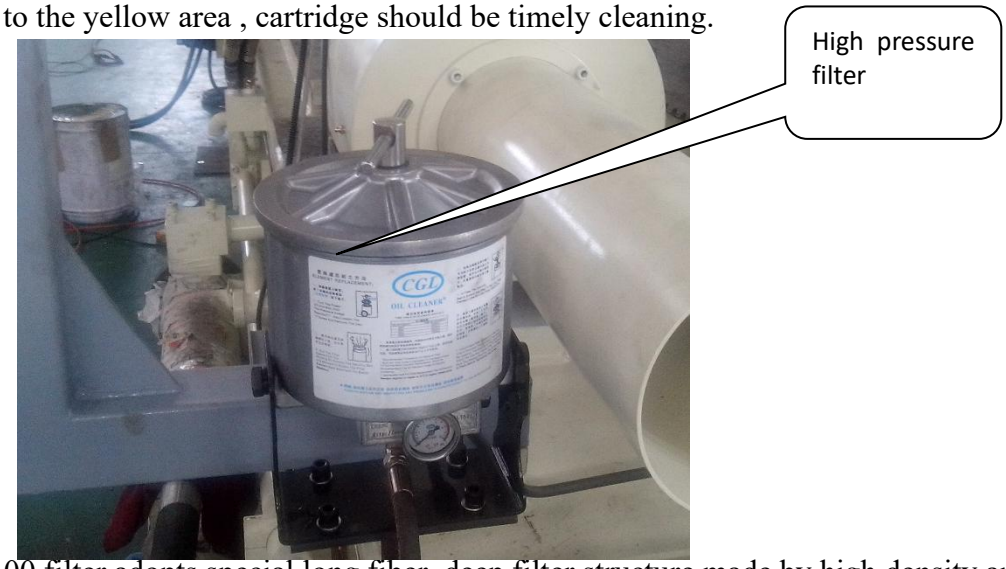
1.3When removing the high pressure parts, slowly loosen the screw at first , then loosen all screw after discharging residual stress, such as hydraulic valve, pipeline, etc.

1.4 Check the tubing connector oil valve, such as the installation of fittings screws, once every six months to prevent leakage or air into the hydraulic system.

1.5 Overflow valve on the oil circuit board , such as proportional pressure valve, pressure reducing valve and other hydraulic valve should be adjusted by professional personnel.Tighten the screws after adjustment, so as to avoid change of adjusted high pressure change during the working process of machine.The oil filter with filter mesh

inside should be cleaned biweekly according to the oil clean degree. About 2 week clean one time.

1.6 Indicator on the high pressure filter should be regularly checked : pointer pointing to the green area shows normal condition, pointer pointing to the yellow area shows mild blockage. Pointer pointing to the yellow area shows severe blockage. In daily work when the pointer points to the yellow area , cartridge should be timely cleaning.



BU - 100 filter adopts special long fiber, deep filter structure made by high density and high pressure processing, its characteristics are as follows:

1.High filtration accuracy(not lower thanNAS6)
2.High filtration efficiency , fast speed , large filth allowance

3. Sets the amount of pollutants for pollution load

4.Strong capacity of removing, absorbing the moisture

5.Long working life, low cost and favorable price

6. Convenient replacement and operation.

The oil filter with filter mesh inside should be cleaned biweekly

according to the oil clean degree.

Loosen the screw counterclockwise, cut off one-way inside, blocking the fuel tank oil outflow, remove the 6 set screw, remove the end cover, take out the filter and clean it, after the completion of the order can be packed, noted: screw must be close clockwise,and then start the oil pump, otherwise broken the ..

1.7 The motor should be cleaned and maintenance once every six months.

Under normal circumstances bearing lubricating grease should be replaced once every six months. Should prevent stuff enter motor body in the process of work. If the air duct blocked,operator should immediately stop to deal with it.

1.8 The nitrogen pressure inspection requirements

1）Pay attention to the phenomenon of nitrogen gas leakage in three working days after starting machine first time

2）Do the first nitrogen pressure check after machine working normally a week. After that check once every other week within two months. Check it once every two months after two months.

When the nitrogen pressure is insufficient, timely supply nitrogen timely.

Often pay attention to the nitrogen pressure, its checking method is as follows: first, stop the machine, reset stop button , and then turning the cut-off valve to unload, observe pressurize oil pressure and second-speed of hydraulic pressure value; When the oil pressure drop to zero, the nitrogen pressure value of the two groups of accumulator are pressurize accumulator and nitrogen pressure of fast injection accumulator respectively.The nitrogen pressure must conform to the specified value in a machine operation manual.

1.9 When hydraulic valve core blocked by stuff which make hydraulic valves unworkable, operator should remove hydraulic valve core , clean it by dip into clean diesel and then blow stuff with compressed air.

1.10 Removing the hydraulic parts which connected with accumulator, operator should firstly open the stop valve and remove until high-pressure oil accumulator discharged removed completely, otherwise it may cause risk of high-pressure tube injection.

1.11 Before delivery, the oil valve have been set-up. According to the needs of die-casting products work pressure of shot, work pressure of pressurize and the flow of the reversing valves can be adjusted.Don't adjust the system pressure, flow rate control and safety pressure arbitrarily

1.12 Should use high quality hydraulic oil, oil change procedure is as follows

1）System flushing

If there are not much water stain and the glue in tank , no black oil which is similar with asphalt, wash with 1/3-1/2 the new oil in oil tank ; Otherwise it need to be rinsed repeatedly until clean

If only adding new hydraulic oil, the system do not need to be washed, hydraulic oil added singly must be the same brand, same mark, the same viscosity hydraulic oil; Otherwise the experiment should be done, the method is as follows: put 75ml new hydraulic oil and 75ml used hydraulic oil respectively into a container, and put another new 50ml new hydraulic oil and 100ml old hydraulic oil mixed into another container.Put two containers in a device with 70-80 ℃ constant temperature. It can not be used if mixed hydraulic oil is hybrid or precipitated after 24 hours, otherwise it can be mixed and used.

2）Inject new oil

The quantity of filling new oil is related to size of machine. Fill the specific quantity of oil according to the machine manual parameter table tank volume requirements.

3）Trial running

Trail running 10-15 minutes after filling new hydraulic oil, operate the machine normally after the temperature and pressure normal.

9.2.2 Electrical part

9.2.2.1 Main motor

1） Check whether the electric circuit wiring is in good condition, confirm if there is a short circuit, open circuit line, missing connection , loose phenomenon, the induction switch, correct limit switch position after trial running the new machine.

2）Confirm the rotate direction of motor is correct the first starting machine or after change motor control line. The method is to stop machine after starting machine, observe the rotate direction from the tail blades by using slow speed while stopping motor. If it rotate clockwise (the same as the motor on the steering instructions) which shows correctly running.Otherwise, cut off supply power , change the three-phase lines L1,L2, L3 in mains boxes to two-phase lines and start die casting machine until the direction of motor movement is match with indicated direction.

3）Start the oil pump motor, motor starting indicator before for other operation

9.2.2.2 Electric control box

1）Electrical control box is key part of the electrical maintenance, strengthen the management of the use of the electrical box in daily work. Open the electrical box maintenance or after setting parameter, close the electric box in time, non-professional personnel shall not open it. Do not push electric control knob change related parameters on the control panel.

2）Controllable potentiometer on the control panel have been set-up before delivery , if need to readjust, location, it should be handled by professionals, so as not to damage the machine.

3）Clean up electric box every three months to keep the internal electric box dry, clean and tidy, electricity box inside can't store any irrelevant items.

4）Daily repair electrical box, keep wires tidy and line number should be conformed to the technical requirements.Redundant line should be cut off, wire can not casually connected or having long bare wires in the electrical box, Timely cover slot cover plate after the repair, lock the electric door .

5） Tighten all terminals in electric box every half a year to prevent poor contact or discharge phenomenon caused by loose terminal, such as contactor input and output terminals,

power input terminal, etc. For large current terminals, ring terminal should be press by special tools, the conductive part of ring terminal should be grind such as ring terminals of motor

6）We should turn off the external power supply switch of machine,the electric power switch, air switch, and in the power switch on the operation panel when power failure to avoid accidental damage to electrical components or accident.

9.2.2.3 External line maintenance

1）Check external lines of machine daily, which should keep lines intact and binding and firm, if the power cord sheath damaged, operator should timely replace sheath.

2) It is strictly prohibited to connect line arbitrarily, line to specification when machine repairing, maintenance, linear should be conformed to the requirements of operation, line number should be consistent with the main electric box number lead shall not be arbitrarily changed or lost.

9.2.2.4 External signal device maintenance

1）Check limit switch (Kat system) and proximity switches monthly: check whether the action of limit switch (Kat system) and close switch is sensitive,whether the screw have loose phenomenon and erase the surface of carbon dust, soil, magnetic materials, etc.

2）If input point on the operation panel without signal during the process of operation, operator should stop to check the input point and the corresponding line

9.2.3 Mould clamping part

3.1 Elbow (hinge) is key component in clamping part, tighten again bent elbow (hinge) every two months

3.2 Weekly check whether the pull rod appearance friction surface has scratches, if there is scratches, you need to check whether the sealing ring(dusty) on dynamic plate damaged or exist stuffs ,clean or replace the sealing ring (dusty).

3.3 Movable type base plate shoe adjustment should be moderate, too tight will cause

exacerbate toggle plate and wear, too loose can cause deformation or wear rod and clamping action may not work correctly.

3.4 Choose low speed of clamping movement speed when die adjusting, set the appropriate pressure and flow.Adjust die after finishing opening die,otherwise it may cause pull rod or adjusting nut damage

3.5 Mold should installed in the middle of plate when installing because eccentric installation will cause uneven pressure leading to curve elbow wear or rod fracture.

3.6 Clean T slot, mounting bolt hole before fastening mould, do not screwing the bolts in the bolt holes which may cause thread damaged.

3.7 Choose "manual" operating mode when installing mold

3.8 The size of the clamping force should choose smaller values on the premise of meeting the production. The long-term work under large clamping force will speed up the curve elbow wear, shorten thelife of components.

9.2.4 injection part

4.1 The coaxiality of sleeve and injection piston rod have been adjusted before delivery. Check the coaxiality of sleeve and injection piston rod yearly, if the value of coaxiality range(Machine injection room before they go out and have adjusted the injection piston rod of the coaxial degree, should test once a year the injection room and injection piston rod alignment, if the alignment value beyond the range (ZLC88 ~ ZLC220 alignment is LE 0.30 mm , ZLC300 ~ ZLC800 coaxial degree is LE 0.40 mm), readjust it .

4.2 If the movement resistance increases , speed become slow or even molten liquid splattered from sprue during process of injection, operator should check timely and change the wear punch and sleeve.

4.3 Check the injection punch cooling system , tighten coupling ensure no leakage.

9.2.5 Lubrication

5.1 Fill grease on the lubricate oil nozzle of machine (usually use lithium grease or molybdenum disulfide grease)

5.2 While opening the power supply,system setting have been opened also. Lubrication oil pump automatically supply lubricating oil to elbow. Bent elbow lubrication is usually divided into manual and automatic lubrication

Manual lubrication: Manual operate lubricate 2-3times before starting machine to ensure every lubricate points filling with lubricate oil.

Automatic lubricate : Interval of automatic lubrication should be set by technical parameters and controlled by computer

5.3 Check toggle lubrication system and pipelines of punch lubrication system ensure every pipelines are filling with enough lubricating oil. If the lubricating oil pipe joint is loose or falling off , tighten it timely

5.4 The clamping device adopts grease lubrication, it should be filled once a month. Before filling, Clean the nut and sub- surface of screw movement, gland and nut interface and the gear drive , and then evenly coated with grease.

5.5 Choose reasonable lubricating oil, do not use different suppliers, different type of lubricating oil, and ensures the lubricating oil is not contaminated. Don't use metamorphic lubricating oil. Using high quality of lubricating oil can make the die casting machine running smoothly, prevent the friction surface scratched and ensure that the machine parts not rust, not corrode, and reduce the loss of lubricant. It is recommend use caltex high quality machine slide way Lubricant (Way Lubricant) No.68 as horizontal cold chamber die casting machine toggle lubricating oil.

5.6 Injection punch should choose high quality lubricants for lubrication.

9.2.6 Cooling system

6.1 Check and repair each connecting pipe of cooling system once a year. If the pipe corroded seriously or leaking, promptly repair or replace it.

6.2 Cooling water of machine should use purification water, filter water by water tower if using

water from river, lake. The filtering device should be cleaned with chemical once every six months.

6.3 Open covers on both ends of the cooler , clean surface fouling with copper tube after the cooler working every half year.

6.4 The machine' hydraulic oil temperature should be between 15 ℃ ~ 55 ℃

9.2.7 Sleeve and injection punch

7.1 Keep aluminium alloy material liquid temperature between 620 ℃ ~ 680 ℃, the copper alloy liquid temperature between 940 ℃ ~ 980 ℃, if the material liquid temperature is too high, it will speed up the injection punch (hammer),wear of sleeve (cylinder)

7.2 Timely clean up the scum on the surface of the liquid alloy crucible, prevent scum into the injection room, avoid scratch surface of sleeve and injection punch

7.3 Regularly add lubricant for injection punch to ensure the lubrication effect,do not replace punch lubricant with hydraulic oil or engine oil.

9.3 Routine maintenance table

Maintenance requirement and security system	Every day	Every week	Every month	Half year	Every year
Check all locations of safety door before starting machine	·				
Check the strength of screws	·				
Check buttons to see whether they will send out the abnormal sound or sudden move when pressing buttons. If so, operator should immediately report to the charger.	·				
Electrical system：					
Blow off the dust on control panel with low pressure compressed air			·		

Check voltage of supply electric is below or equal to nominal voltage ±5%			·		
Check all panel cover is closed or sealed	·				
Clean the internal switch (ji) and electrical accessories				·	
Check the emergency stop button to ensure the correct work process	·				
Check safety protective device	·				
Check and examine switch (ji) and plate whether the in the corresponding (right) pisition				·	
Check stability of the switch (ji)			·		
Tighten terminals and wire connection					·
Hydraulic system					
Check the oil level	·				
Check the oil temperature	·				
Check the hydraulic system pressure	·				
Check whether the oil in the hydraulic system	·				
Blow the nutsch filter with brush from inside			·		
Check the cleanness of hydraulic oil			·		
Check the hydraulic oil filter		·			
Replace filter < if filter resistance pressure is greater than 25 psi (red), it should be replaced immediately >			·		
Replace the hydraulic oil					·
Check the accumulator	·				

Repair accumulator(see accumulator maintenance part)				.	

Maintenance requirement and security system	Every day	Every month	Every year	Half year	Every year
Pneumatic system:					
Check whether air import entrance exist leakage	·				
To purify the air compressor		·			
Check the gas filter		·			
Replace air lubrication filter or 1 bar pressure drop (14.5 psi) to replace it	·				
Check the oil level air lubrication system	·				
lubrication system					
Fill the butter mouth with butter		·			
To check whether there is scratch on piston rod	·				
Check whether the central lubrication system can supply oil normally	·				
Cooling system					
Check the water temperature	·				
Check the water filter	·				
Check water pressure gauge	·				
Clean cooling device,water tower,etc.				·	
Clean cooling water to see whether mineral content exceed standard			·		
Clean the machine around waterway				·	
Shot device：					
Replace the piston rod seals					·
Check material shotting pressure	·				
Mold：					
Check whether the mold is firmly installed on the template	·				
Check the mold water cooling system	·				
Check whether the circulation water cooling system is normal	·				
Check whether the mold cooling system			·		

is normal					

Check whether the mold have installed and debugging	.				
Clean mold	.				
Clean					
Clean the body of machine and the control box	.				
Update the machine work log	.				
Clean machine around	.				
Check machine	.				.

9.4 Others

9.4.1 Service

If you need our more product information ,please contact our customer service department.

9.4.2 Requirement for environmental protection

1）Waste oil disposal

Disposal of waste oil according to local way

2）Broken machine disposal

Scrap the machine after using it exceed the lifetime of cold chamber die casting machine.

Disposal should be in accordance with the requirements of customers district processing, processing scrap machine, must pay attention to the following items:

a、Empty the hydraulic oil of oil tank

b、Release the pressure oil and nitrogen of nitrogen cylinder.

Chapter 10 fault diagnosis

10.1 The basic idea of fault handling

Die casting machine in the process of work once appear fault warning, the operator need highly attention of it and calm, determine the cause of the failure of parts and possible reason, determine the feasible maintenance method. Must remind operators, should be formulated in accordance with the company "procedures" to carry on the work, don't illegal operation, so as not to cause more accidents. In the case of not sure don't blindly remove machine, should first through the technical information to judge the fault, by examining instruments to confirm the fault point, when necessary, can consult professionals (including manufacturers), with a sufficient basis to begin repair machine, remove may extend fault , more desirable brutal removal, may lead to valuable parts damaged, unnecessary economic losses.

Processing machine fault, according to the following steps:

1, by looking, listening, testing, judge fault symptoms and location.

2, analyze the reason maybe causes of the fault .

3, check equipment malfunction records and archives.

4, determine the corresponding processing method and working procedure.

5, and began to repair.

General handling the fault, first deal with easy, then deal with the difficult. first you need to confirm if due to improper use or parameter Setting error cause malfunction. after Exclude these reason, please check electric circuit, then check hydraulic, finally check die casting machine, check in this thinking.

First easy,then Difficult namely is after failure appear, first start with some common, to facilitate observation, exclude those easy problem that May cause failure problems,exclude one by one.

First electricity, then hydraulic, finally die casting machine, namly General order first after Jane usually troubleshooting, you first need to confirm if due to improper use or reference

Setting error cause malfunction. Adjusted according to this reason after the first electric hydraulic and mechanical way of thinking;

Difficult is after easy failure, start with some common, to facilitate observation, exclude those easy failure first,the problems point that May cause failure,exclude one by one.

when appear failure first consider electrical fault, because of maintance electrical failure

the labor intensity is low, the time is short, also facilitate testing at the same time, can be ruled out first. Confirm electrical no problem, Usually need to confirm PLC input and output

point is normal, and cable wire connected to the oil valve line is normal,then can detect the hydraulic system, when confirm the hydraulic system is normal ,then to consider the possibility of a mechanical fault, in the design of the die casting machine, this aspect are considered to .

The all action indicator light and pressure ammeter on the operation panel of the electric cabinet, the purpose is for the convenience to observation and maintence.

When the machine appear a failure, it is impossible to carry out the any one action failure, first consider the electrical, through observed pressure ammeter whether have the corresponding current instructions, input and output module whether have the output, quickly determine the electrical whether have problems, can effectively narrow the scope of the some troubleshooting, have twice the result with half the effort, so that can find the failure Point as soon as possible, recovery machine production.

10.2 usual fault treatment

this cold chamber die casting machine equipt computer touch screen, once machine appear problem, some fault will display on the touch screen, can directly treatment according to touch screen shows fault location. Please reference to PART 6 alarming information table.

Below is the maintence treatment method of machine common fault,only for customer reference.

10.2.1oil pump can not start up

Inspection and analysis: press the oil pump start button, observe whether the motor relay is actuation.

1) if relay no actuation ,then check

A, whether the motor hotl relay action or damage.

B, power supply circuit is normal (using a multimeter to check) or not

C, start and stop button contactor whether normal, whether the control circuit disconnection, and urgency stop button whether have reset .

D, whether the relay coil damage (using the multimeter to check).

E, PLC control oil pump start and output point whether have output.

2) if the relay have actuation after oil pump start up,then check

A, whether the oil pump wear damage.

B, the electric circuit from relay to motor whether is normal.

C, the oil pump whether is damaged or assemble too tight. Hand toggle coupling should be relaxed, axial movement coupling should be about 3 ~ 5 mm gap is more appropriate.

D, motor whether appear stuck phnomoment , caused by coupling and other reasons.

E, relay whether is damaged.

10.2.2 press oil pump start up button, hot relay tripping

Check and analysis: press oil pump start up button, hot relay tripping, this is related to current,overload and 3 phase resistance symmetry or not.

1）Motor hot relay broken or whole current too small.

2）Voltage too low lead to current increase or three phase voltage imbalance

3）Motor three phase winding value resistance imbalance.

4）Whole pressure or double pump pressure adjustment too high, lead to machine overload running ,then tripping.

5）Oil pump broken or assemble too tighten, lead to motor overload running then tripping.

6）Motor damaged and jammed

10.2.3 no main pressure

Check and analysis: after start up oil pump, press “charging pressure” button, first observe pressure and flow indicate ampere meter have indicate value or not. Then confirm proportional pressure valve(proportional flow valve) solenoid coil have electric current or not, to distinguish fault is electricity or hydraulic .

1）If have electricity current output, then check

A、 Oil pump reversal or not (person face oil pump axle direction,clockwise rotate is corotation)

B、Check overflow valve, to see it is improper adjustment or stuck

C、Check shut-off valve close or not

D、 The throttling of Proportional overflow valve whether lost or loose

E、System whether appear leakage and can out build pressure.(such as first speed,

second speed oil valve whether stuck and appear leakage)

2）If haven't electricity current output, then check

A、 Current plate whether normal, pressure proportional amplifier board whether improper adjustment or damage.

B、Observe computer whether work normal, with hand press"charging pressure" button, see the corresponding point in the computer computer whether have input, main pressure point whether have output, if no input, then please check the circuit between "charging pressure" button and computer whether normal, if have input but main pressure point no output, it is computer fault or rear door haven't close

C、Check the circuit between electricity proportional board output and oil valve whether normal, electricity proportional coil whether normal.

D、 Check pressure setting whether normal.

E、+24V whether have appear the phenomenon of ground connection

10.2.4 no automatic

If manual action are normal, but no auto action, then should check safet door limit switch normal or not, related action whether return back to original (according to auto action condition). Cold chamber die casting machine should satisfy below condition before doing auto action: safety door input signal point, auto input signal point, mould close input signal point, ejection back limit input signal point, plunger return back limit input signal point should normal, adjust mould option switch cannot choose.

If manual action abnormal, should first check and exclude.

10.2.5 can not adjust mould

Check and analysis: chooce adjust mould way doing operation, machine can not realize adjust mould action, should check follow content:

1) adjust mould action condition whether satisfy, whether in open mould condition.

2) Adjust mould pressure valve whether setting too low.

3) Manual operation whether correct.

4) If above check are no problem, then please check follow content:

1. Adjust mould hydraulic motor whether stuck.
2. Valve core of Adjust mould hydraulic valve whether stuck.
3. Adjust mould structure each drive parts whether wearable or stuck.

10.2.6 whole machine no action

Check and analysis: after start up oil pump, whole machine manual,auto are no action, with hand to press “charging pressure” button(pressure, flow are has setting parameter) , see whether have pressure, whether have alarm.

1） if no pressure then check

A、current board whether damaged or insurance tube burn out.

B、FP-03 board input output whether normal.

C、check proportional overflow valve whether adjustment proper or damage, stuck.

D、computer working setting whether too small

E、pressure flow setting whether too small

2）if have pressure ,then check

A、check amplifier board whether normal

B、all oil valve wire OV wire connection whether normal

10.2.7 can not mould close

Check and analysis: close well the safety door, press “mould close” button (if has install mould, then should chooce slow speed, avoid crash mould), check computer whether have mould close signal output.

1）if haven’t signal output ,then check

A、whether have signal input, no signal input then check outside wire circuit.

B、ejector whether return back limit, ejector haven’t return back to limit, mould can not close.

C、mould close limit confirm limit switch(target system) whether damaged.

D、if mould close condition are satisfy but no mould close signal output ,it is computer

damage.

E、plunger return back signal whether have input.

F、peripheral equipment whether have chooce, whether have allow mould close signal input.

G、core out whether has chooce, the action of target system whether normal.

2）computer have signal output, but still can not mould close, then check

A、mould close pressure whether normal(press “mould close” button and observe the pressure value on pressure meter)

B、amplifier board whether normal (during work it’s input, output signal light ON while)

C、slow speed valve whether adjust proper or damage, open /close mould valve whether adjustment improper or damage.

D、check the wire circuit between electric cabinet mould close output and oil valve whether connection normal, mould close solenoid valve coil whether normal.

E、mould close cylinder whether damaged.

10.2.8 can not mould open

Check and analysis: first should observe computer whether have input,output.

1）no signal output ,check as follow:

A、when manual, open mould signal light should light ON in computer. Other wise,should check the wire connection from open mould button to computer whether normal, if normal it is computer fault.

B、when auto, if auto choose switch wire circuit in bad connection(when injection, shake maybe lead to auto signal disconnection). Then cann’t finish a action cycle.

1）If computer work normal(have input, output), then check follow content:

A、amplifier board whether work normal.

B、the wire circuit from amplifier board to oil valve whether normal, oil valve coil whether damaged.

C、the valve core of mould open valve whether stuck .

D、mould open pressure whether normal (observe pressure meter)

E、the fixation nut between the piston rod and crosshead whether loose.

F、after mould close sudden power failure, long time also maybe can not open mould, at this moment should setting main pressure max., chooce fast speed open mould, press “charging pressure” button, then press” open mould’ button to open mould.

G、check open/close mould cylinder whether leakage.

F、open/close mould backpressure electrify ,improper adjustment

10.2.9 no injection action

Check and analysis: manual operation plunger no action, then check whether have signal output:

1）no injection signal output:

A、manual switch whether normal, under the manual mode, action signal whether have input.

B、ejector whether have return back to limit, whether have input signal.

C、machine whether under alarm condition.

2）when have output signal

A、the wire circuit from amplifier board to oil valve whether normal, each oil valve need action whether normal action, for example the reverse of valve core whether normal.

B、oil pump whether running, whether have pressure output, pressure whether normal.

C、injection cylinder damaged.

D、amplifier board whether normal work.

E、slow speed valve adjust whether proper.

10.2.10 no second fast speed injection action

Check and analysis: manual operation plunger action normal, when auto operation no second fast speed injection action. First should observe computer whether have second fast speed injection signal input, when auto mode whether have second fast speed signal output:

1）no signal input check follow content,

A、injection time whether setting proper.

B、first speed action whether normal

C、check second fast speed choose whether has choose.

D、e-coder whether count or damaged.

2）computer have signal input & output, please check follow content:

A、amplifier board whether have input/output signal to oil valve

B、oil valve coil whether normal.

C、second speed control valve whether normal, second fast speed cartridge valve whether normal

D、first fast speed strock too long, second fast speed haven't strock already.

10.2.11 injection no strength

Check and analysis: first check whether have second fast speed signal and injection whether have second fast speed, no second fast speed then it is second fast speed fault, check follow content:

1）first & second fast speed whether accord with requirement, second fast speed flow adjustment whether can normally open second flow valve.

2）fast injection accumulator N^2 pressure whether within the range of requirement.

3）injection pressure setting whether too small.

4）during plunger the injection whether have stuck phenomenon

5）whether appear leakage

10.2.12 injection lose pressure

Check and analysis: during plunger injection pressure drop, then check :

1）the oil seal on injection cylinder, piston whether wearable serious, reduce pressure valve, cartridge valve whether inner leaking.

2）shut off valve whether tighten up

3）whether $N^{2,}$ N^2 pressure not enough or N^2 pressure too high.

4）accumulator fault

5）floating piston whether craze, oil seal on flange axle whether damage and appear leakage oil ,

10.2.13 can not ejection

Check and analysis: ejection cylinder can not realize ejection action, should first observe computer have signal output or not

1）if computer haven't signal output, then check

A、whether open mould to the limit

B、if has install core pulling, core pulling whether out to the limit

C、ejection limit switch whether damaged.

D、whether has connection peripheral equipment, input signal whether satisfy action condition.

2）if computer have signal output, then check

3）A、ejector pressure whether normal(observe pressure meter)

B、amplifier board whether normal (observe ejection output indicate light on amplifier board whether light ON)

C、the wire circuit from amplifier board to the hydraulic valve whether open circuit, oil valve coil whether normal.

D、ejection oil valve whether normal, ejection cylinder whether have inner leakage phenomenon.

E、mould ejector has been stuck, ejector can not eject out.

10.2.14 hydraulic system oil temperature too high

Check and analysis: after machine continous working a period time, hydraulic system oil temperature too high (normal oil temperature 15~55℃), should check follow content

1）cool water inflow is not enough. Request water inflow accord with requirement

2）in the cooler fouling too much , haven't clean

3） oil tank hydraulic oil storage volume lower than the min. Oil level.

4） Hydraulic system have inner leakage phenomenon

5）cooler water enter into/ flow out inversely connect, poor cooling effect

10.2.15 cylinder leakage

Oil cylinder leakage is one of the oil cylinder come into all kinds fault.

Oil cylinder leakage include outer leakage and inner leakage two kinds condition. Outer leakage is oil cylinder body and cylinder cover,cylinder bottom, oil port, vent valve, buffer valve, cylinder cover and piston and so on outer leakage. It can directly observe from outside. Inner leakage is the pressure oil of cylinder inner high pressure chamber leakage to low pressure chamber. It happened at piston and cylinder wall, the joint of piston inner bore and piston rod. Inner leakage can not directly observe, need from the unilateral ventilation with pressure oil,after piston stop at some point or terminal, observe another oil mouth whether oil leak, to confirm whether there is internal leakage， no matter is outer leakage or inner leakage, the leakage reason mainly is seals not well, joint combined with bad caused, secondly cylinder pressure expansion cause internal leakage and , there are welding structure of the oil cylinder ,welding bad cause outside leakage.

Chapter 11 machine spare parts

11.1 easily damaged parts table

Series no.	Parts drawing no.	name	specification	quantity	remark
1		sleeve（1）	¢50	1	
2		sleeve（2）	¢60	1	
3		sleeve（3）	¢70	1	
4		plunger（1）	¢50	1	
5		plunger（2）	¢60	1	
6		plunger（3）	¢70	1	

Specification will be subject to customer's actual configuration, above information only for reference！

11.2 seals table

ZLC300 die casting machine seals				Clamping cylinder part	
O-ring	G35		1		Clamping cylinder piston rod
	G70		2		Guide sleeve
	G80		2		Front rear cylinder cover
Glyd ring	GS55044-0900		1		Clamping piston
Step seal	GS55013-0560		2		Guide sleeve
Dust seal	Φ56*Φ64.6*5*5.3		1		Guide sleeve
ZLC300 die casting machine seals				Ejection cylinder part	
O-ring	G40		1	cylinder piston rod	
	G110		2	Back rear cylinder cover	
Guidance tape	9.7×2.5			Ejection cylinder bronze bush	
Seal kit	DAS100-075		1	Ejection piston	

Oil seal	UHS56		2	Ejection cylinder bronze bush
Dust seal	DH56(56*64*5)		1	Ejection cylinder bronze bush
ZLC300 die casting machine seals				Injection part
Step seal	GS55013-0700		2	Injection piston rod bronze bush
Hole use SPGO	GS55014-1000		2	Injection piston rod
Guidance tape	9.7×2.5		1.98m	Injection piston rod
Dust seal	GHM275322		1	Injection bronze bush cover
Hole use SPGO	GS55044-1000		1	Floating piston
hole use SPGO	GS55044-1400		1	Pressurize piston
Shaft use step seal	GS55043-0750		1	Pressurize flange
Hole use SPGO	GS55044-1800		4	Gas bottle piston
O-ring JISB2401	P9		9	
	G25		3	
	G30		1	
	G40		2	
	G45		4	
	G55		2	Pressurize piston rod, pressurize gas bottle top cover
	G105		1	
	G95		1	Injection piston rod bronze bush
	G170		2	Fast injection gas bottle top cover, fast injection bottom cover
	G150		2	Injection cylinder
	G175		2	Pressurize cylinder bush
ZLC300 die casting machine seals				03.3 lifting part
Seal Group	DAS060-044		1	Lifting piston rod
Oil seal	UHS45		1	Lifting cylinder front cover
O-ring JISB2401	G70		2	Lifting cylinder rear cover, lifting cylinder front cover

Wear ring	2.5*15*150			Lifting cylinder front cover

11.3 ZLC300 hydraulic system spare parts table

Series		name	model	remark
1	A1	Oil absorption filter	FSX-400*80F	
2	A2	Double vane pump	2520V-14-A-M-11-1-DD-R	vickers
3	A3	motor	Y160L-4	
4	A4	Basic plug-in component	Φ25	
5	A5	Damping plug-in component	Φ25	
6	A6	Unloading overflow valve cover		
7	A7	Solenoid valve	DSG-01-2B2-D24-50	
8	A8	Proportional overflow adjust speed valve调速阀	EFBG-03-125-C	
9	A9	cooler	SL-522	
10	A10	Solenoid valve	DSG-01-3C2-D24-50	
11	A11	Solenoid valve	DSG-01-2B2-D24-50	
12	A12	Basic plug-in components	Φ25	
13	A13	Basic plug-in components	Φ25	
14	A14	Electrohydraulic valve	DSHG-04-3C2-R2-T-D24	
15	B1	Solenoid valve	DSG-03-3C2-D24-NI-50-L	
16	B2	Solenoid valve	DSG-03-3C4-D24-NI-50-L	
17	D1	Manual reversing valve	DMG-01-3C-2-10	
18	E1	Solenoid valve	DSG-03-2B2-D24-50	
19	E2	plug-in components	Φ40	
17	E3	plug-in components	Φ25	
21	F1	Reduce pressure valve	RG-06-H-22	
22	F2	Right-angle one-way valve	CRG-06-04-50	
23	F3	Electro hydraulic valve	DSHG-04-3C4-R2-T-D24	

24	F4	In-line check valve	CIT-06-04-50	
25	F5	In-line check valve	CRG-06-04-50	
26	F6	Solenoid valve	DSG-01-2B2-D24-50	
27	F7	Solenoid valve	DSG-03-2B2-D24-50	
28	F8	Fast injection accumulator		
29	F9	Throttle cut-off valve	DVP8S10M	
30	G1	reduce pressure valve	RG-06-H-22	
31	G2	Right-angle one-way valve	CRG-06-04-50	
32	G3	Stacking throttle valve	MSP-01-C-30	
33	G4	stacking sequence valve	MHP01-M-B-N	
34	G5	Solenoid valve	DSG-01-2B4B-D24-50	
35	G6	Electro-hydraulic reversing valve	4WEH10-D-4X-6A-G24-T	
36	G7	Hydraulic control one-way valve	CPG-06	
37	G8	Pressurize accumulator		
38	G9	Throttle cut-off valve	DVP8S10M	

Chapter 12 technology drawing