LOG machinery

INJECTION MOLDING MACHINE

Instruction Manual

宁波创基机械有限公司

NINGBO CHUANGJI MACHINERY CO.,LTD

Preface

Thank you very much for you purchase of the LOG Injection Machine.

This instruction manual is one section of the product.
This instruction manual provides detailed instructions for safe operation of the machine.
To allow the machine display its full productivity and performance.

Please read this instruction carefully after the machine is put into operation. Then provide proper handling and careful maintenance.

It is remember that safety team in the “safety warning” page in order to avoid danger of person and machine by fault.

Attention: --safety information

Note: --pay special attention

SAFETY WARNING

The machine must be grounded.

Each switch button must be at correct position before starting machine.

Do not touch live electricity parts after starting machine.

Check main cable often, if cover of main cable has expose, broken and dehisced, must be changed.

To ensure switch off power supply of machine when you maintain.

To sure ground terminal of main electrical box connect with earthing cable lie hidden in the earth.

The resistance of earthing cable must fit requirement specified, and the earthing cable must be laid as requirement specified.

Check earthing cable and earthing terminal often.

Note:

Be caring for firing when cleans the oil boxes by gasoline, otherwise, it should occur dangerous to you or detonate the machine.

Do not fire before the gasoline have not emanated completely as finished clean.
You must be attention not to fire after open machine's package, because the oil box of machine has cleaned by gasoline before the machine leave factory.

Do not allow changing or removing the safety devices
The safety devices equipped in the machine are good help you or your conducts made.
The machine should be operated at normal state and safety devices work well.
Do not allow changing or removing the safety devices, but our company is irresponsible for in case of fault of machine in accident.

You must operate the machine only at operation area; never allow operation other any place.

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4. Starting Operation

5. Machine maintenance

6. Assembly

7. Injection Parameter of Thermoplastic plastics

8. Causes and trouble shootings for some Injection molding defects

9. Attachments

Chapter 1 Technical parameter and structure

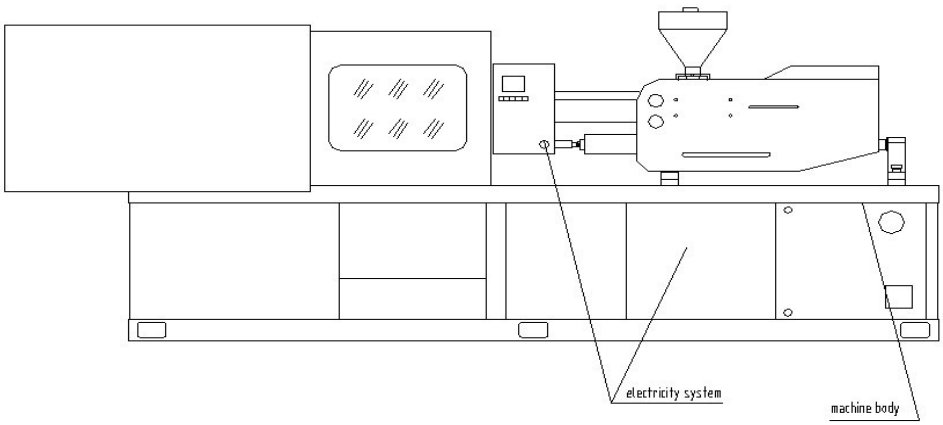
1.1 Main parameter table

See appendix 1.

1.2 Structure of machine

The injection machine is made of five units that are clamping unit, injection unit, hydraulic system, electricity unit and machine body.

See Fig.1-1. and main parts of each unit see Fig.1-2.



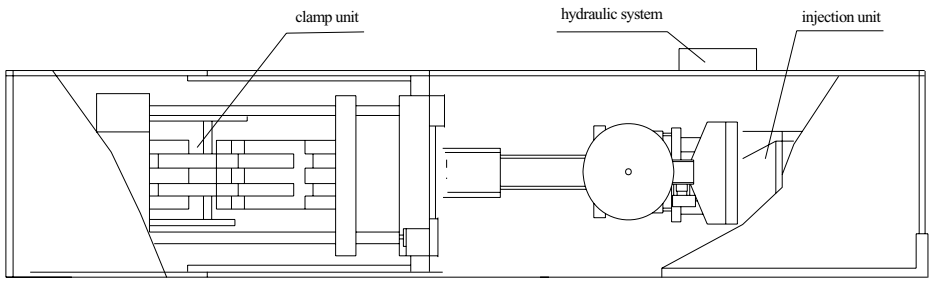
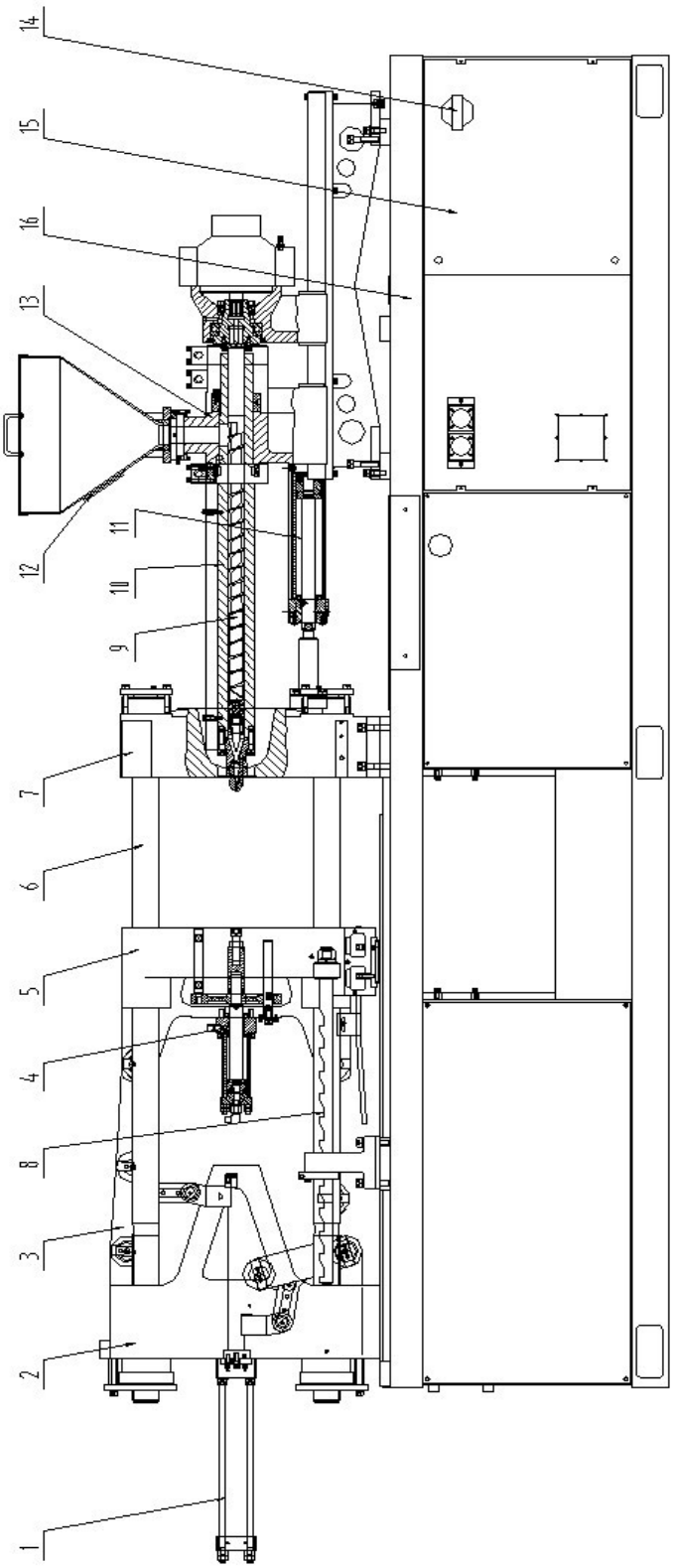


Fig. 1-1



1.clamp cylinder 2.back mould 3.link structure 4.eject cylinder 5.moving mould

6.tie bar 7.fixed mould 8.mechanical lock 9.screw 10.barrel 11.carriage cylinder

12.hopper dryer 13.injection cylinder 14.air switch 15.electrec control 16.machine body base

Fig.1-2

1.3 Working principle

The injection machine is controlled to run by special computer and each action is driven by hydraulic. The machine can be worked by “manually”, “semi automatically” or “automatically” operation through hydraulic and electric control.

Manual operation:

The machine is manually operated.

Semi automatic operation:

Each action of the process is done automatically according to the specified program until a cycle finished after closing the safety door.

Automatic operation:

The computer controls the machine action program; each action of process is automatically done in cycle.

Automatic operation has two kinds of sensor full-auto and timing automatically.

Caution:

The machine shall be checked to ensure the safety devices works well before manual or semi-automatic operation.

During an operating cycle:

● Working process of the Injection Unit:

Plastics go into the barrel from the hopper;

The screw turns and the plastics are kneaded and extruded, producing and heating, which, together with the externally barrel, melts plastics;

The melted plastics accumulated at front end of screw and driving screw backwards until there is a certain amount of melted plastics;

The injection cylinder pushes the screw forwards and injects the melts plastics at the front end of screw into the mould.

● Working process of the Clamping Unit:

Driven by the clamping cylinder, the moving platen moves forward rapidly,

The moving platen slows down to clamp with high pressure when it is close to the mould,

Injection and cooling,

Mould open slowly,

Open mould to the required position.

Injection and clamping are done alternately to constitute an operating cycle. All these actions are performed by hydraulic system under the computer control.

1.4 Mold Clamp Installation dimension

See appendix 2.

1.5 Preparation before Purchase

1.5.1 How to order spare parts

When you intend to purchase spear parts, please provide the following information:

To sure the model, serial number and shipping date of your machine selected.

Code of the spear parts, location and ref. Number in the drawing of the Manual and Quantities, they can be found in chapter 9.

You can buy the spear parts directly in the stores or nearby offices of HAITAI Machinery.

The model, serial number and production date of the machine can be found on the nameplate of machine.

In case that component you need is not listed in the Manual or different from the manual, please provide the manufacturer name and code number.

1.5.2 Selection & Specification

1.5.2.1 Calculate the injection capacity of the injection molding machine according to the weight of product

If the product is made from polystyrene, the injection capacity Wps shall be

Wps=(product weight + total weight of the runner system) / (0.75～0.90)

i.e. Wps=(1.3～1.1) × (product weight + total weight of the runner system)

The larger coefficient is taken when high precision product quality is required.

If the product is made from other plastic (named X plastic), calculate the theoretic injection capacity of the plastic, Wx, based on the aforesaid formula:

Wx=(1.3～1.1) × (product weight + total weight of the runner system)

But you can't decide the injection capacity of the injection-molding machine simple by Wx, you have to exchange it into Wps. The formula is:

$$Wps = Wx \times \frac{1.05}{Vx}$$

In which, Vx represents the specific gravity of certain plastic.

For example: Suppose a plastic product is made from polyethylene (PE), its weight is calculated to be 185g, and the weight of runner system is estimated to be 20g, according to the aforesaid formula:

Wx = 1.2* (185+20) =246g

The specific gravity of PE Vx =0.92

So , $Wps = 246 \times \frac{1.05}{0.92}$

The machine with HTW1600 is recommended.

1.5.2.2 According to the perpendicular projection area of the product on the platen, calculate the clamping force P:

Clamping force=clamping force constant × projection area of the product

i.e. p = Kps

In which, P---- clamping force (t)

S---- perpendicular projection area on the platen ($cm^{2)}$

Kp---clamping force constant (t/cm^2)

Kp is listed in the following table 1

1.5.2.3 The space between tie bars of the machine is dependent on and larger than the external size of mold.

Table 1 clamping force constant Kp (for precise products)

Plastic Description	PS	PE	PP	ABS	NYLON	POM	Fiberglass	Other Engineering Plastic
Kp (t/cm^2)	0.32	0.32	0.32	0.30	0.64～0.8	0.64～0.8	0.64～0.8	0.64～0.8

1.5.2.4 The opening stroke of the injection molding is dependent on and larger than the height of the product.

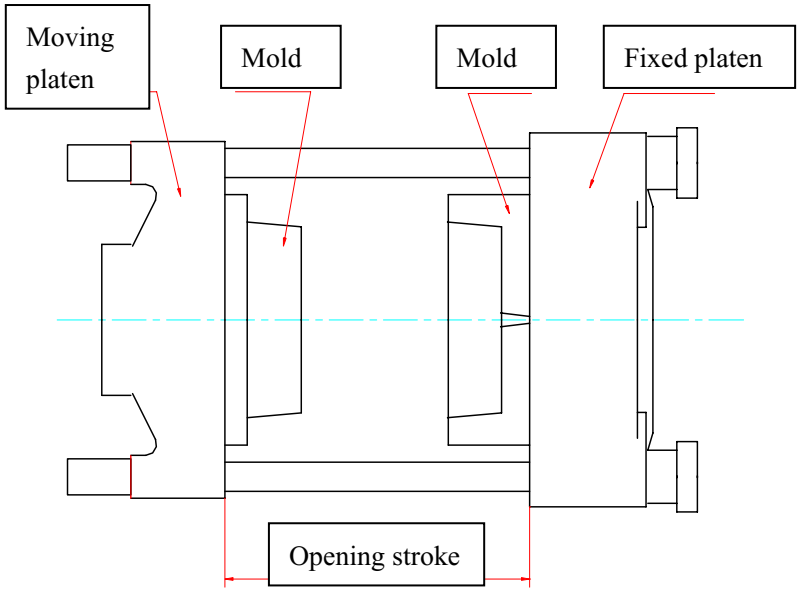


Fig.1-3

1.5.2.5 Other secondary considerations

The mold thickness of the injection-molding machine shall match you mold height.

Ejector stroke, ejection force.

Technical data.

The dimension, the material feeding become difficult, even worsts no feeding to effect an operation.

Chapter 2 Machine Installation

2.1 Preparation before Installation

2.1.1 choice of hydraulic oil and lubricating oil (grease)

Hydraulic oil and lubricating oil are very important for the operation of injection molding machine, so the user shall observe the requirements strictly for purchase and application of them. Table 2-1 shows the recommended hydraulic oil, lubricating oil and grease.

The hydraulic oil and lubricating oil must be chosen carefully; otherwise, you cannot fully utilize the excellent performance of the machine.

Not to make environmental pollution while using hydraulic oil and lubrication oil.

Table 2-1 recommended hydraulic oil and lubrications

BRAND	SHELL	MOBIL	ESSO	FEOSO	CHINA (AREA)
Hydraulic oil	TELLUS46	DTE25	TRERSS046	HYDROSO46	N46 Anti-wear Hydraulic oil
Lubricating oil	TONNA T68	VACTRA OIL HEAVY MEDIUM	MILLCORK150 Or TERESS068	HYDROSO100	Machine oil N220 (for southern area) N100 (for northern area)
Grease					Lithium base Grease

2.1.2 electricity and cooling water

First, the user should get the required power supply and cooling water ready.

You may, according to the data of instruction, generally determine the power supply, source and layout of the cooling water. As the machine may be different in some way from the oral or written descriptions provided by us, the user shall make proper changes of the power supply and water source while installing the machine.

If necessary, accessories are required for a suitable cable and pipe installation.

2.2 Lifting machine

Check whether there is something damaged with the machine and whether it is confirmation in good conditions before lifting.

If the machine gets damage during transportation, be sure to report in time and make a record.

It shall be noted that during the storage and handling of the equipment, the allowable ambient temperature to the equipment is between -25℃and 55℃;in case the temperature has to be exceeding 70℃, the equipment shall be not exposed to such temperature for more than 24 hours.

The equipment is large and heavy. The following points shall be noted in lifting:

※ For the safety and stableness in the process of lifting, please refer to Fig. 2-1.

※ The crane must have sufficient lifting capacity;

※ The pulling cable should be tied according to the specified position shown as Fig. 2-1 any other part of machine mustn't be tied in order to protect the machine;

※ The steel cable and hook must be strong enough and damage –free (see machine weight in the table 2-1);

※ The machine should be protected to prevent any scratched or other damages.

※ Please make reference to Fig.2-1 when the equipment is handled with forklift. The primary requirement is a forklift of sufficient capacity to ensure the balance when handling, and no tilting shall occur to ensure the safety and stabilization when handled up and downward.

※ A wooden pallet recommended is placed under the equipment to facilitate the handling with forklift.

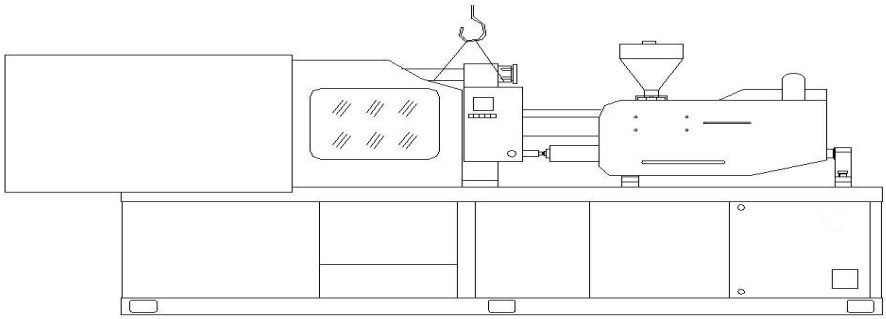
※ In case no such pallet is available, some soft material shall be padded under the equipment to avoid scratching.

※ It is shall take care during handling operation. The handling point shall be on the center of gravity of the equipment.

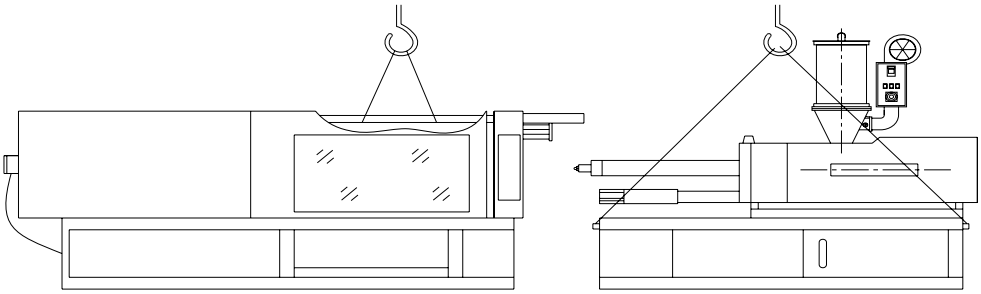
※ The lift personal should be qualified.

※ All the exposure parts, such as leaders, tie-bars and surface of platens should be wiped antirust before transporting.

Caution: Do not remove antirust oil with impregnant, use soft material such as paper or clothes only.



LOG130-LOG400



LOG500-LOG650

Fig.2-1

Table 2-1 Machine weight unit：kg

Molde	Weight
LOG90	3500
LOG130	4600
LOG160	5300
LOG210	6800
LOG250	8000
LOG300	11000
LOG320	13000
LOG400	17000
LOG500	22000
LOG650	36000

2.3 Installation and commissioning

2.3.1 Installation foundation

If the machine will be installed on a concrete base, make sure that it's strong enough.

Leveling pad can be also be used for the purpose of leveling as well as a vibration absorbent.

See appendix 3.

Notice ：

Keep machine's circumference clean.

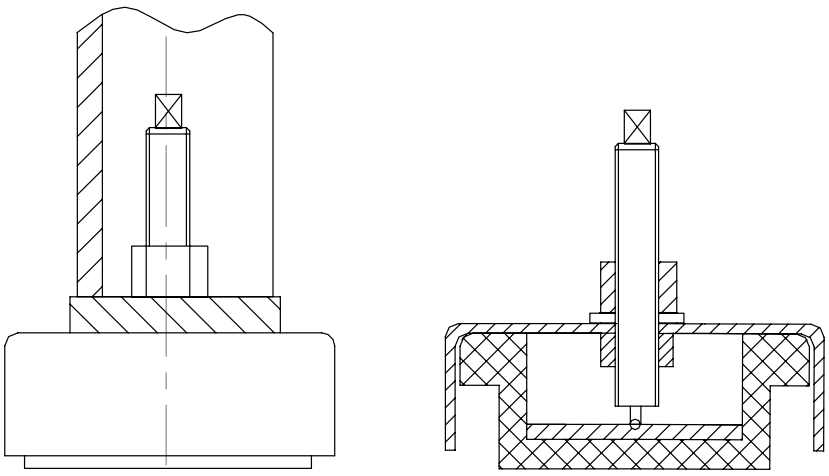


Fig.2- 3 adjustable iron plate

Refer to the clause 2.3 to use foundation bolts to fix the machine on an intensified concrete floor.

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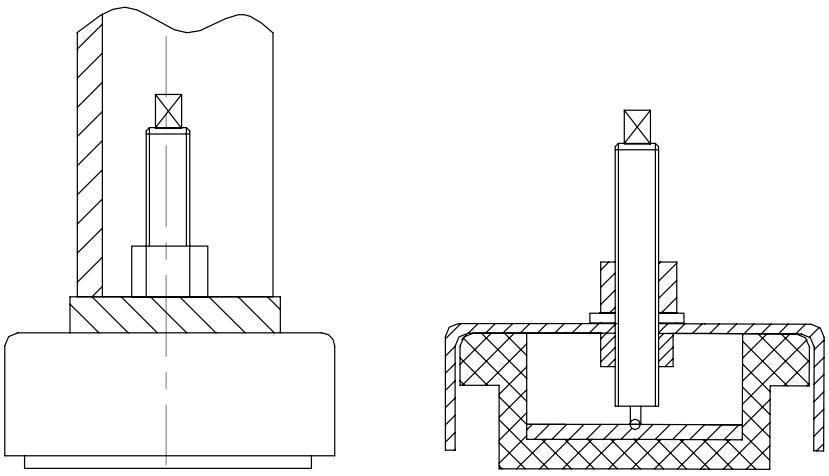

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2.3.3 Hopper Dryer

2.3.3.1 Installation

The dryer has been fixed on the injection molding machine before leaving factory.

2.3.3.2 Connecting the power source

Open the distribution box and connect the power source in accordance with wiring diagram. Notice should be taken concerning if the power voltage is in compliance with the required specifications, also if the switch and load are proper and safe. Also switch on the blower to check if it turns in right direction.

Notes: Before connecting, the main switch and heat switch should be off.

2.3.3.3 The dryer test

After all wires are connected, turn on the main switch and the heater switch, then the pilot lamp light, to see if the roating direction of blower is the same as the direction of arrow head, if not, exchange any two of cables.

2.3.3.4 Setting temperature

Refer to the drying temperature table of plastic materials and set the scale of the temperature regulator from 0~199℃. After heating some time, the yellow and red pilot lamp light in turn, means that it has gotten the setting temperature, meanwhile observe the temperature of controller is in accordance with the temperature on the temperature meter. The error is ±2℃.

Notes: When setting temperature must refer to the drying temperature of plastic material, when temperature is too high, the material on the shade separator will agglomerate which tends to cause machine failure. The actual experience will help you for proper adjustment on temperature.

The drying temperature table of plastic material

Raw material	Dry temp.		Dry time
ABS AS	830℃	176° F	2.5H
PE PP	90℃	194° F	1H
PU	90℃	194° F	2.5H
PA	75℃	167° F	5H
PC	120℃	248° F	2.5H
PPT	130℃	266° F	2.5H

2.3.3.5 Setting timing

Before turning on all the switch, turn the timing switch on, take the transparent lid down, and shift the small black switch on top left of timer to be Auto. Adjust the voltage frequency switch

on top right to required voltage frequency, then set current time and drying time, at last cover the transparent lid. The dryer will be work automatically.

2.3.3.6 Operation

See the operation instruction of the hopper dryer.

2.3.3.7 Service and Maintenance

Clean the blower and the air vane periodically to avoid damage to blower. Observe and test if the shade separator and screen separator has twist and transmutation.

2.4 Hydraulic oil

The machine has hydraulic oil in its tank. Make the oil reach the upper limit of the oil level gauge and make sure the filled oil is same as the hydraulic oil in the tank. To ensure normal operation of the machine, the oil can only be filled into the tank after being filtered. See Fig.2-5.

Caution:

Recheck the oil level after starting the machine and fill the oil when insufficient.

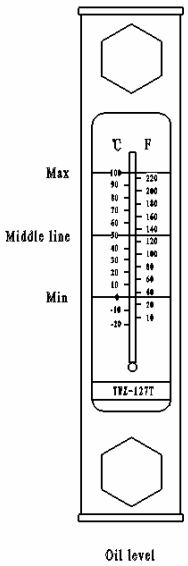


Fig.2-5

Different types of hydraulic oil can't be mixed; otherwise it will deteriorate all the hydraulic oil.

Please contact us if you have any question.

2.5 Cooling water pipes connection

2.5.1 Pressure of Cooling Water

Generally speaking, the water pressure ranges between 0.5 and 1Mpa and can lower in case water tower is available.

2.5.2 connection of cooling water pipes

The cooling water for oil cooler, mold barrel is separately comes from the cooler and the water supply rack or comes from an alternate cooling water source, which can be connected by users to meet their special needs. Refer Fig.2-6 for the connection of cooler and water supply rack.

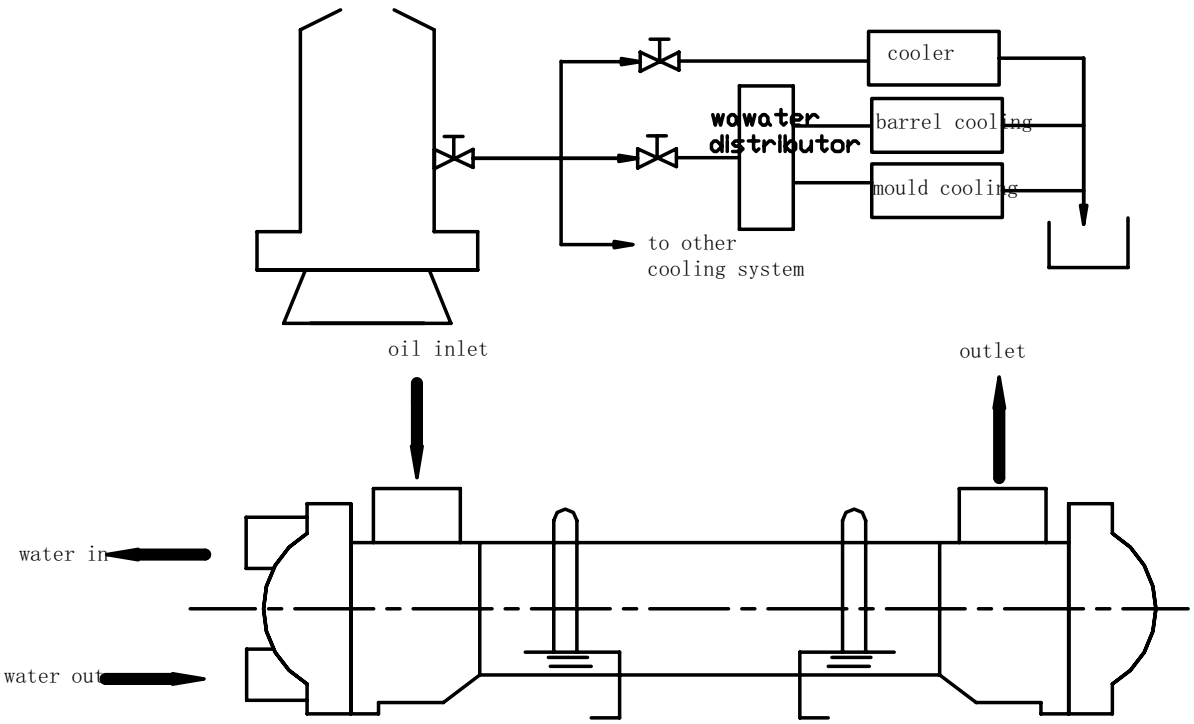


Fig.2-6

Refer to theFig.2-6 to connect the cooling water inlet and outlet pipe. connecting ：

Inlet port of cooler： Rc1”

Outlet port of cooler： Rc1”

Inlet port of mold： Rc1”

Outlet port of mold： Rc1”

Soft rubber tube with valve is recommended to adopt.

Permitted hydraulic pressure (MAX.): 8bar

The pressure difference between inlet and outlet should be ≥3bar

To guarantee enough water.

Notice ：

Cooling water must be clean.

Cooling water not filtered which directly come from river or other source can cause cooler jam.

2.5.3 Cooling water wastage for oil cooling (litre / min)

The consumption of cooling water depends on the moulding condition. When the water volume consumed by mold is not considered, the total cooling water is approximately table 2-2. the actual water consumption shall include the amount consumed by the mould. Of course, the water temperature, air temperature and dirt in the cooler will affect the cooling efficiency and other attributes.

Table 2-2 about cooling water wastage for oil cooling (L/min)

temperature at inlet	15℃	20℃	25℃
wastage	35	45	50

2.5.4 Caution

As it is very cold in winter (especially in northern area), the cooling water shall go on circulating under relatively lower pressure after the machine stops running. At night when the cooling water is likely to freeze, the water in the cooler shall be discharged, and using compressed air to protect the cooler and other devices from damages shall further discharge the residual water. Furthermore, the cooling water shall be kept clean.

2.5.5 cooling water capacity (L/min)

Motor power	Water Flow ratio	Motor power	Water flowing ratio
7.5kW	13 litre/min or more	55kW	94.5 litre/min or more
11kW	19 litre/min or more	75 kW	129 litre/min or more
15kW	26 litre/min or more	90 kW	155 litre/min or more
18.5kW	32 litre/min or more	110 kW	190 litre/min or more
22kW	38 litre/min or more	135 kW	234 litre/min or more
30kW	51.5 litre/min or more	155 kW	269 litre/min or more
37kW	63.5 litre/min or more	220 kW	383 litre/min or more
45kW	77.5 litre/min or more	330 kW	576 litre/min or more

Note: the oil temperature in tank do not exceed 55℃

2.5.6 Water cooling capacity for mold and screw（L/Min）

Heater power	Cooling Water	Heater power	Cooling water
6 kW	**10.5** litre/min or more	**35** kW	**60.0** litre/min or more
7 kW	**12.0** litre/min or more	**40** kW	**69.0** litre/min or more
8 kW	**13.5** litre/min or more	**45** kW	**77.5** litre/min or more
9 kW	**15.5** litre/min or more	**50** kW	**86.0** litre/min or more
10 kW	**17.5** litre/min or more	**55** kW	**94.5** litre/min or more
15 kW	**26.0** litre/min or more	**60** kW	**103** litre/min or more
20 kW	**34.5** litre/min or more	**90** kW	**155** litre/min or more
25 kW	**43.0** litre/min or more	**110** kW	**190** litre/min or more
30 kW	**51.5** litre/min or more	**170** kW	**290** litre/min or more
		270 kW	**460** litre/min or more

2.6 Electric wiring

2.6.1 Protective Earthing

The specified type LOG series machine must do the earthing according to the earthing indications in the way determined.See Fig.2-7. Power supply system see Fig.2-8, the natural conductor and protect conductor is separated in the system.

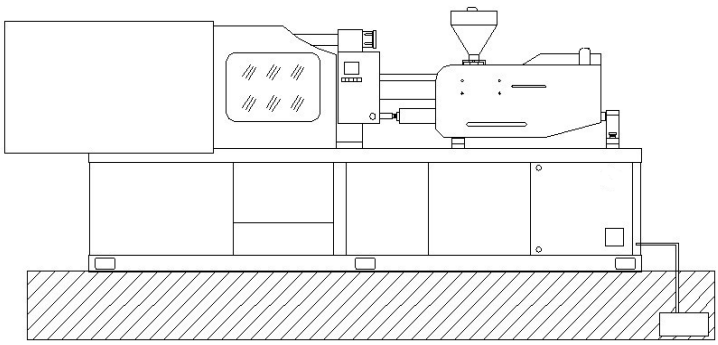


Fig.2-7

Table 2-3 Grounding cable section as flowing:

Motor power	Grounding cable section
15KW or below	16mm^2
15KW—37KW	22mm^2
37Kw or more	38mm^2

When the earth resistance is more than 4Ω, the earthing must be repeatedly connected with the closest standard earth body to reduce the earth resistance to or less than 4Ω for purpose of personal safety.

2.6.2 Connecting power supply cable

After connecting the safety earth, check the components and cable to see if they are loosened or danger during transportation. Only when good condition is confirmed the three-phase, 380V and 50Hz frequency can be supplied. The electric power consumed by the machine is as table 2-4. It must be noted that the diameter of electricity line for general power supply cannot less than be a value, otherwise the temperature of electricity line may be higher, the required cross section of electricity line is as table 2-4. The 3-phase power cable shall be connected to the tripolar breaker, which is located inside the electric control panel while the neutral power cable shall be connected to the side terminal bank where neutral line is marked. Refer to Fig. 2-9.

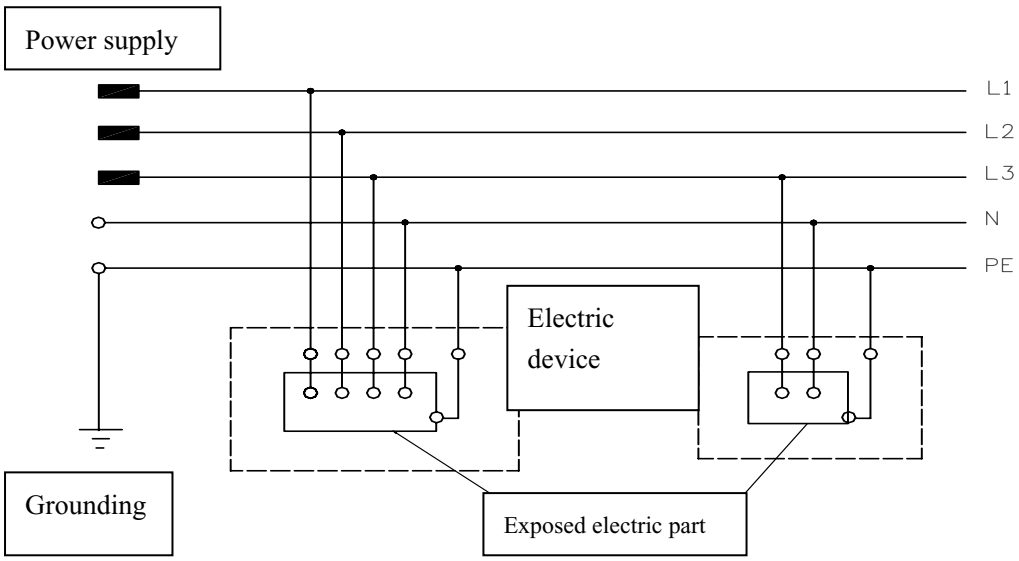


Fig.2-8

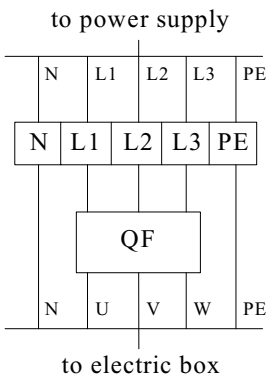


Fig.2-9

table 2-4 unit：mm^2

Model	Phase wire	PE wire
LOG90	6	6
LOG130	6	6
LOG160	10	6
LOG210	10	10
LOG250	16	10
LOG300	16	10
LOG320	25	16
LOG400	35	25
LOG500	35	25
LOG650	35	25

The grounding of 3-phase power cable shall ensure motor driving pump rotates in correct direction. (Remember: the oil pump can only be started after the oil tank of the hydraulic system is filled with sufficient and applicable oil).

2.6.3 cable color

The cable color see table 2-5

Table 2-5 of cable color

Cable sort	Cable color
Cable for connecting motor, air circuit breaker, heating and transformer (380V)	**Black** (BVR2.5mm，4mm，6mm，10mm，16mm，)
Heating zero cable	**White heat**(2.5mm ，4mm，6mm，10mm)
220Vcable for contactor, controller switch	**Red** （BVR 1mm）
24V、48V wires	**blue**（BVR 1mm ）
Grounding cable	**Yellow** （BVR 1mm BVR6mm，BVR10mm）

☞ Note: two-twist wire: red connect +24V or +48V, blue connect 0V

Three twist wire: red connect +24V, blue connect 0V, blank connect signal input.

2. 7 Commissioning

The machine has been adjusted in factory, and adjustment will be made mainly on the following aspects after installation.

2.7.1 machine body leveling adjustment

Adjust the bolts of the shockproof heel blocks and make machine horizontal after install the machine on the base.

First make to adjust Portrait level by a gradienter on the machine guide, and then make to adjust landscape direction by a level meter on machine track between the mold platens as illustrated Fig.2-10. Keep the reading and place the level in vertical direction and insert location pin, finally tighten nut.

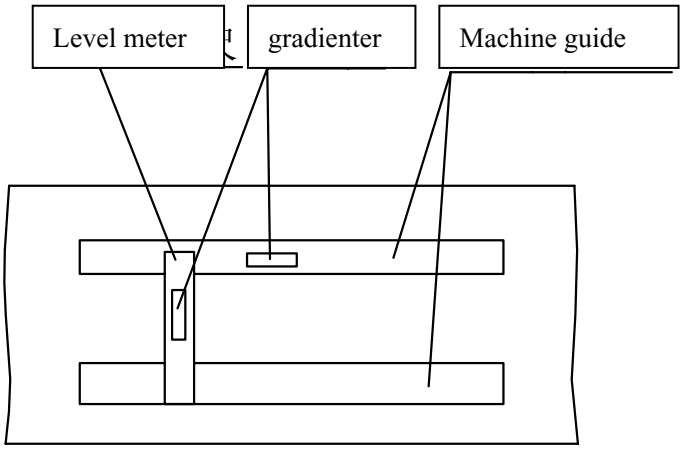


Fig.2-10

2.7.2 Test and adjust tie bar

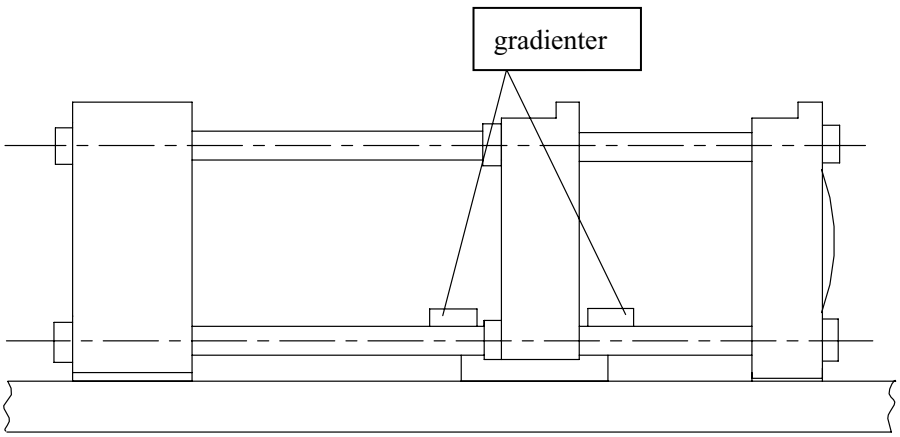


Fig.2-11

For the horizontal level of the slide way surface, the allowed longitudinal tolerance is 0.20mm/m and transverse tolerance is 0.16mm/m.

Attention!

Only after the cement consolidates, nut of concrete blots can be fastened.

After the adjustment, all the nuts on the adjustable mounts must be fastened.

In order to prevent any damage due to the groundwork, it is recommended to check the plane situation after 4 weeks of operation.

2.7.3 Central alignment of nozzles.

Measure L1=L2, L3=L4 by a vernier caliper, axiality between nozzle and mould orientation hole can be adjusted as follow See table 2-6.

Table 2-6 about requirement data of axiality

Diameter of mold location hole	Φ80~ Φ100	Φ125~ Φ250	Φ315 or more
Axiality	≤Φ0.25	≤Φ0.3	≤Φ0.4

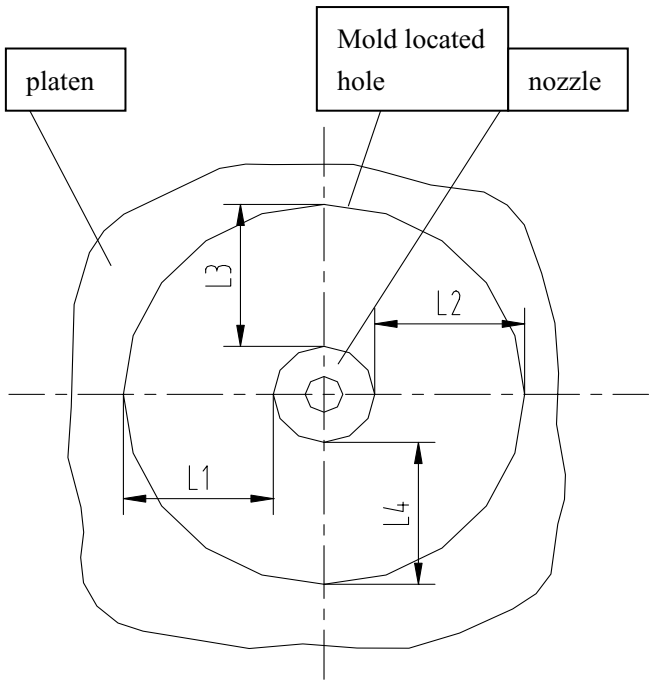


Fig.2-12

Adjustment nozzle, mold position hole and vertical level of machine body which between the two mold platens.

Unscrew the fasten screw and locking screw.

As above diagram indication, measure L1, L2, L3, and L4 by vernier caliper with 0.05mm accuracy. Adjusting it to make L1=L2, L3=L4. Tolerance of adjusting must accord with the request of the above table 2-6.

2.7.4 parallelism of mold platen

Generally, the measure descried below is sufficient to align the machine bed. If tolerance exceeds maximum permissible levels, please inform the manufacturer. See table 2-7.

Table 2-7 of Tolerance of platen parallelism

Space between tie bar available	Tolerance when clamping force is zero	Tolerance when clamping force is max.
≥200~250	0.20	0.10
>250~400	0.24	0.12
>400~630	0.32	0.16
>630~1000	0.40	0.20
>1000~1600	0.48	0.24
>1600~2500	0.64	0.32

2.8 Pump rotating direction testing

In order to observe the motor rotation direction, please provide assistance to machine testing technician. One operator would start the pump motor by pressing the pump motor start button QS, and another operator would observe the motor rotation direction. In order to facilitate the observation and avoid damage to the pump, the operator should confirm the rotation direction and press the emergency stop button immediately after the pump has started rotating. If the motor rotation direction is not correct, it is only necessary to reconnect three-phase cable (such as L1, L2 and L3) in the main air circuit breaker, and should not try to change the motor end wiring.

☞ Note: In case that the motor turns anti-clockwise and the oil pump makes noises due to no oil pressure, the oil pump will cause damage if it's keep running.

2.9 Preparations before trail operation

The parts with antirust additive should be cleaned with petrol or kerosene.

During cleaning, be aware of fire!

For the parts with hard chromium, such as tie bar and cross heads guide rod, cylinder pistons must be dust free and dirt free for the sake of protecting sealing element and chrome plating. A coat of lubricating oil is required after cleaning.

Before the operation of the machine, it is necessary to apply additional lubricating oil to the parts though they have been lubricated in the factory.

For the central lubricating systems, the lubricating pump should always keep full and checked frequently.

2.10 Check and Adjustment

When earthing is ready, all the screw, nuts and pipe connectors shall be checked, and must be tightened before operation. The electric cable inside and outside the electricity cabinet shall also be checked. In addition, if the connects are found loose or fall, they shall be tightened immediately for normal operation.

After careful and overall check, turn on and test the machine. Nobody can operate the machine before careful and overall check.

CHAPTER 3. Safety

3.1 Four Safety Caution

—Open the safety door before putting the hand into the mould.

—Shut down the pump if inspection or maintenance is carried out for the mold.

—switch off the machine whenever you go between the tow platens.

—Keep your body away from any moving part of the machine.

Attention!

The safety equipment fitted on the machine is there for you safety and that of the production of goods.

The machine should only be operated when all safety equipment is in working order.

To remove, by-pass, or make safety equipment inoperative is therefore not permitted.

The safety equipment also includes the safety program contained in the software. Don't carry out any changes to this program.

3.2 Manning and Environment Management

-Operators must be experience and qualified.

-For maintenance of safety devices, please feel free to contact our Company.

-Operators must be trained for the operations, maintenance and inspection before operating the machine. The person who has not been trained and licensed is absolutely prohibited to operate the machine.

-Operator should operate the machine in operation area. See the followed diagram.

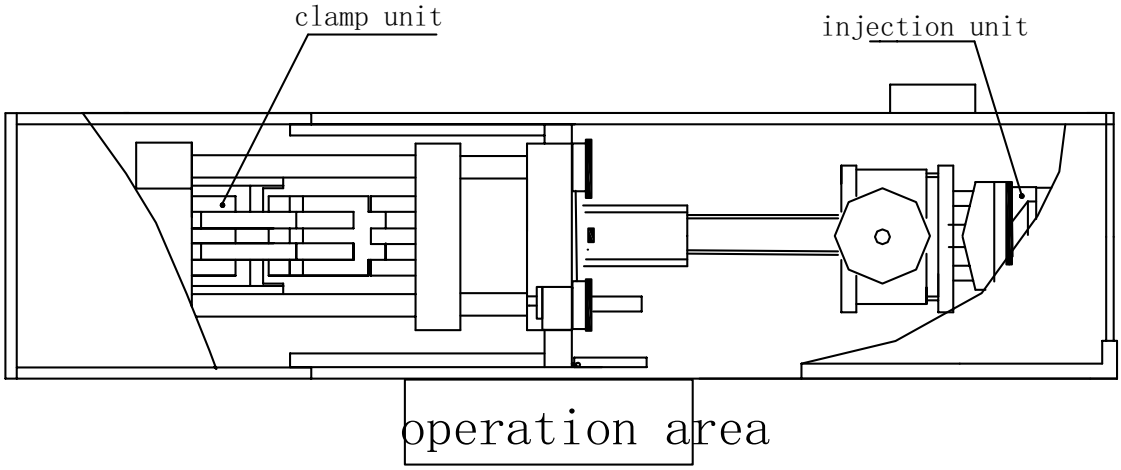


Fig. 3-1

-Ensure sufficient space between machine and wall. Confirm the water and power supply, mainly including cable specifications, fuse, grounding, water pressure and water output setting.

-Check the warning sign on the machine and put on a new one if it is found damaged or lost, make periodic inspections on the equipments.

-Clean up the water, oil and resin on the machine and its foundation immediately, if any, to avoid slide and injury.

-Keep the walkway and areas around the machine free of obstacles to avoid trip and hurt.
-Warn the person who acts dangerously.

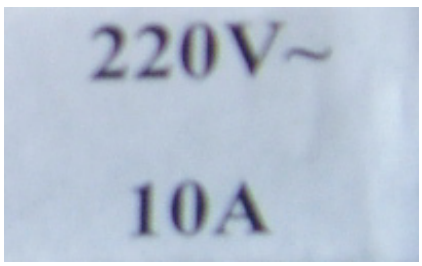
-Put the tools at the designated pace after use rather than on the machine.
-Report if any injury occurred.

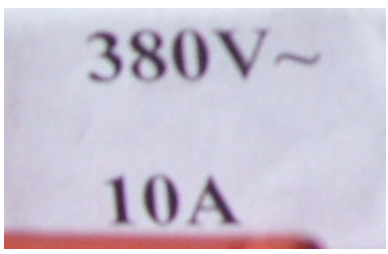
-React quickly in case of any emergency.

3.3 Machine main Safety Scutcheon

grounding

CE





on the socket

3.3.1 Noticing

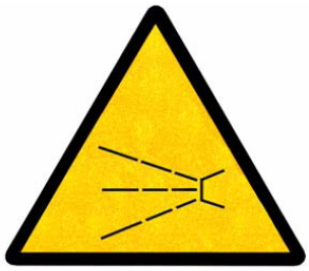
warning electric shock

on the distribution box

warning hot surface

on the cover of the barrel

prevent bespattering



injection shield

on computer hang box edge

warning hands pinching

on the front safety door

warning of mould

only on all moveable guards of the mould area

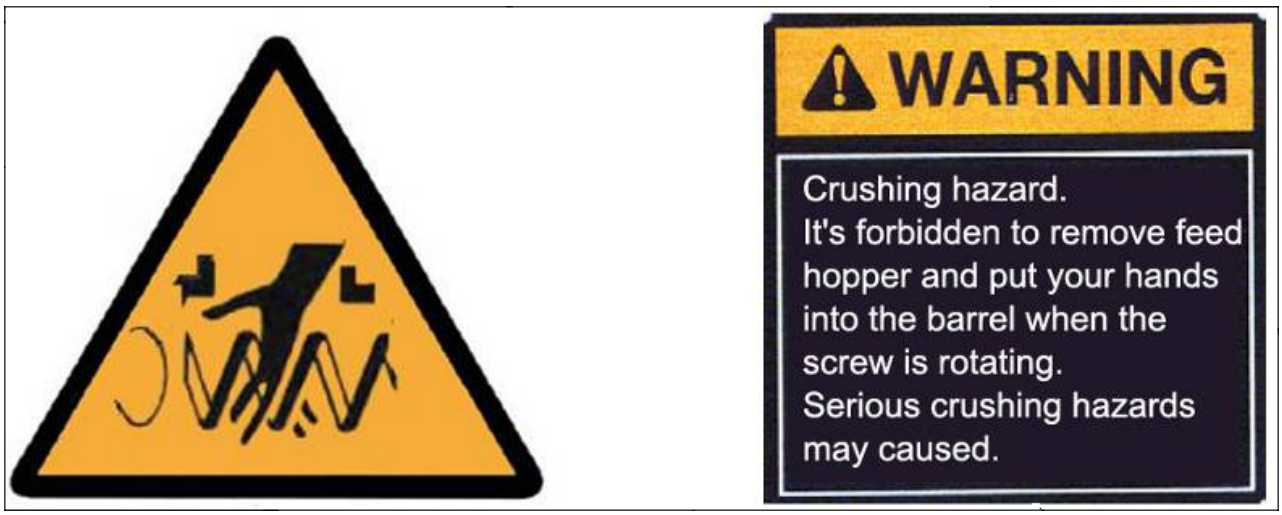
warning fall

on figure aluminum

3.3.2 prohibit

on the present stage and bars

on the machine tail

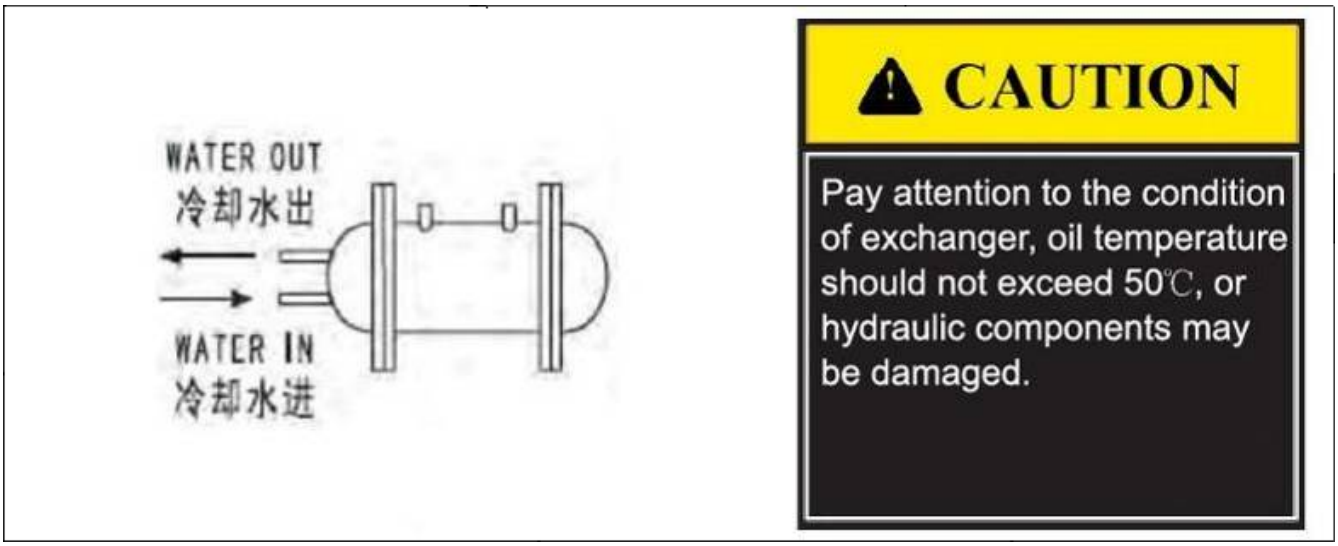


0n the hopper

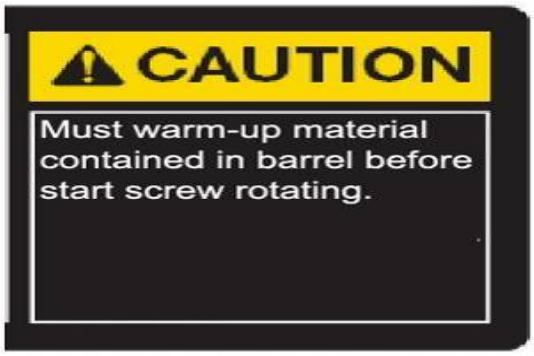
on the back safe door

on the power supply

on the connection of high pressure hoses



on the cooler

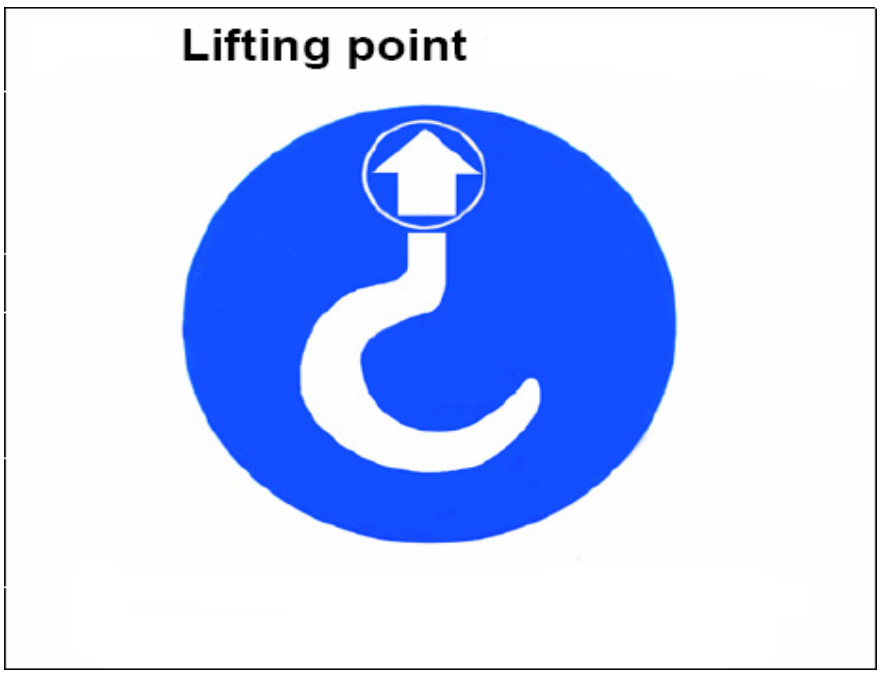


on the barrel

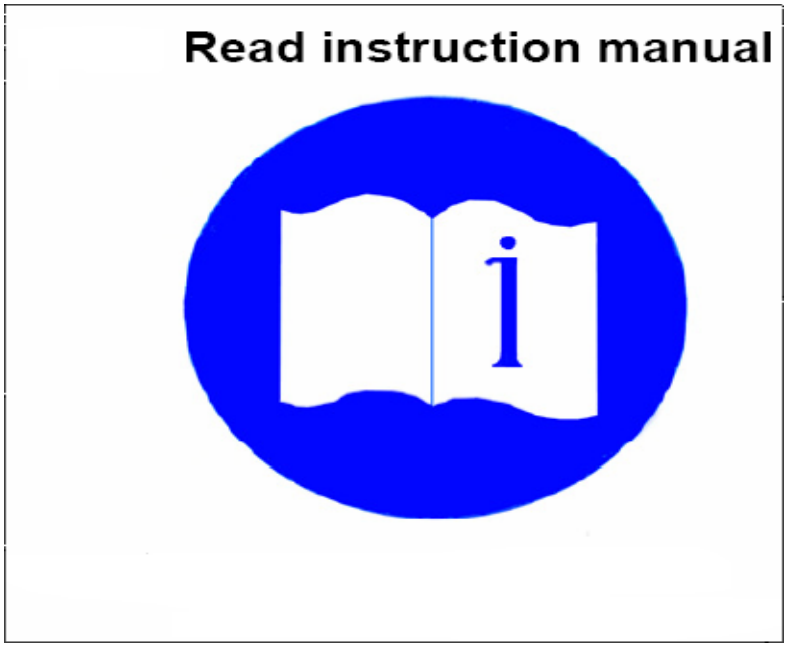
forbid trample

on cooler

3.3.2 instructions



on hoisting position



on the safe door of operator side

on the barrel shield of operator side

3.4 Electricity Safety equipment

In case of any accident or error in the process of operation, first press the emergency stop button (the red projected one on the lower right corner of the screen) as shown in fig. 3-2, and then turn off the main power supply switch as shown in fig.3-3. Find out the causes of fault and do not start the machine until all faults have been rectified.

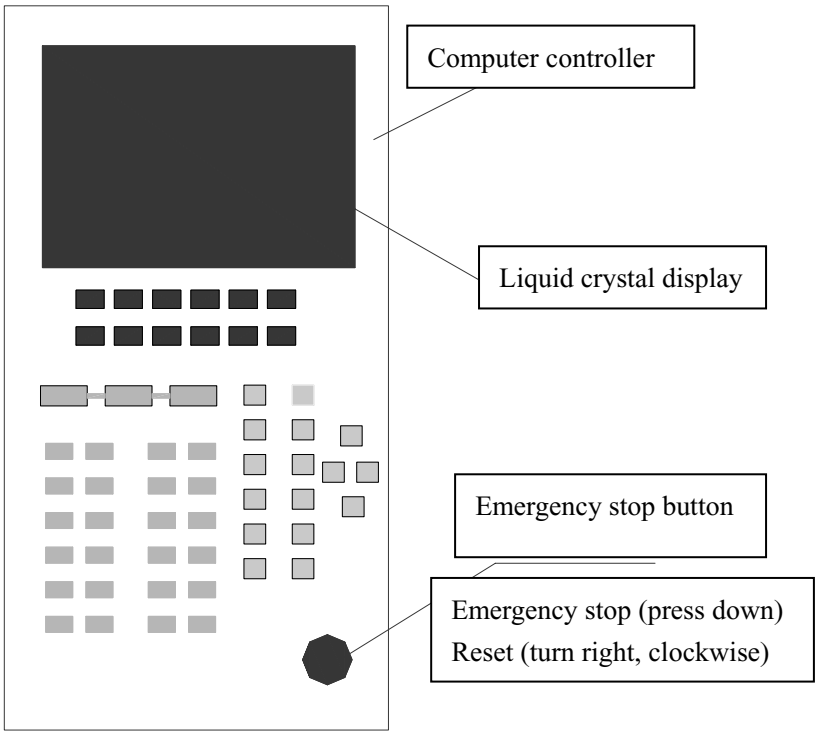

Computer controller
Liquid crystal display
Emergency stop button
Emergency stop (press down)
Reset (turn right, clockwise)

Fig.3-2

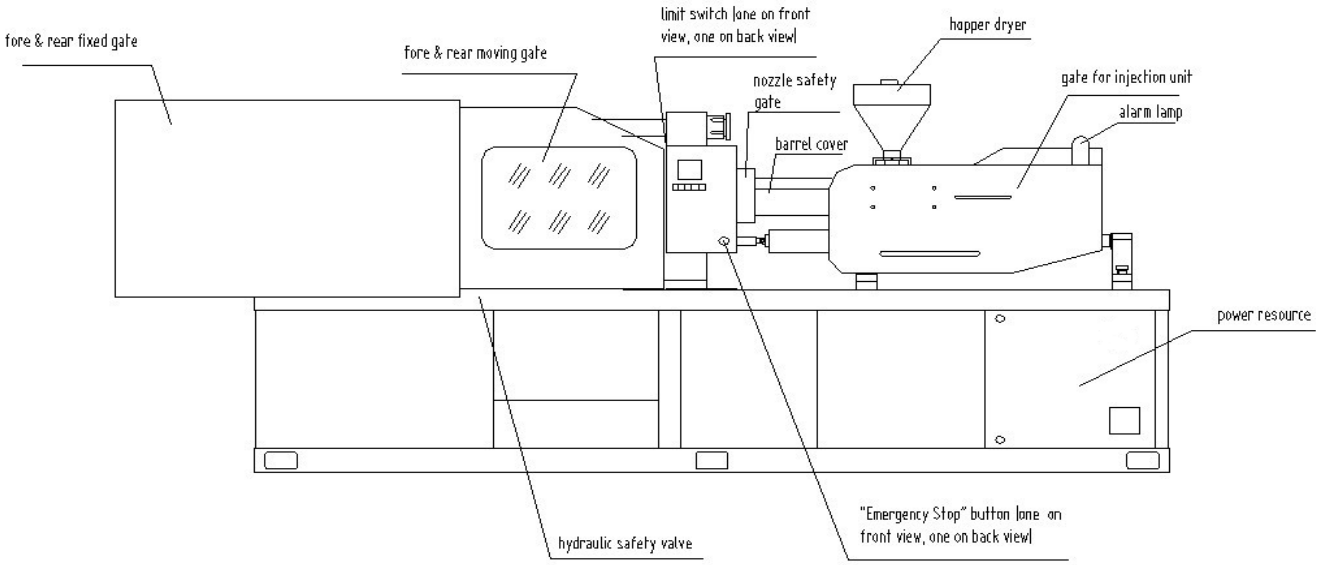

fore & rear fixed gate
fore & rear moving gate
limit switch (one on front view, one on back view)
nozzle safety gate
barrel cover
hopper dryer
gate for injection unit
alarm lamp
power resource
hydraulic safety valve
"Emergency Stop" button (one on front view, one on back view)

Fig.3-3

3.4.1 description of safety devices

The safety devices include safety door and locking-self mechanism. See above Fig.3-3.

All safety doors are very important to avoid personal to damage by splashing melted material and prevent person from dangers zone.

The locking-self mechanism will stop all damage action at any door opening.

Front safety door

It permit operation place. All damage action such as “close mold”, “nozzle forward”, and “injection” does not work until the safety door closed.

There are tow systems electricity and hydraulic to control damage running.

Rear safety door

It is monitored by limit switch S3. Once the rear safety door opened, the limit switch S3 close so clamping valve cannot work.

The moving mold is able to begin clamping after rear safety door closed.

Mechanism safety devices

This device function prevents the safety door from moving.

Safety door for nozzle

The safety door prevents personal from touching hot nozzle or sprayed melted material.

The limit switch S8 monitors the door.

Barrel cover

The cover fixed on heating ring, it prevents personal from touching hot barrel.

Fixed door

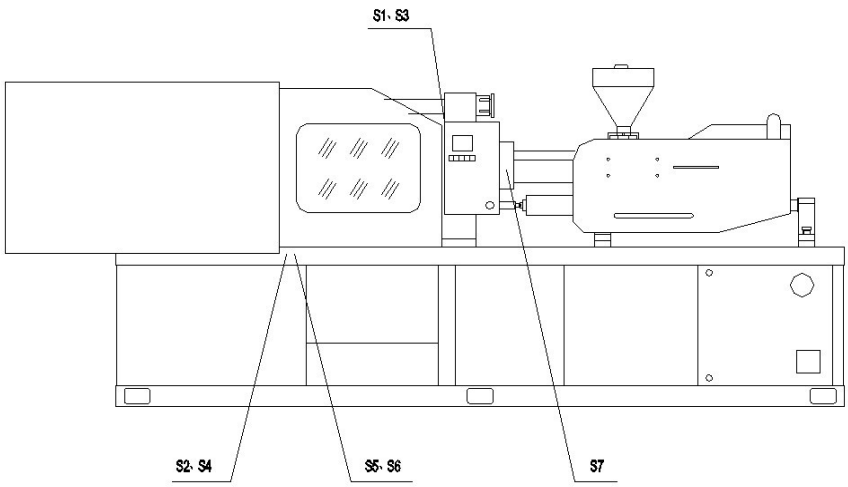
All of fixed doors have tightened by bolts. Do not remove.

Hydraulic safety valve

Client can be optional.

3.4.2 Safety door limit switch

As shown in Fig.3-4, the safety door limit switch serves to interrupt the mold closing. When the safety door is open, limit switch has been activated to break the circuit. Its dual circuit control functions of NC (Normally closed) and (normal open) can stop the motion of the machine.



S1--upper front door S2--lower front door

S3--upper rear door S4--lower rear door

S5--valve for front door S6--valve for rear door

S7—nozzle safety gate

Fig.3-4

3.4.3 Inspection Procedures for Test Run

1) Open the safety door (either the front or the back)
2) Set the computer selection button on the “manual” status
3) Press “close” button to clamp mold
4) No clamping movement indicates normal conditions.

☞ Note: Inspect the front and back safety doors separately. After opening any of them indicated normal conditions, cannot work any action, otherwise turns off the power supply immediately. If you have any problem contact us.

3.4.4 Periodical Inspection

Make sure that the safety doors can be opened and closed smoothly.

Check whether the safety doors (such as door, slide way and roller) are in good condition.

Make clear the correct configuration such as safety gate, limit switches and screw.

Note: Turn off the main power supply before inspection and put away the tools after inspection.

3.4.5 Cautions

For safety of operations, do not remove the safety door and limit switch as long as the safety door operates normally.

Fix the problem immediately when the safety door cannot be opened or closed.

In case any fault occurs in the process of operation press Emergency Stop button.

3.5 Mechanical safety device

3.5.1 Mechanical Clamping Safety Device

The location and structure of the mechanical safety device are as shown in Fig.3-3 and Fig.3-5A, 3-5B, 3-5C and 3-5D respectively. When the safety door is open, the safety block is in a free state, when the mold is closed, the safety block will prevent the safety lever from moving and thus prevent the moving platens from closing.

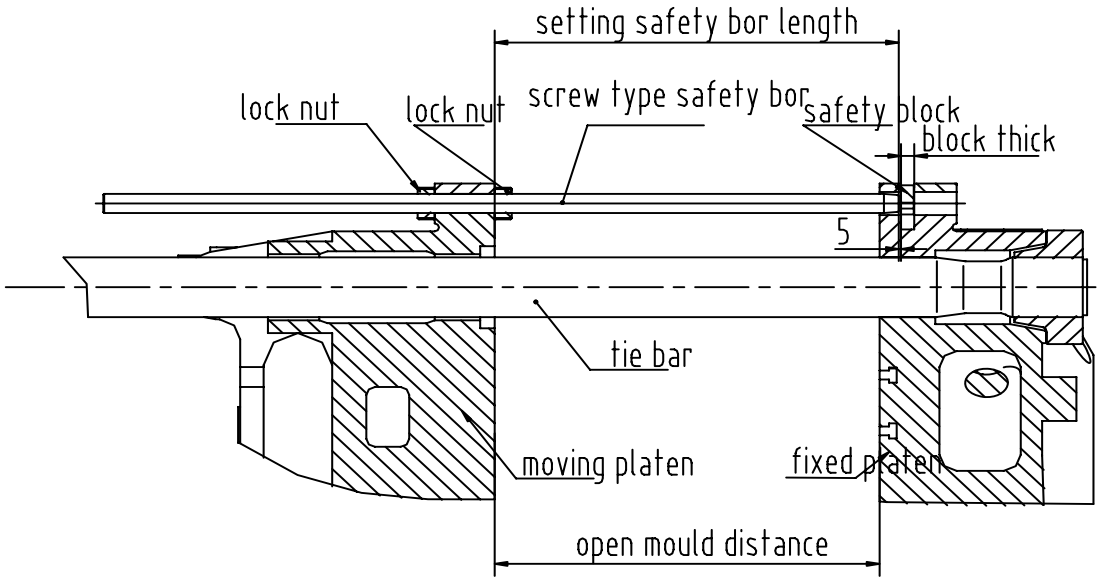


Fig.3-5A

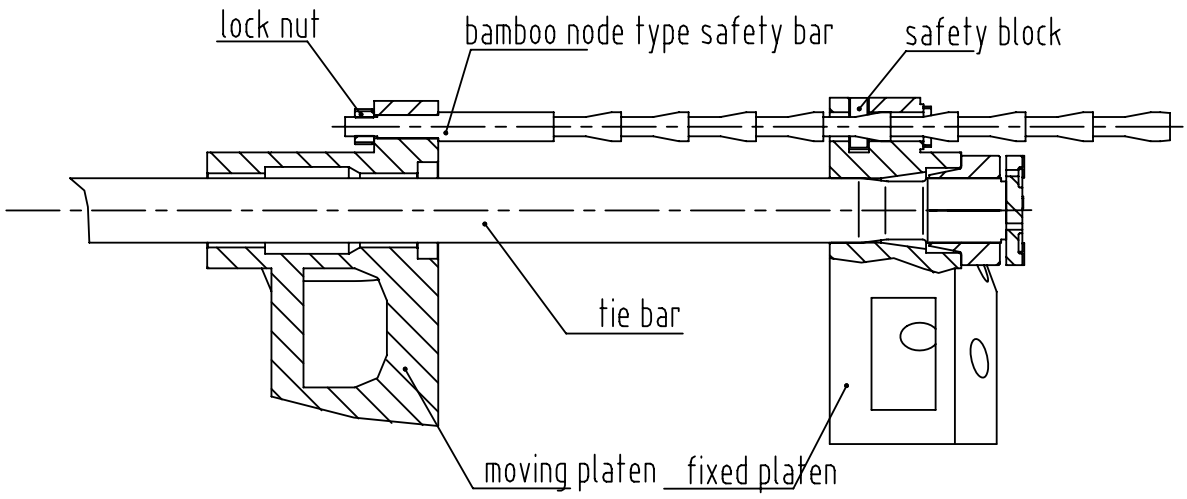


Fig.3-5B

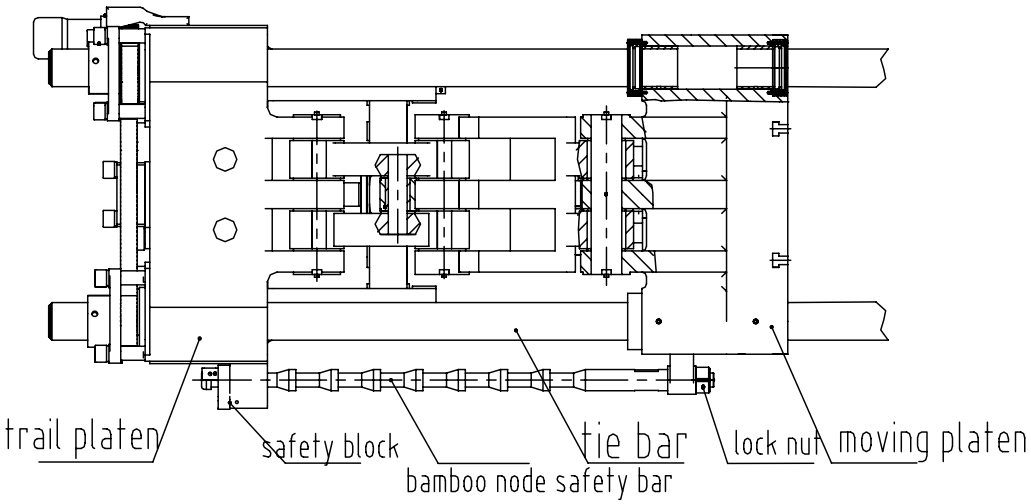


Fig.3-5C down putting machinery safety device

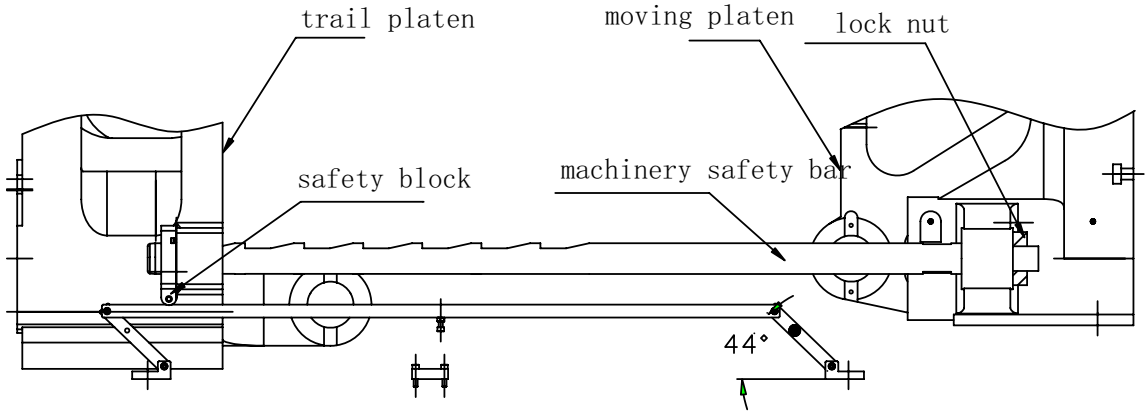


Fig.3-5D Saw tooth Type safety device

3.5.2 Inspection Steps for Test Run

1) Shut down the pump motor
2) Open the front safety door
3) Check whether the safety block drop freely, if yes, it is normal。
4) Turn around the safety block with your hand, if it moves smoothly, it is normal; otherwise you will have to adjust the safety device.

3.6 Hydraulic Safety Devices

The device is an optional feature and customer may order one if necessary.

The location of the hydraulic safety device is as shown in Fig.3-3. Under the front safety door locates a hydraulic safety valve. When the safety door is closed, the hydraulic valve is pressed and the oil hydraulic system of mold clamping is connected, or when the

moveable safety door is opened, the hydraulic valve springs and the oil circuit is cut off, thus the moving platen cannot be closed. There is only one hydraulic control valve under the front safety door.

Before running the machine, you must:

1) Check whether the press wheel on the hydraulic valve of hydraulic safety device is pressed down or not after the safety gate is opened/closed.
2) Check whether the mold is closed when the safety door is opened, closed and partly opened; do not operate until all these tests are passed.
3) Contact us for any problem do not restart the machine until problem solved, In addition, inspection shall also be conducted periodically.

3.7 Safety operation

Efficient, quality and safe operation is the goal of every manufacturer that includes us. For this reason, please pay attention to the following safety issues.

3.7.1 Mechanical operation

1) Beware of outside objects fall into the machine while operating
2) Do not climb onto the machine while it is running
3) Wear gloves and uses protective tools while working on the high temperature parts

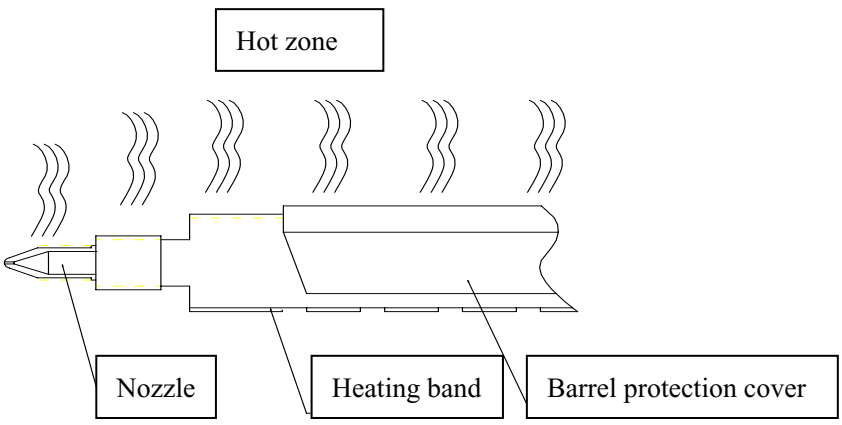


Fig. 3-6

4) Plastics such as Teflon, Polytoluence and PVC will decompose and release harmful gases after being heating and molten. In this case good ventilation system is needed. Detail see clause 3.8.
5) All the moveable safety doors have the function to stop the running machine when they are open, and all the fixed doors cannot do this and will not affect the operation of the machine when they are removed.
6) Do not feed the hopper make maintenance by standing on the injection unit.
7) Do not put foreign objects into hopper together with the raw material; otherwise the injection unit will be damaged.

8) Work idling is not allowed for hopper, in case of suspension of material feeding, the increasing heat may cause fire at the inlet.

9) While removing the nozzle, you should clean up the resins inside the hopper, move the screw backward and cool the hopper first.

☞ Note: Wear protective gloves and goggles while working.

10) While operating the mold, remember to:

◎ Open the safety door before putting your hand into the mold;

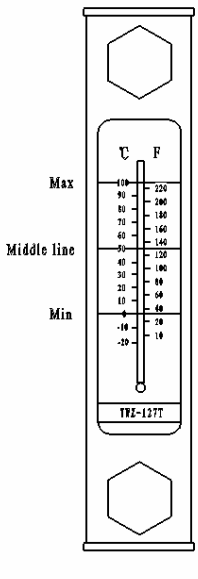
◎ Stop the motor and discharge the residual pressure in the oil circuit before moving your upper body into the mold;

◎ Make sure that the mechanical safety device works before entering the mold for operation, and at the same time turn off the main power switch and put on a "No-Power on" sign nearly.

11) Observe with caution on the devices during operation.

3.7.2 Hydraulic operation

1) Keep the oil pressure device away from fire.
2) The oil pressure of the old pressure device cannot exceed the preset value as higher pressure may result in fault of oil pressure device and crack or leakage of the high-pressure oil tube.
3) Check oil level of the tank before switching on the device, and the oil shall be leveled above the centerline of the oil level gauge.
4) Do not operate the device when the oil temperature is below 15℃ or above 60℃. Do not start up the hydraulic pump if the oil temperature is below 0℃. In general, the working temperature of the hydraulic oil is between 40 degree to 50℃.



Oil level

5) Do not press any leakage point of oil tube and flange that it is connected between oil tube and valve with hand, as the high-pressure oil is very dangerous. In case of any leakage, shut down the pump motor and repair the leaking part immediately.

3.7.3 Electric operation

1) Keep in mind to shut off the main power switch in case of any emergency.
2) Always keep the electricity cabinet door closed. When it is to be opened, cut off the main power supply first.
3) In case of electric fault such as blown fuse or switch trips, should be repaired by professional maintenance personal.
4) Upon completion of wok or sudden power interrupting, cut off he power supply for the sake of safety and protection the electric devices.
5) Non-professionals are not permitted to touch any electric parts (electric cabinet, motor and electric heater coil) to avoid any high voltage shock.

3.7.4 Maintenance

First cut off the main power supply before maintenance and put on a sign of "No Power on" at an eye-catching position nearly.

Inspection the safety devices periodically, if find any fault you should rectify in time.

No tools leaved on the machine.

3.8 Poisonous gas，fog and powder

The poisonous gas，fog and powder can be expelled from some resin when Heated excessively, such as PTFE, PVC. If the poisonous gas fog and powder can't be eliminated by adjusting the machines' parameter, it's necessary to install a ventilating fan running together with the machine.

Following as Fig 3-8 of ventilating fan's installation:

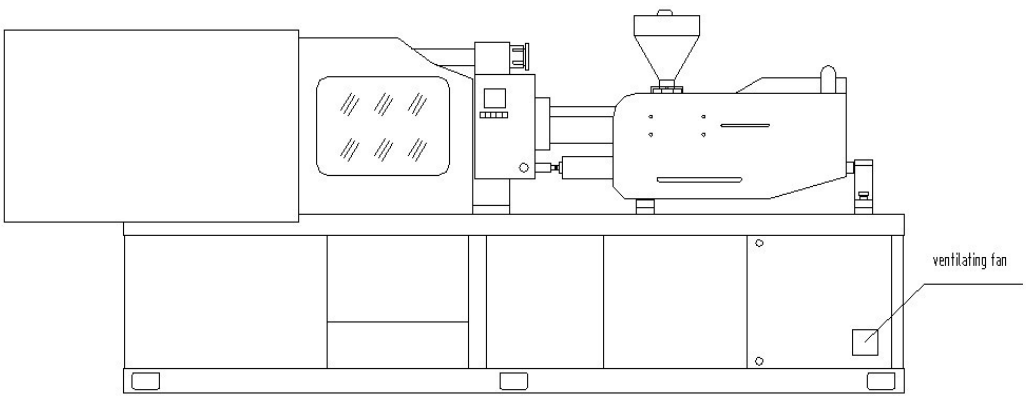


Fig. 3-8

3.9 Quickly decomposed plastic

Some kinds of plastic, such as poly-toluene, PVC, can be caused to decompose and explode after being heated long time.

Rules of keeping accident away:

Process various plastic strictly according to their characteristic and processing requirement, especially, the processing temperature of barrel and stay time in the barrel.

Shorten the material's stay time in the barrel if the material is sensitive to heat. In case of intermit of injection operation or change processing material, clean the barrel with polyethylene (PP) or PE etc, and then stop heating.

3.10 Machine's noise grade

The measurement of noise grade is according to the standard of EN 2011997 ANNEXD. The noisy grade is the same with the various driving devices and is measured at the workshop of the manufacturer when shut off the other entire noise source.

3.11 Cautions

Before operating the injection-molding machine, fill the hydraulic oil and lubrication oil to the level above the specified scale see Fig.3-7.

The viscosity of the lubricating oil used cannot be too high or too low.

The over high viscosity will result in:

-Increased internal friction

-Soaring oil temperature

-Unsteady movement of moving parts

-Pressure loss

-Over-consumed power

The over low viscosity will result in:

-Increased oil leakage at the oil seal

-Decreased operation precision

-Decreased pressure efficiency

-Decreased pump efficiency

- ◎ Don't ascend the machine during machine is running,
- ◎ For protection barrel, don't put metal material with plastic material together to hopper,
- ◎ The screw is not been revolved for long time without plastic material,
- ◎ Don't stand on injection unit to filling or repair machine,

◎ Don’t remove the fixed gate during operation machine,

◎ When removing nozzle, first clearing plastic material into barrel and making screw back, then cooling barrel to 100℃ degree, finally, loosing nozzle. Note: during removing nozzle, must wear glove and eyeglass,

◎ To pay attention to the warning brand during operation machine, the most dangerous area of injection molding machine is follow as diagram fig.3-9.

Including:

Damager A—the area is clamp unit between fixed platen and moving platen. Because the machine can bring the largest clamp force, and make person extrusion if you put your hand or body into there.

Damager B—nozzle unit. During the machine working, the nozzle has brought about hotter temperature and spray hotter plastic material melted to make scald.

Damager C—injection barrel unit. The barrel surface is very hotter and the heating band terminal is living electricity during the machine running, so it makes scald and get an electric shock.

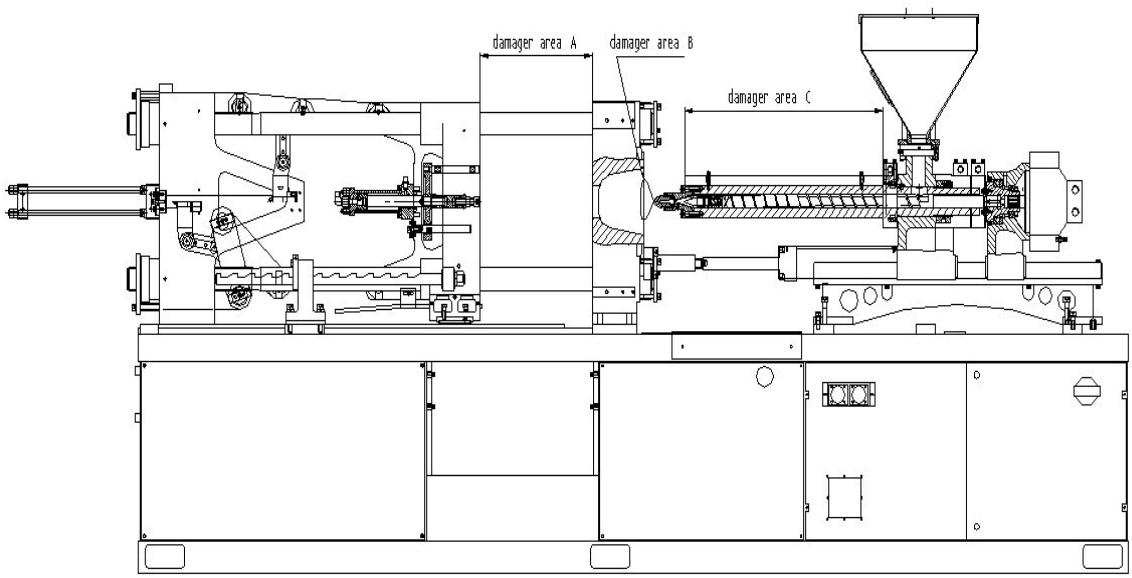


Fig 3-9 show danager area

If you enter the damager area, must do it as follow:

※ Enter damager A area:

If you want your hand reach in this area, must open the safety gate first,

When you want your body enter in the area, first must stop motor, clear out pressure in the oil circuit, then shut off power resource and put “no electric voltage ” brand near the circuit breaker.

※ Enter damager B area:

Should wear glove and eyeglass, person’s face do not close the nozzle.

※ Enter damager C area:

First prevent from hot temperature and wear glove, second shut off heating power recourse on the menu.

The hydraulic oil within the 32-68CST/40℃ viscosity class is required, and the 46SCT/40 ℃ viscous hydraulic oil is recommended.

The machine is equipped with centralized lubricating system. See Fig3-10. Add lubricating oil to the specified level and make daily inspection before operation. Lubricating grease such as 0#, 1# lithium base grease and molybdenum dissulphur grease is needed for certain parts.

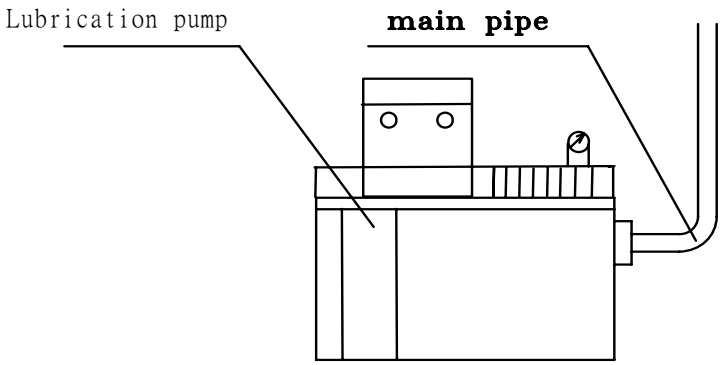


Fig.3-10

The parts and spare parts specially designed and manufactured for the injection-molding machine cannot be used for any other purpose absolutely. And they shall be preserved properly to avoid rust, scratches and aging.

Chapter 4 operation

In addition to the daily operation of the machine, this section introduces some other works (such as changing and removing mold, replacing screw, etc), notes and caution for operation. Safety always is the top concerning in operation.

If any design or manufacturing defect found in operation that affects operation or shows insufficient safety protection and needs improvement (including mechanical structure, parts, circuit system, hydraulic system etc.), please feel free to contact us or our office or agency nearby. We will take necessary action immediately.

☞ **We are not liable for failure and damage arising from unauthorized modifications, especially for the parts and loops relates to the safety circuits and the hydraulic circuits.**

Please be remained that the pump motor and the main power supply must be turned off before ant auxiliary work is started.

4.1 check

Be sure all thing of machine is ready. The machine shall be in good condition in all aspects, especially the safety unit. The oil level in the tank and the lube pump shall be above the midline. The cooling water and the power supply shall be ready. Only after all the above have been confirmed can the operation.

4.2 electricity voltage

First, Inspection the voltage and frequency fit the machine specified. Then switch on main switch QS and air circuit breaker. It appears words and figure on the menu of computer.

4.3 Hydraulic oil pre-heating

Start Hydraulic oil pump motor. The pump provides pressures 60bar to hydraulic system during hydraulic oil pre-heating. Hydraulic oil temperature receive 45℃ operation temperature quickly.

CAUTION:

In oil pre-heating process, all other machine operation is prohibited.

When oil temperature is low, oil viscosity is too high and makes oil filter blocked, system will give alarm.

When oil temperature is over 60℃, the running of machine will stop and give alarm on display.

When oil temperature is over 63℃, pump will stop and give alarm on display.

4.4 Hydraulic system oil monitoring:

Oil temperature:

Machine control system automatic controls oil temperature; machine will stop in case of oil temperature too high.

The oil level in the tank and the lube pump shall be above the midline.

Only after all the above have been confirmed the operation and mounting of mold of mold be started.

4.5 electric –thermal starting

The barrel begins to be heated by "electric-thermal" button. In general, it takes about 30minut to the heating temperature setting.

☞ **Special attention to: prohibit starting action of "plasticising" and "injection" strictly.**

4.6 manual operations

Starting machine first should be set lower pressure and speed in the action data page. You can press each key to observe machine action correctness.

4.7 semi-automatic operations

Close safety door and then press semi auto button to start semi auto operating cycle. There is no any trouble after one cycle finished, while open -close safety door again the machine enters second semi-auto working cycle. In general you can ensure the semi auto operation is normal after 3-5cycle of normal processing.

4.8 automatic operations

Close safety door and then press automatic button to start automatic operating cycle. It makes sure the function of automatic operation normally after 3-5cycle of normal processing.

4.9 descriptions some machine activation as follows:

a. During clamping, the speed and pressure value that you have already set on the menu would change slightly. When moving platen of machine move close fixed platen, the pressure and speed of clamp system will go to low pressure, low speed. After check nothing in the moulds, the clamp system will lock the mold at high pressure. The limit switch S4 will be depressed Completely, the clamping activation stops.

b. During opening mould, it is requirement that the opening speed is controlled at low- fast-low –stop. When opening mould start, the hydraulic system will be at slowly speed & high pressure for insure enough open mold force. After mould platen moved away a little,

the hydraulic system can automatically perform at low speed & low pressure. When the product is divorced from mold, the hydraulic system will carry automaticlly out at fast speed again, the mould platen open at fast speed, then the hydraulic system will discharge so that the moving platen movement can gradually reduce speed until the direction valve close and moving platen movement stop.

c. When operation process, the carriage movement will retract without limit switch controlled. During semi-automatic and fully automatic of operation, the limit switch S5 is only as exchange switch between carriage forward end & injection starting.

d. During Injection process the machine can work to inject at heating of multi-steps, then the machine will be holding pressure.

The computer program according to transducer position controls automatically above all activations.

4.10 mounting and dismounting of mold

4.10.1 mounting of mold

Make sure that the mold matches with the machine specification shown in the platen diagram. Be aware of the dimension of S1, S2, H1, and H2. The mold can be mounted unless the outline dimension of the mold is not larger than space between tie bars S1, S2. Be aware of the dimension of fixed screw hole in the platen MM and the distance of screw holes. The shape of the platen is as Fig. 4-1(the detail see appendix 2). Refer to the annexed drawing for the specific dimensions.

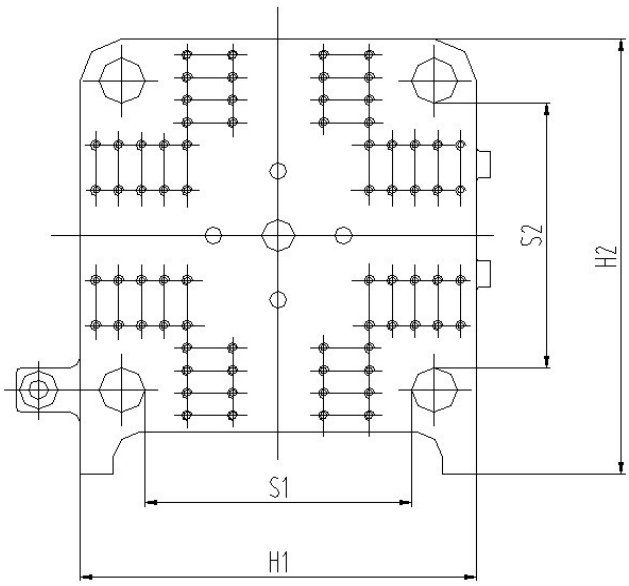


Fig.4-1

Please pay attention to: if a mold device connection area is less than 40% of S1xS2 area, should put a block plate under mold

Steps of mounting:

1) Join two halves of the mold together;
2) Clean the mold platen with anti-rust agent;
3) Press “MOLD THICK” to moving the moving platen to end position;
4) Press “NOZZL RET.” To backward the carriage;

Note: above operation should be under “manual” mode.

5) Press “OPEN” to move the moving platen to maximum position;
6) Put the mold into central hole of the fixed platen and fix it to the fixed platen with mold clamps;

☞ Note: the ratio of length (H) and the diameter (D) of the fastening bolt ranges 1.5-1.8.

7) Press “MOLD THIN” to set the mold thickness;
8) Set the mold clamping parameter to the low level;
9) Clamp carefully under “manual” mode;
10) Alternately press “CLOSE” or “MOLD THIN” until the moving platen touch the mold;
11) Fix the moving part of the mold in the moving platen;
12) Remove the mold hanger;
13) Press “OPEN” and “CLOSE ” carefully to try the open and close operation.

⚠ **Note: the above steps must be operated carefully *under the* “manual” mode and low pressure.**

Pay attention to the ejector length during mounting.

4.10.2 dismounting

The dismounting of mold generally reverses the steps of its mounting.

Main steps:

1) Join the two halves of mold together;
2) Mount the hanger;
3) Press “OPEN” to move moving platen backward to its end position and make sure that the elector is at the last position;
4) Press “NOZZLE RET” to move the nozzle backward to end;
5) Lift the mold.

☞ Note: the oil pump motor and the power supply must be turned off before lifting.

4.10.3 Adjustment of Clamping Force

The clamping force may be adjusted manually or automatically.

Steps for manual adjustment:

※ Start the oil pump motor;

※ Press “MOLD THICK” or “MOLD THIN” to start adjustment;

※ Set the opening/closing pressure while adjusting oil flow quantity slowly.

☞ Note: Set the pressure and flow lower at beginning and then increase them slowly after the appropriate adjustment.

※ Repeat opening, adjusting and closing to make sure that the toggle can stretch straight at the closure of the mold;

※ Observe the reading on the pressure gauge to make appropriate adjustment of the clamping force;

※ It’s ok until the clamping force is satisfactory;

※ Feed for trial production and readjust the clamping force, if necessary.

☞ Note: The clamping force is proved acceptable if the finished products do not have burrs. Over clamping force may shorten the service life of the machine.

Steps for automatic adjustment

◎ Start the pump motor;

◎ Open the platen to its largest position;

◎ Set the opening, closing and adjusting parameters;

◎ Close the safety door and press “AUTO MOULD” button; until you feel satisfied.

Finally, repeat mold closing and opening, and injection carriage forward and backward under manual control, make overall check for correct data input. Make trail production until the product meets with the quality standards.

☞ Note: the above adjustment shall be slowly in the manual mode except for the automatic adjustment.

When loading and removing the mould, no magnetic force shall be used to lift the same for this equipment series.

4.10.4 Adjustment safety device

If the safety device is nodosity type and sawtooth type (as Fig.4-3.1 and Fig.4-3.3), it does not adjust. If the safety device is screw type (as Fig.4-2) it needs to adjust after setting open mold stroke at open mold to end.

Step as below:

1) Shorten safety bar: first turn right locating nut by anticlockwise until a collision head of safety bar is close safety block (near 5mm), then turn the left locating nut by

clockwise to fasten safety bar.

2) Protraction safety bar: first turn left locating nut in by anticlockwise to need length, then turn right nut by clockwise to make safety bar protraction until a collision head close the safety block (about 5mm), finally tighten safety bar.

Note: after setting safety bar, must tighten right & left nut.

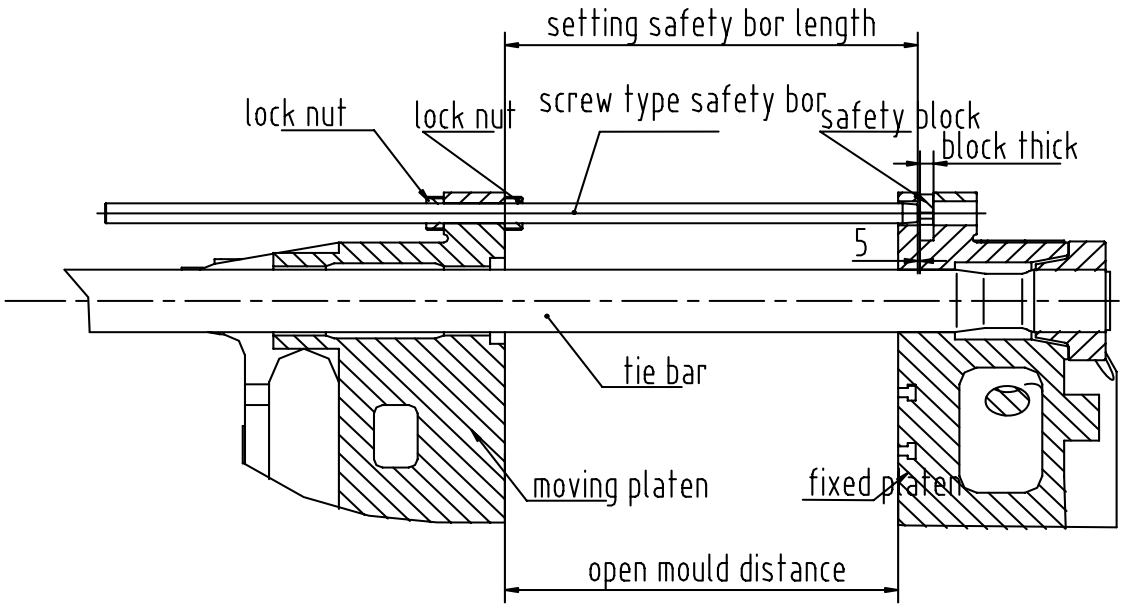


Fig. 4-2 screw type safety device

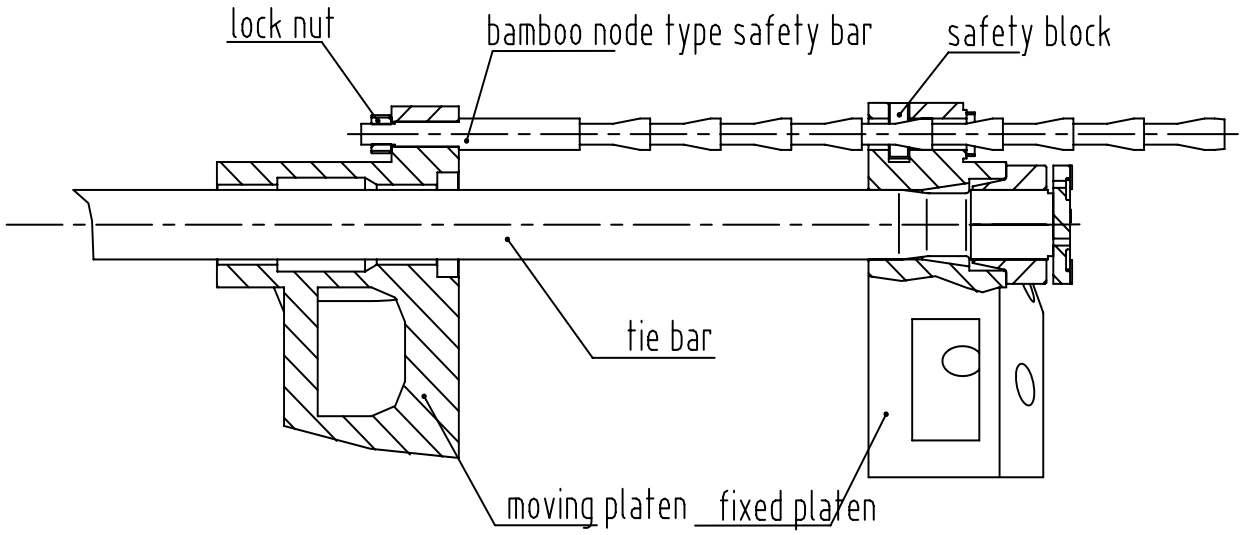


Fig. 4-3.1 nodosity type safety device

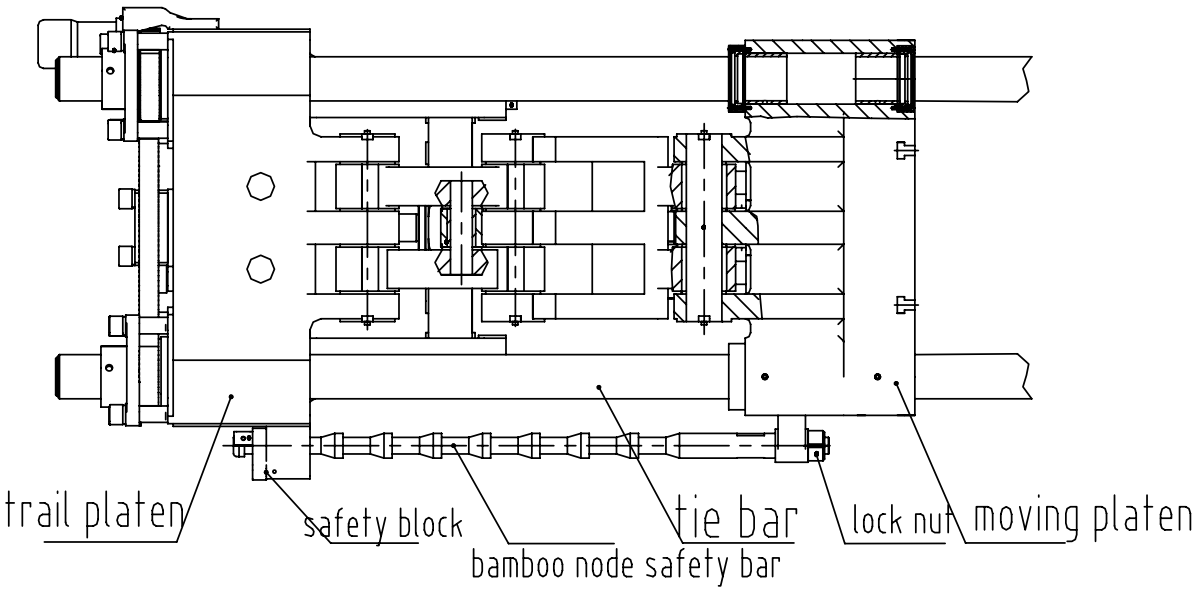


Fig.4-3.2 down putting machinery safety device

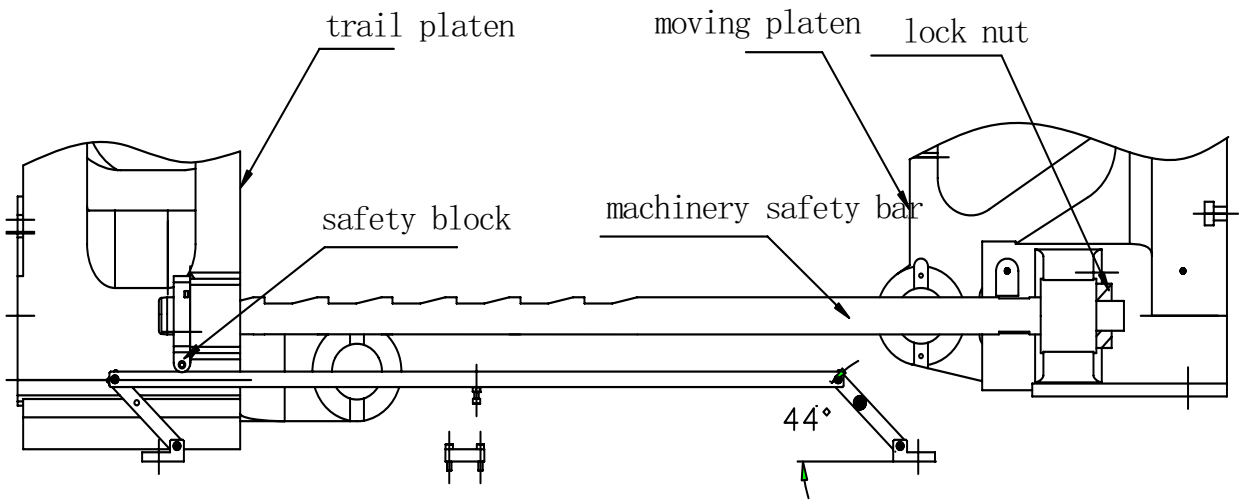


Fig.4-3.3 Sawtooth Type safety device

4.11 Adjustment of slide plate

4.11.1 adjustment of slide plate

The machine is equipped with the moving platen holding device to avoid the tie bars deformation due to the mold bearing and the heavy weight of the moving mold. The structure of moving platen runner is shown as Fig. 4-4 and Fig.4-5.

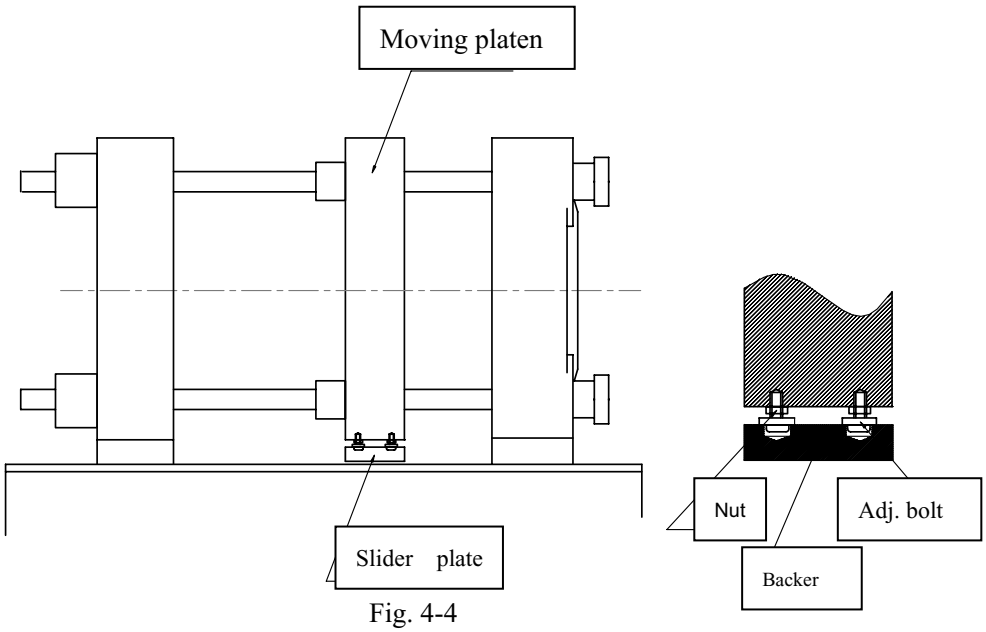


Fig. 4-4

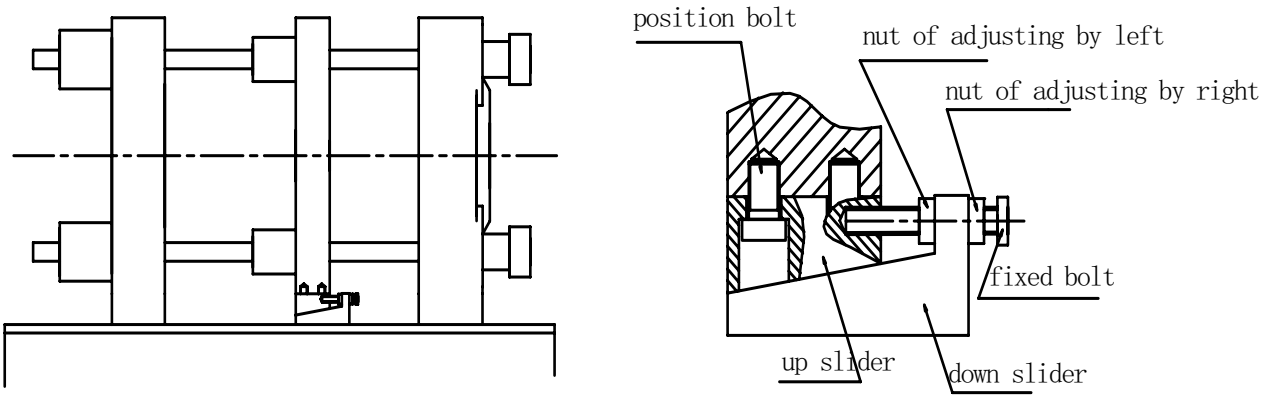


Fig. 4-5

It has two functions:

◎ Protect the tie bar from deformation under the weight of moving platen and mold;

◎ Make slight adjustment for precise central alignment of tie bar.

This device has been adjusted in factory before delivery.

Note: in case of incorrect installation and serious wear out of device, can be result the support forced of moving platen in more serious wear out.

4.11.2 Adjustment of slide plate:

1) When adjustment slides plate, first adjust iron block under machine body, and check to level whole machine, then remove the mold on the moving platen,

beginning adjustment the slide plate.

2) Screw or unscrew axial adjustment screw to make the runners come closely to the slide way;

3) Open and close the mold in the state of no feed and then adjust axial adjustment screw;

4) Try again after feeding to see whether finished product has flash or not, if any, readjust axial adjustment screw.

☞ Note: the supports must be always adjusted at the same time.

4.12 injection working step

1) First setting the barrel temperature to suitable plastic temperature, then wait 15 minutes and start next step after receiving setting data.

2) Feeding material into hopper according to feeder requirement.

3) Setting end position and backpressure of plasticizing and screw rotate speed according to weight of product and raw martial ratio. Then setting each injection section and time or pressure of holding pressure according to molding requirement.

4) Start oil pump motor, press close mold button until close end mold.

5) The carriage moves forward by pressing “carriage adv”.

⚠ **Pay attention to nozzle must keep close to sprue of mold.**

6) Stopping charging automatically after the screw turn to setting position by “plasticising” key.

7) First inject and then stands holding pressure state by “injection” key, finally injection finished.

8) Begin charging material of next mold by “plasticizing” key.

9) Before pressing “open mold” key, should have cooling time energy, then press “eject” key, finally open safety door and take the product.

10) Observe molding product quality, and do step3) to step9) again until the product is good.

11) Test the product and start semi auto operation or automatic operation.

4.13 Treating after finishing the injection

a) Finish working

First shut hopper by baffle and turn off electricity of barrel, then clamping at low pressure by manual, the carriage and screw retract to end position, finally and switch off oil pump motor and turn off all electricity power.

b) Change material and change mold

First shut hopper by baffles and turn off electricity of barrel, and then clean remained melts material in the barrel several times.

4.14 Replacement of Barrel and Screw

4.14.1 Mechanical structure of Injection Unit

The mechanical structure of the injection unit is as Fig.4-6.

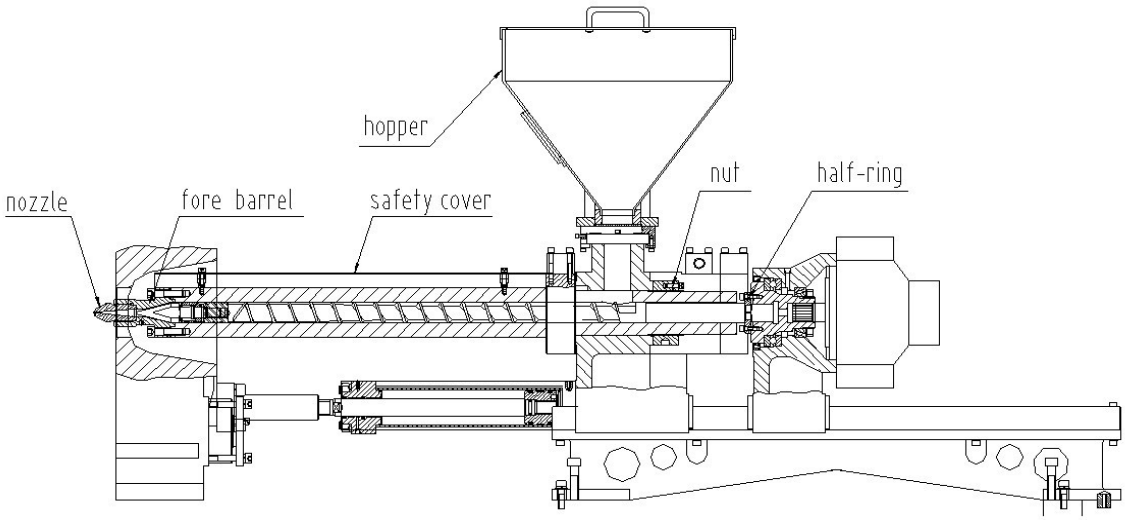


Fig 4-6

4.14.2 Replacement of screw

☞ Note: If the barrel is not cooled down, it may cause fire. Do wear your protective gloves and goggles. Be careful against burn while cleaning the residue.

Pay attention to you safety!

Some resins with high viscosity often stick to the screw and barrel when cooled down; it may damage the metal surface. If the screw is replaced to process this kind of resins, clean it with cleaning agents (PE, PS, and PP) to simplify the cleaning and removing procedures.

☞ Note: some necessary tools such as wooden rod, steel rods clamp should be ready before removing.

Before dismounting screw and barrel be careful following:

1) Clean remains melt material several times.

2) Move injection unit backward end position in the manual mode

3) Remove Hooper

4) Remove cover of barrel

5) Turn off heating and cooling of barrel and screw. Remove contact of heating ring and thermocouple, and pipe joint of cooling water.

6) Do not over stretch the wires and hoses when moving the injection carriage at the non-operation side.

☛ Note: Any plastic material left, should be burned away. We suggest to burn this plastic with propane gas. Do not anneal screw while burning plastic.

Step for dismounting:

1) Remove the fastening and adjustment screws from the carriage. Take the positioning pin of the injection carriage; push the injection carriage towards the operation side.
2) Lower the injection speeds and pressure and set the speed and pressure around 30%,
3) Move the carriage to the end position by pressing NOZZEL RET button,
4) Remove the carriage the nuts and bolts, exothermic ring and nozzle flange in sequence.

☛ Note: be sure to wear gloves and goggles, as the temperature of barrel is now very high.
No physical contact. The oil pump motor must be turned off before removing.

5) Start the oil pump motor and adjust injection pressure and speed to be 20-30%,
6) Press NOZZLE ADV to get to the proper position,
7) According to Fig.4-7, remove the bolts and semi-ring in succession, press NOZZ ADV and remove the screw and the flat key,

Beware of high temperature

8) Move the carriage to the end position by press NOZZ RET button,
9) Put a wood log between the screw and the moving platen, take the wood with a clamp rather than hand,

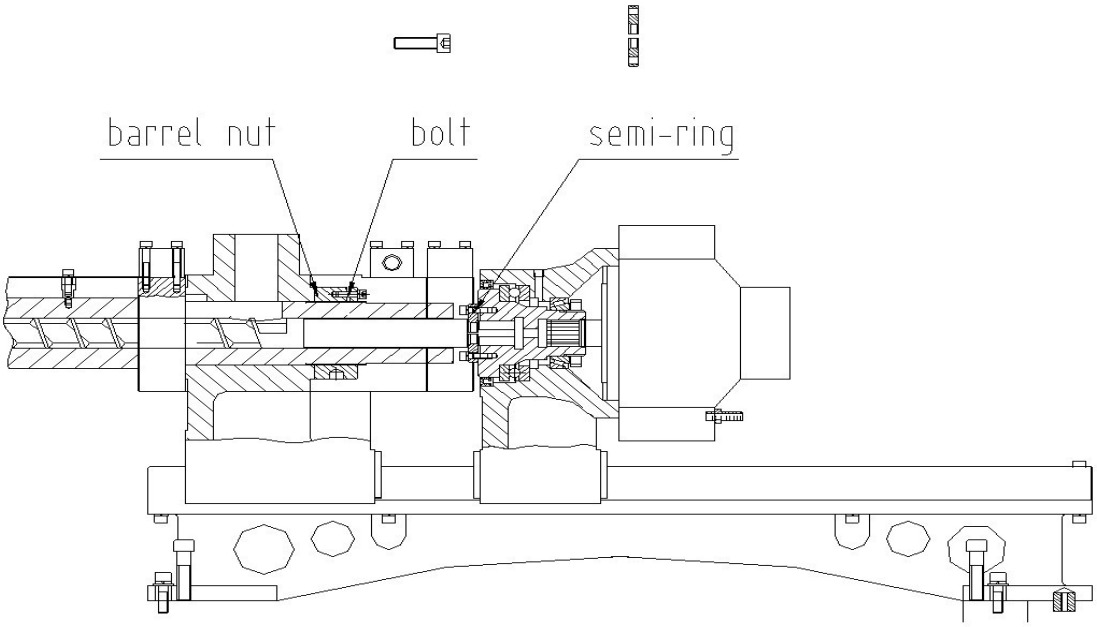


Fig.4-7

10) Press NOZZ ADV to eject to screw,

Be careful of the high temperature and never grad the screw with your hand.

11) Add more wood log until the screw comes out;

12) After it is removed, hold the screw with clamp and put it on the wood to prevent damage.

13) Please note that the screw head has the left-hand thread.

Do not touch the screw since it may be hot.

For installation, reverse the above steps. Please note that when installing the nozzle flanges, if the bolts are over fastened, the screw may be damaged, if the bolts are loose, leakage may occur.

☞ **Special attention: in assemble, only high yield bolts, nozzle, plasticising and injection cylinder provided by DAKUMAR company are sued and no other type product is permitted!**

4.14.3 Dismounting of barrel

The screw shall be removed first before dismounting the barrel. Even if you do not want to remove the whole heater screw, you still have to push it forward to a proper position for the purpose removing the nuts off the barrel.

Steps of removing:

1) Rewove all the heater bands on the barrel see Fig.4-6;

Take care the temperature is high! Turn off the oil pump motor before the working.

2) Lift the barrel; just hold the barrel with the lifting rope rather than lifting it up too mach power.
3) Remove the nuts and screw from the barrel;
4) Insert a wood log between the carriage and back plate of carriage; take the wood log with clamp rather than hand, see Fig.4-8
5) Move carriage forward at lower by manual, and to bring out the barrel. Please keep the barrel at level during the process.
6) Handle the dismounted charging barrel with care.

The procedure of mounting screw is just reverse of that of dismounting.

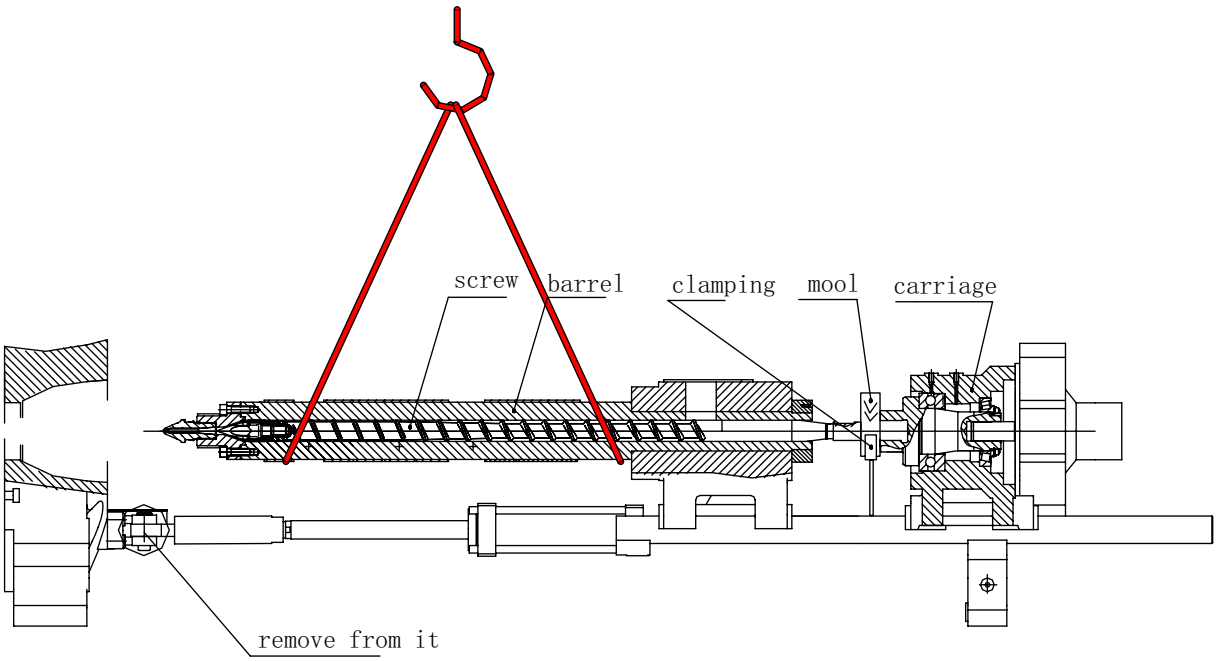


Fig.4-8

4.15 Replacement of plastic material

1) Clean up the resins in hopper;
2) Shot the residues several times at the clean-up position in the manual mode no resin comes out;
3) Clean up the barrel;
4) Add the new material into the hopper;
5) Operate the equipment till the new material come out, then put it into use.

It shall be noted that, when feeding material or maintenance, a feeding ladder shall be provided to facilitate the worker feeding the material or maintenance and avoiding his falling off.

4.16 selection and replacement of injection nozzle

4.16.1 selection of the injection nozzle

As the most important part of the plastic injection system, while the nozzle is working, melted plastic material driven by the screw is injected to the mould through the nozzle. During the working process, the melted plastic material is sheared in the nozzle thus producing high heat rendering the nozzle bearing the pressure from both the plastic injection system and the plastic material in the moulds.

The struc

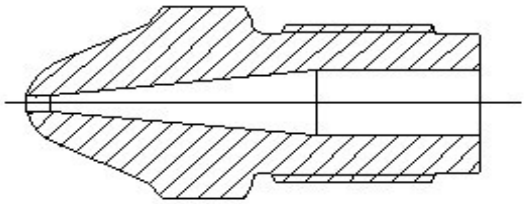


Fig.4-9

The head of the nozzle is sphere in the size to suit the concave surface of the mould. In general, the sphere radius of the nozzle shall be 0.5-1mm smaller than that of the mould, or both have the same normal size while keeping the tolerance of the nozzle in minus value.

The size of the aperture of nozzle is dependent on the injection pressure and shearing heat of material.

All injection machines produced by our company are equipped with standard injection nozzles, and for each model, the nozzles of same structure but different sizes are also available. For detailed size, please refer to the chapter 1 in the operation manual.

In case you require nozzle with special requirement, please contact us and we shall endeavor to solve your problem.

4.16.2 Install and remove the nozzle

Before installation or removal of the nozzle, pay attention to temperature of the material pipe unit the nozzle, which may be very high. Besides, the pressure also inject in the injection system therefore protection suit is also required along with goggle and gloves in operation. See Fig.4-10 he installation and removal operation without protective suit is forbidden.

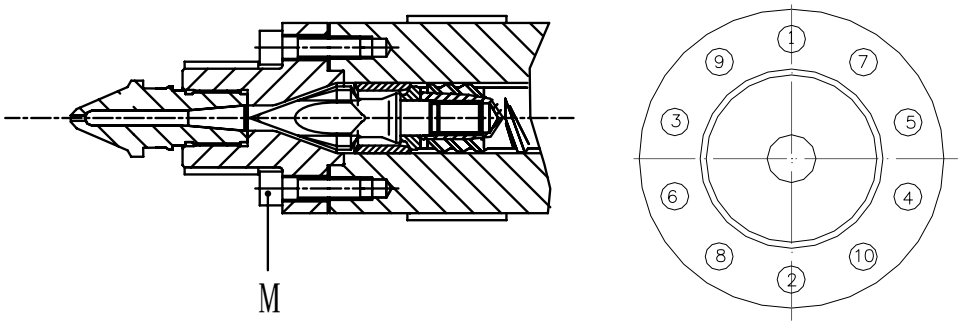


Fig4-10

4.17 Selection of screw and barrel

4.17.1 How select screw diameter

Injection pressure depends on screw diameter. The injection pressure high should select small screw diameter. Selection screw is dependence on following factor:

◎ Plastic material and product's volume;

◎ Molten and flow property of plastic. Usually high viscosity plastic material asking for high injection pressure to get thin wall thickness of product

◎ Thought of length of passage distance in the mold or thin wall of product.

◎ Kind of Injection sprue gate.

4.17.2 Suggestion screw selection

Screw A

Screw A used for product with thin wall. It is used for plastic material with high viscosity and non-standard pouring hole.

Screw B

It is used for most popular plastic material (such as PP PE ABS etc) and standard plastic product.

Screw C

It is used for thermoplastic with low viscosity and short runner mold. It is also can be used on thick PVC product.

4.18 Adjustment of backpressure

The backpressure may increase melts effect and correcting injection measure. So you can adjust backpressure of proportion valve to achieve some backpressure on the retraction of injection oil cylinder.

In general the backpressure is about 0.5-2.0Mpa. It depends on product quality. The backpressure is too high will cause to fall feeding power and also cause temperature too high due to friction and cutting plastic material.

Backpressure adjustment has tow mode: one is by manual and other by computer setting.

This machine's backpressure adjustment is YV11. Turn YV11 clockwise to increase backpressure, contrariwise decrease backpressure.

4.19 Maximum allowable temperature of the plastic injection unit

While working, the material feeder unit is in high temperature and high pressure status, the maximum operating temperature of the plastic injection unit of the machine is 400℃.

Chapter 5 Machine maintenance

Please service the machine periodically to keep in good performance and conditions, avoid and reduce failure of sophisticated mechanical and hydraulic parts, improve product quality, reduce wear and lengthen service life.

5.1 Lubrication

Proper lubrication will lengthen the service life; on the contrary, poor lubrication will result in the wear and heat of parts. The clamping unit of the machine employs auto central lubricating device, and the other necessary moving parts have grease nipples for lubrication. See table 1.

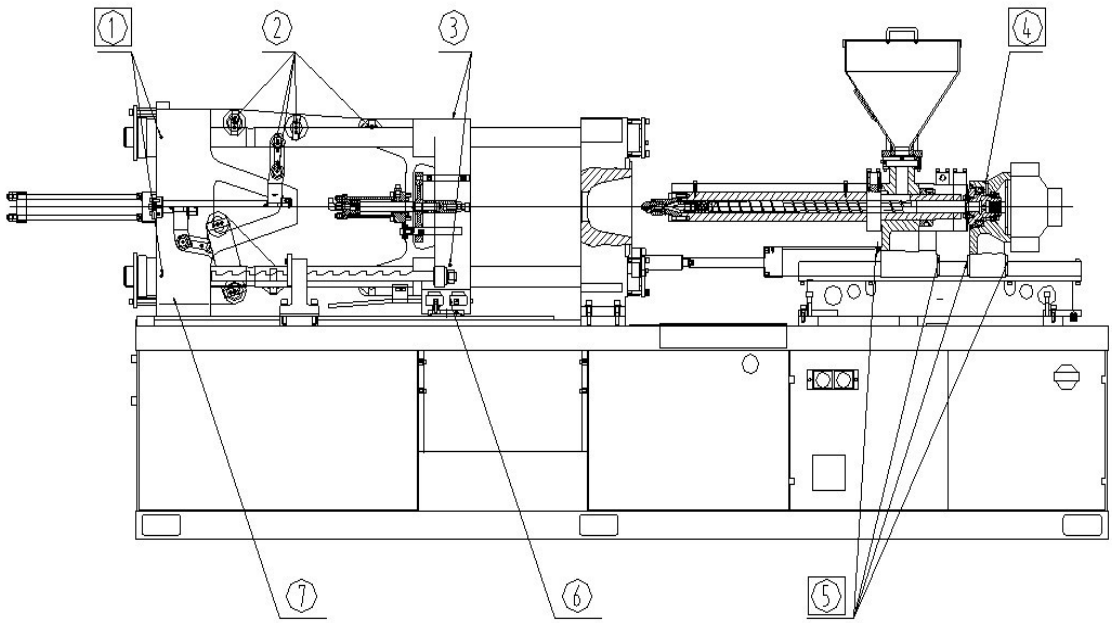


Fig 5-1

◇ MOS_2 grease

○ #220 lubricate (small machine)
#00 lithium grease (large machine)

Lubrication oil is an important factor of the machine. No operation without lubricating, otherwise the equipment will be seriously damaged.

The following should be focused on when using the lubricating oil:

1) For the selection of the lube oil and grease, please refer to the recommendation in the above chapter;

2) Store some lube oil for maintenance need, take care of storage:

※ The oil barrel oil should be properly sealed; Keep away from water;

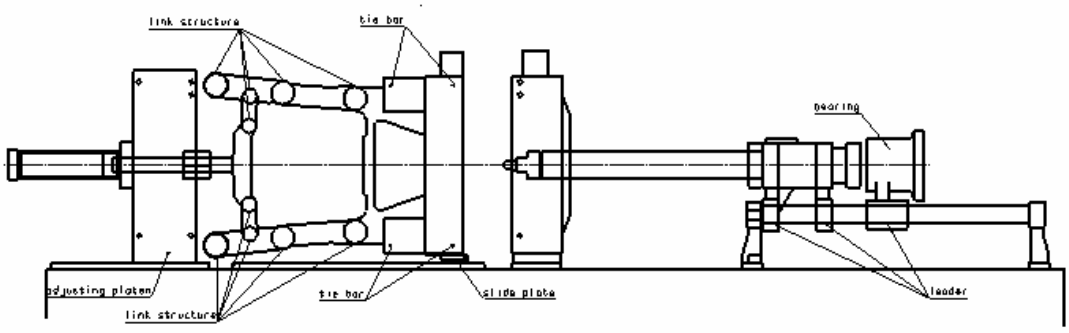
※ Protect the oil containers from exposure to sunshine;

※ The storage temperature for the oil should not exceed 40℃.

2) Always keep the oil tanks with enough oil, and add grease once every 3,000-4,000 working hours.

Table 5-1 of Lubrication list

Sign	Lubrication place	Times	Lubrication	Frequency
⬡	Rear platen area	2	Oil	Automatic
	Hinged axles	22	Oil	
	Moving platen runners	4	Oil	
	Holes of the tie bar on the moving platen	4	Oil	
⬡	Bolts of the tie bar on the moving platen	4	Grease	3000-4000hB
	Holes of the tie bar on the rear platen	4	Grease	
	Injection bearing	1	Grease	
	Holes on the barrel platen and the motor platen	4	Grease	



distributing of lubrication point

5.2 Maintenance of hydraulic unit

5.2.1 Hydraulic oil

5.2.1.1 Selection of hydraulic oil

As the medium for power transmission, the hydraulic oil is used for lubricating the surfaces of metals. Since the variety and higher performance of the hydraulic equipment, the requirement for hydraulic oil is more and more strict.

In general, hydraulic oil should:

※ Flow freely under the working conditions;

※ Form appropriate seal in the moving accessories;

※ Have no physical or chemical changes while working;

※ Anti-rust and anti-corrosion;

※ Resist certain load and reduce the wear of moving components;

※ Separate moisture, dirt and other foreign substances quickly while static;

※ Suitable for sealing, etc. during working;

※ Fine resistance;

※ Bubbles resistance.

Hydraulic oils can be classified into the following categories:

<table>
<tr><td rowspan="6">Hydraulic oil</td><td rowspan="2">Mineral oil</td><td>Common types (turbo R&O) wear-resisting hydraulic oil</td><td rowspan="2">Low temperature oil wide temperature hydraulic oil</td></tr>
<tr><td>Energy saving hydraulic oil with high viscosity</td></tr>
<tr><td rowspan="3">Moisture hydraulic oil</td><td rowspan="2">Emulsion</td><td>Oil-in-water emulsion</td></tr>
<tr><td>Water-in-oil emulsion</td></tr>
<tr><td colspan="2">Water ethanol type high moisture fluid</td></tr>
<tr><td rowspan="2">Synthetic fluid</td><td colspan="2">Nitrate ester (flame resisting hydraulic fluid)</td></tr>
<tr><td colspan="2">Fatty acid hydraulic fluid (water proof)</td></tr>
</table>

The mineral hydraulic oil is the most one at present. According to different boiling points, the crude oil with different viscosity can be produced. Therefore, this category is widely used. The crude oil will have a variety of applications upon adding suitable additives, such as common hydraulic; wear resisting hydraulic oil, wide temperature hydraulic oil, energy saving hydraulic oil etc.

The flame resisting hydraulic oil can be classified into two types roughly, one is with moisture and other is synthetic oil. Moisture flame resisting hydraulic oil includes oil in water and water in oil emulsions, water ethanol and high moisture hydraulic fluid.

The synthetic oil includes mono phosphate ester, fatty acid, etc, which are used under circumstances where exists combustion hazard.

Generally speaking, in terms of the lubricating quality, stability and sealing features, the flame resisting hydraulic oil and the synthetic oil are not as good as mineral oils. Please consult the supplier concerning these two categories.

In the past, the mineral hydraulic oil was used fro lubricating injection-molding machines. Due to the moisture and explosion risks, the flame resisting hydraulic oil has replaced it in the recent years. Among types of the flame resisting hydraulic oil, water ethanol hydraulic oil is highly recommended by the fire deportment. In addition, this type of hydraulic oil becomes more popular for its convenient application and disposal.

The selection of hydraulic oil is mainly based on the viscosity, lubricating performance, the oxidation stability; shear stability, flame resistance and its effect on the sealing material.

5.2.1.2 quality control on hydraulic oil

The items measuring the quality of hydraulic oil include: viscosity, lubricating performance, oxidation stability, shear stability, flame resistance and its effect on the sealing material.

General samples for control reference regarding the hydraulic oil applied on industrial machines.

It is difficult to establish a set of fixed values since the control on hydraulic oil and its referential values change with the types of hydraulic oil, additives added or not, quality of additives added, listed in the above table are reference only.

Testing items	**Referential value**
Viscosity change	±10%
The increase in total acid value (after decrease)	0.4mg KOH/g
Moisture	0.1% or cloudy
Insoluble compositions	0.05%
Color	Dramatic change
Contamination extent	7mg/100mg

5.2.1.3 Maintenance of hydraulic oil

Following should be checked before the operating process.

◎ Oil level

Under the normal circumstances, the lowest oil level should not be below the middle of the oil level gauge. If the oil level is below the midline, the machine must be shut down immediately for adding oil.

The oil can be added from the inlet of the air filter and must be the same as in the oil tank.

◎ Oil temperature

The machine should not be started when the oil temperature is below 15℃or above 60℃, the hydraulic pump must not be started when the oil temperature is below 0℃, and the normal oil temperature is 40℃-50℃. If the oil temperature is too high during the process of operation, certain measure should be taken to cool down the oil, such as cleaning the cooler, increasing water flow, etc.

◎ Oil pressure

The oil pressure should be kept within the normal range. Too high or too low will cause bad effects to the machine.

◎ Noise of the pump

The abnormal noises may come from the block in the filter, air absorbed into the oil, over high viscosity of the oil or the foreign substances in the pump, etc.

◎ Leakage

Check connections, flange and hoses or leakage arising from the metamorphic sealing materials.

5.2.2 Air filter

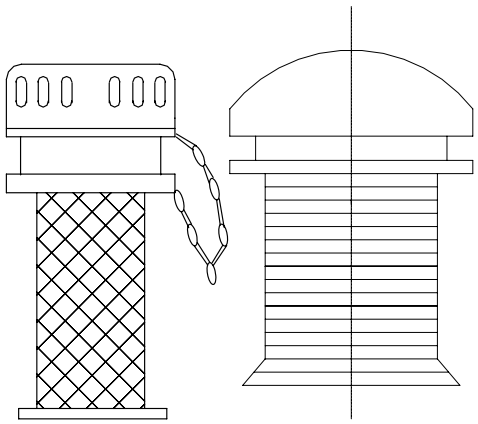


Fig.5-2

First open the cover, change air filter core, then screw and close one. See Fig.5-2.

Note:

Air filter of oil tank is an important useful part. It should be changed after the machine has run about 2000 hours.

The cover of air filter must be screwed in good, otherwise cause leakage.

Do start motor until the air filter is installed correctly.

5.2.3 Oil filter

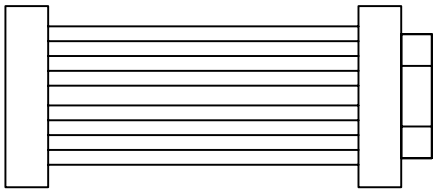


Fig.5-3

The machine is equipped with oil filter. See fig.5-3.

It is need for the machine to clean the oil filter in 6 months under common condition, just change the filter net in 2 years.

5.2.4 High & low soft pipe

After the machine has run 5000hours, have to check as follow:

If inspection any bad condition, must change immediately.

1) Pipe surface has damaged. (Such as friction mark, cut, broken)
2) The surface of pipe have got no flexible,
3) Distortion,
4) Seal function damaged,
5) As the oil pipe has seriously corrupted, to make the function and intensity of ringer of pipe reduced,
6) Exceed working life of pipe.

Note:

If the machine has worked over 20000hours or over five years normally, the all soft-pipes have to change new one.

5.2.5 change of hydraulic oil

Drain up the oil tank:

Note: any oil left in the oil tank will deteriorate the new oil.

◎ Disconnect the cover and clean up the oil tank;

◎ Replace or clean cover;

◎ Put on the oil tank cover;

◎ Drain new oil from the inlet of the sir filter till the oil is leveled above the midline;

◎ Fix the air filter.

Note: Dispose the used oil properly to protect the environment. The new oil must be the same as the used one.

5.3 Cleaning of the barrel and screw

It is necessary to clean up the barrel when new material is used. Normally it's no need to clean up the barrel until color change injection has amounted to 20-30 times. You need to do partial or complete cleaning depending on the contamination.

Cleaning including partial cleaning and complete cleaning.

If the product has got some dirt on the same locality of surface, you should clear nozzle hole and seal surface of barrelhead.

The uneven and thin spots on the products indicate that there exist problems at the hopper entry hole, screw, non-return valve or the nozzle. In this case, the barrel should be cleaned up completely.

5.3.1 partial cleaning

Including cleaning the nozzle, nozzle flanges, screw tip, non-return collets, and spacer.

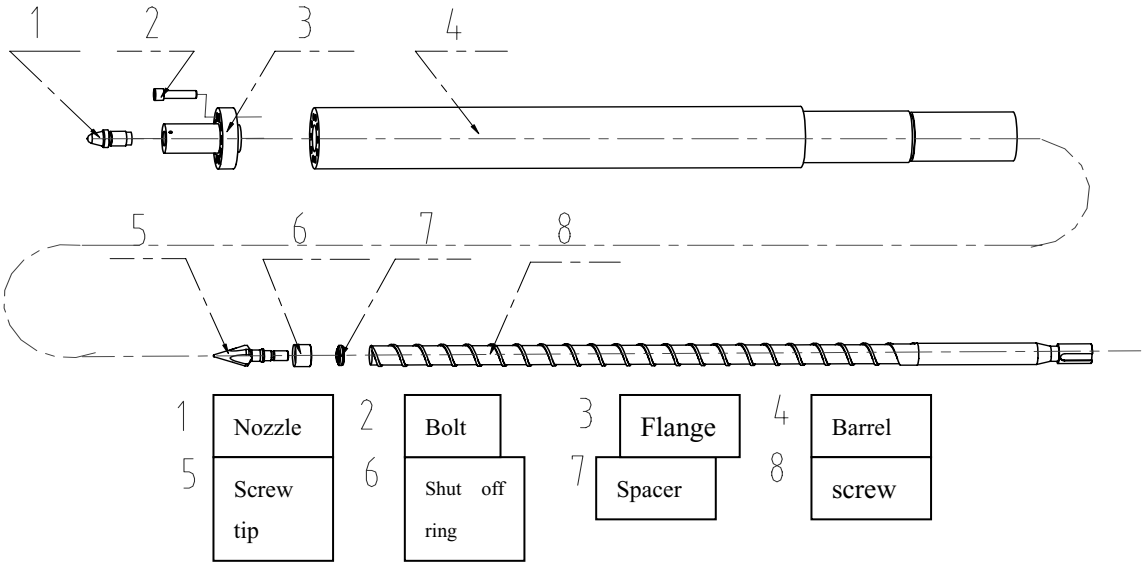


Fig.5-4

Note: the barrel is very hot and might cause burn!

Wear protective gloves and goggles or mask during working.

1) Shut down the heating system of the barrel and off the general power supply;

2) Remove the heater band and disconnect the nozzle, nozzle flanges, screw tip, non-return collets and spacer;

Note: the screw between the screw tip and the screw is left screw.

3) Burn down the plastic material stuck on the nozzle, nozzle flanges, shut-off ring, and thrust ring, spacer with open flame;

4) Clean up all the accessories with steel wire and polish them with a fine abrasive cloth lightly;

Note: do not polish the areas around the sealing face! Keep the sealing face intact.

5) Reinstall the accessories.

☞ **Note**: do not reinstall the accessories until their temperature is as same as that of the plastic melt barrel. Add lubricant before re installation.

5.3.2 Complete cleaning

Including all the accessories in the partial cleaning, and plastic melt barrel and screw. As fig.5-3

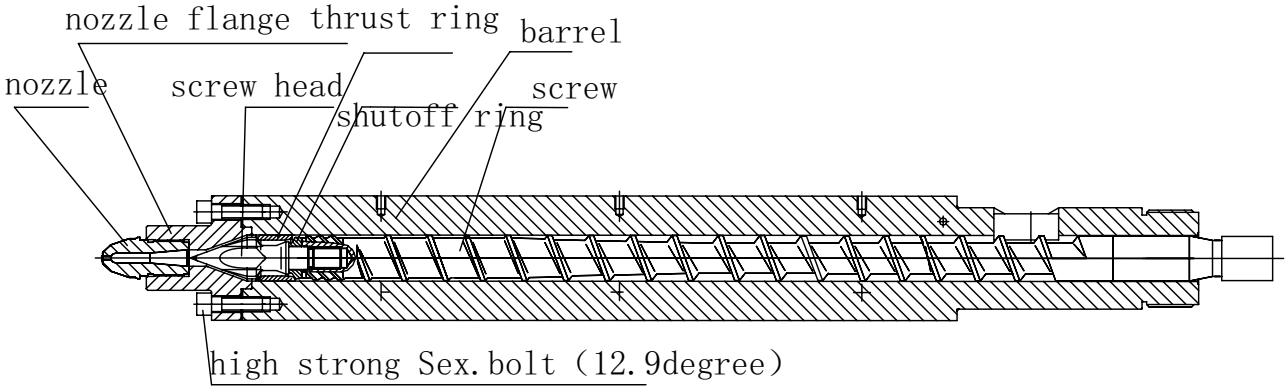


Fig.5-5

5.3.2.1 Clean up the hopper and repeat eject so as to clean up the barrel to as maximum.

☞ **Note**: discharge the material as much as possible and do not cool down the barrel full of plastic absolutely.

Wear protective gloves and goggles against burn during working beside the heated barrel.

Check the temperature of the barrel before displacement.

Turn off the general power supply.

Remove the feed manifold following the above steps.

Wear protective gloves and goggles during working.

Remove heating ring and disconnect the feed manifold handled by experienced personal. If you should need help, please contact us.

Heat various components to clean up plastic residues. For components cleaning, see section titled partial cleaning.

5.3.2.2 Clean up barrel

Heat the barrel until the residual plastics are molten. Be careful not to be burning.

Clean up the residue in the barrel using a wood log wrapped with cloth;

Clear up barrel by steel wire brush enswathed with a cloth.

5.3.2.3 Clean up the screw

The screw must be well protected. The screw should be placed on the wood log. See Fig.5-5.

Heat the screw with the open flame to burn down the residue.

☞ Note: beware of burn! Heat the screw evenly!

Polishing the screw evenly and carefully with fine with emery paper.

☞ Note: do not polish the areas around the sealing face! Protect the sealing face against any damage!

Apply lubricating oil before installation.

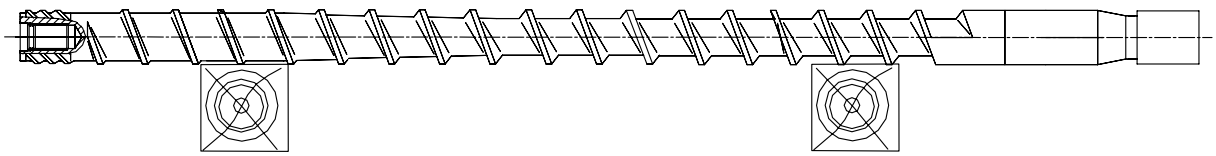


Fig.5-6

5.3.2.4 clean up the screw tip

Turn right screw tip by spanner according to Fig. 5-6. Do not damage shut off ring.

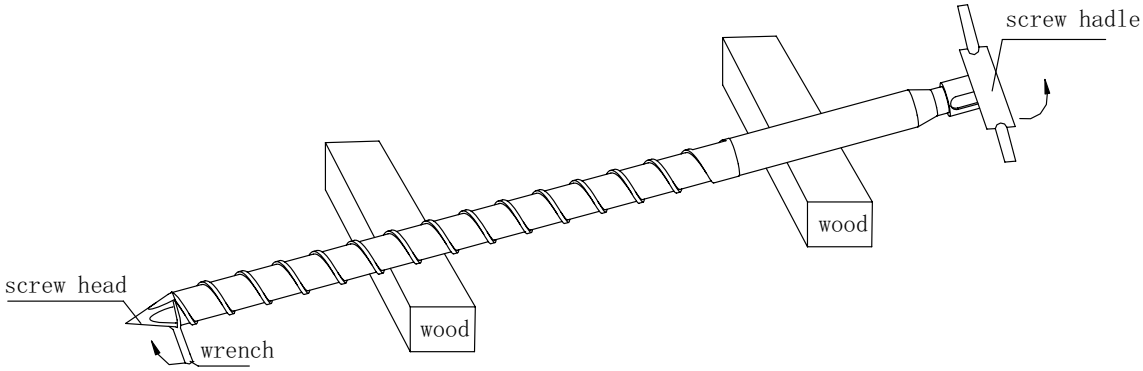


Fig. 5-7

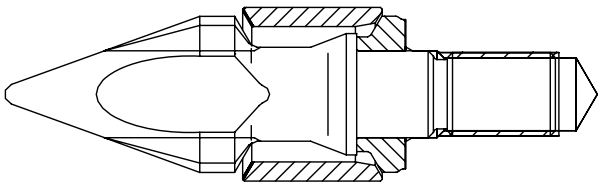


Fig. 5-8

Specially, you must wear protective gloves, eyeglass and face cover during remove hot screw and barrel at repairing. Pay attention shut off ring of screw tip installed position.

5.3.2.5 open nozzle

Burn plastic away from nozzle.

Then clean it with iron brush, and then fine it with fine emery cloth.

Do not grind around of seal surface. See Fig.5-8.

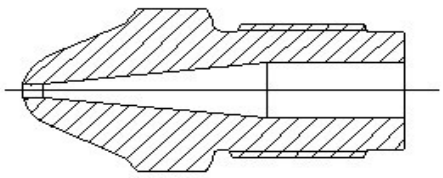


Fig.5-9

5.4 Daily maintenance

Operators should pay attention to the running machine. In case of any emergency, press the emergency stop button on the computer panel immediately and then turn off the main power supply. Do not restart the motor of the oil pump until the fault has been rectified.

During the working the operators should do as following:

◎ Listen

In the event of any defect to the motor, oil pump and bearing, there will be abnormal sound.

◎ Smell

The motor may give out smell if it is burned due to overload, ventilation block, electro-thermal coils and plastic in the barrel.

◎ Observe

Check the lubrication system, oil pipes.

5.4.1 Daily safety check

Open the safety door and check if the safety device works properly before starting the machine;

Check whether the Emergency Stop button works;

Check the surrounding area for any unsafe factors and the machine fro any tools and stains left on it;

Establish a system for checking the safety device periodically.

5.4.2 Daily electrical check

Check the power supply and wires before starting up machine;

Check whether the motor runs normally after starting up the machine;

Check the electrical components;

Inspection and maintenance of the motor should be conducted for every 5000 working hours or at least once a year;

Check the fastening bolts at the connections.

5.4.3 Daily hydraulic system check

Check the oil level gauge to see whether the hydraulic oil is above the centerline;

Check whether the oil in the lube oil tank is above the centerline;

Observe the oil pipe for leakage;

Check the seal in the cooling water pipes and clean it up, if any.

5.4.4 Mechanical system check

Check the product regarding defect and find out the causes;

Adjust the steel band on the tie bar;

Adjust the slide plate supporting the moving platen.

Note: turn off the main power supply before adjustment and hang up the “no power” sign beside the supply.

5.5 Cleaning

Always keep the machine clean.

Before cleaning up the machine, you should:

Turn off the main power supply and put on a “no power” sign nearly.

You are required to:

Clean up the surface of the machine with vacuum cleaner and small emery cloth, including covers, pipes and valves etc.

Clean up the hydraulic oil or grease with yarn rage in time.

Otherwise the metal powders and dust stuck on the oil surface will reduce the mechanical precision and increase wearing,

Clean up the powders stuck around the hopper with vacuum cleaner. Otherwise they will bring the oil into the hopper during the process of maintenance to cause loss of the pump and valves.

5.6 distributing of the heating band

See appendix 4.

5.7 Listing of quick-wear parts

Model	Clamping cylider						
	Head cover	Rear cover			Piston rod	Piston	
	"0 "ring	Oil seal	Dust seal	Wear ring	"0 "ring	Oil seal	Wear ring
LOG90	G55	H605 40×50×6	H839 40×48×5	RYT 2.5×15	P24	H601 50×60×6	RYT 2×10
LOG130	G65	H605 40×50×6	H839 40×48×5	RYT 2×10	P25	H601 60×70×6	RYT 2.5×15
LOG160	G75	H605 45×55×6	H839 45×53×5	RYT 2.5×15	G30	H601 70×80×6	RYT 2.5×20
LOG210	G85	H605 50×60×6	H839 50×58×5	RYT 2.5×15	G35	H601 80×90×6	RYT 2.5×20
LOG250	G90	H605 55×65×6	H839 55×63×5.8	RYT 2.5×15	G40	H601 80×95×8.9	RYT 2.5×20
LOG300	G95	H605 60×70×6	H839 60×68×5.8	RYT 2.5×20	G40	H601 85×100×8.9	RYT 2.5×25
LOG320	G105	H605 65×75×6	H839 65×73×5.8	RYT 2.5×20	G50	H601 95×110×8.9	RYT 2.5×25
LOG400	G110	H605 70×80×6	H839 70×80×6	RYT 2.5×20	G50	H601 100×115×8.9	RYT 2.5×25
LOG500	G125	H605 80×90×6	H839 80×90×6.8	RYT 2.5×20	G65	H601 115×130×8.9	RYT 2.5×25
LOG650	G145	H605 95×110×6	H839 95×105×6.8	RYT 2.5×25	G75	H601 140×155×8.9	RYT 2.5×25

Model	Injection Cylinder							
	Head cover	Rear cover			Piston rod	Piston	Flange	Shaft
	"0 "ring	Oil seal	Dust seal	Wear ring	"0 "ring	Oil seal	"0 "ring	Skeleton seal
LOG90	G85	H605 35.5×45×6	H839 35.5×43.5×5	RYT 2×10	G30	DAS 90×72	G30	SD 125×150×15
LOG130	G95	H605 45×55×6	H839 45×53×5	RYT 2×10	G40	DAS 100×86	G40	SD 125×150×15
LOG160	P105	H605 50×60×6	H839 50×58×5	RYT 2.5×15	G45	DAS 110×92	G45	PD 140×170×16
LOG210	P115	H605 55×65×6	H839 55×63×5	RYT 2.5×15	G50	DAS 125×103	G50	PD 140×170×16
LOG250	P130	H605 60×70×6	H839 60×68×5	RYT 2.5×15	G55	DAS 140×118	G55	PD 160×190×16
LOG300	P140	H605 65×75×6	H839 65×73×5	RYT 2.5×15	G60	DAS 150×125	G60	PD 190×220×15
LOG320	P150	H605 65×75×6	H839 65×73×5	RYT 2.5×15	G60	DAS 160×135	G60	PD 190×220×15
LOG400	P175	H605 85×100×9	H839 85×95×6.8	RYT 2.5×25	G80	DAS 190×165	G80	PD 220×250×15
LOG500	P185	H605 85×100×10	H839 85×95×6.8	RYT 2.5×25	G80	DAS 200×175	G80	PD 220×250×15
LOG650	P205	H605 95×110×9	H839 95×105×7	RYT 2.5×25	G90	DAS 220×195	G90	PD 260×300×20

Model	Ejector cylider						
	Rear cover	Head cover			Piston rod	Piston	
	"0 "ring	Oil seal	Dust seal	Wear ring	"0 "ring	Oil seal	Wear ring
LOG90	G45	H605 28×35.5×5	H839 28×36×4.8	RYT 2×10	P21	H601 40×50×6	RYT 2×8
LOG130	G50	H605 35×45×6	H839 35×43×5	RYT 2×10	P20	H601 45×55×6	RYT 2×8
LOG160	G55	H605 40×50×6	H839 40×48×5	RYT 2×10	G25	H601 50×60×6	RYT 2×10
LOG210	G65	H605 40×50×6	H839 40×48×5	RYT 2×10	G25	H601 60×70×6	RYT 2×10
LOG250	G65	H605 40×50×6	H839 40×48×5	RYT 2×10	G25	H601 60×70×6	RYT 2×10
LOG300	G70	H605 40×50×6	H839 40×48×5	RYT 2×10	G25	H605 65×75×6	RYT 2.5×15
LOG320	G70	H605 40×50×6	H839 40×48×5	RYT 2×10	G25	H605 65×75×6	RYT 2.5×15
LOG400	G85	H605 50×60×6	H839 50×58×5	RYT 2.5×15	G35	H601 80×90×6	RYT 2.5×20
LOG500	G85	H605 50×60×6	H839 50×58×5	RYT 2.5×15	G35	H601 80×90×6	RYT 2.5×20
LOG650	G110	H605 65×75×6	H839 65×73×5.8	RYT 2.5×15	G50	H601 100×115×8.9	RYT 2.5×20

Model	Carriage cylinder						
	Rear cover	Head cover			Piston rod	Piston	
	"0 "ring	Oil seal	Dust seal	Wear ring	"0 "ring	Oil seal	Wear ring
LOG90	G55	H605 30×40×6	H839 30×38×5	RYT 2×10	P30	H601 53×63×6	RYT 2×10
LOG130	G65	H605 35×45×6	H839 35×43×5	RYT 2×10	G25	H601 60×70×6	RYT 2.5×15
LOG160	G65	H605 35×45×6	H839 35×43×5	RYT 2×10	G25	H601 60×70×6	RYT 2.5×15
LOG210	G75	H605 40×50×6	H839 40×48×5	RYT 2×10	G30	H605 70×80×6	RYT 2×10
LOG250	G75	H605 40×50×6	H839 40×48×5	RYT 2×10	G30	H605 70×80×6	RYT 2×10
LOG300	G85	H605 45×55×6	H839 45×53×5	RYT 2×10	G35	H601 80×90×6	RYT 2.5×15
LOG320	G95	H605 40×50×6	H839 40×48×5	RYT 2.5×15	G30	H601 85×100×8.9	RYT 2.5×15
LOG400	G110	H605 55×65×6	H839 55×63×5.8	RYT 2.5×15	G45	H601 100×115×8.9	RYT 2.5×25
LOG500	G110	H605 55×65×6	H839 55×63×5	RYT 2.5×15	G45	H601 100×115×8.9	RYT 2.5×25
LOG650	G85	H605 45×55×6	H839 45×53×5	RYT 2×10	G35	H601 80×90×6	RYT 2.5×15

CHAPTER 6. ASSEMBLY (machinery)

6.1 Clamping unit

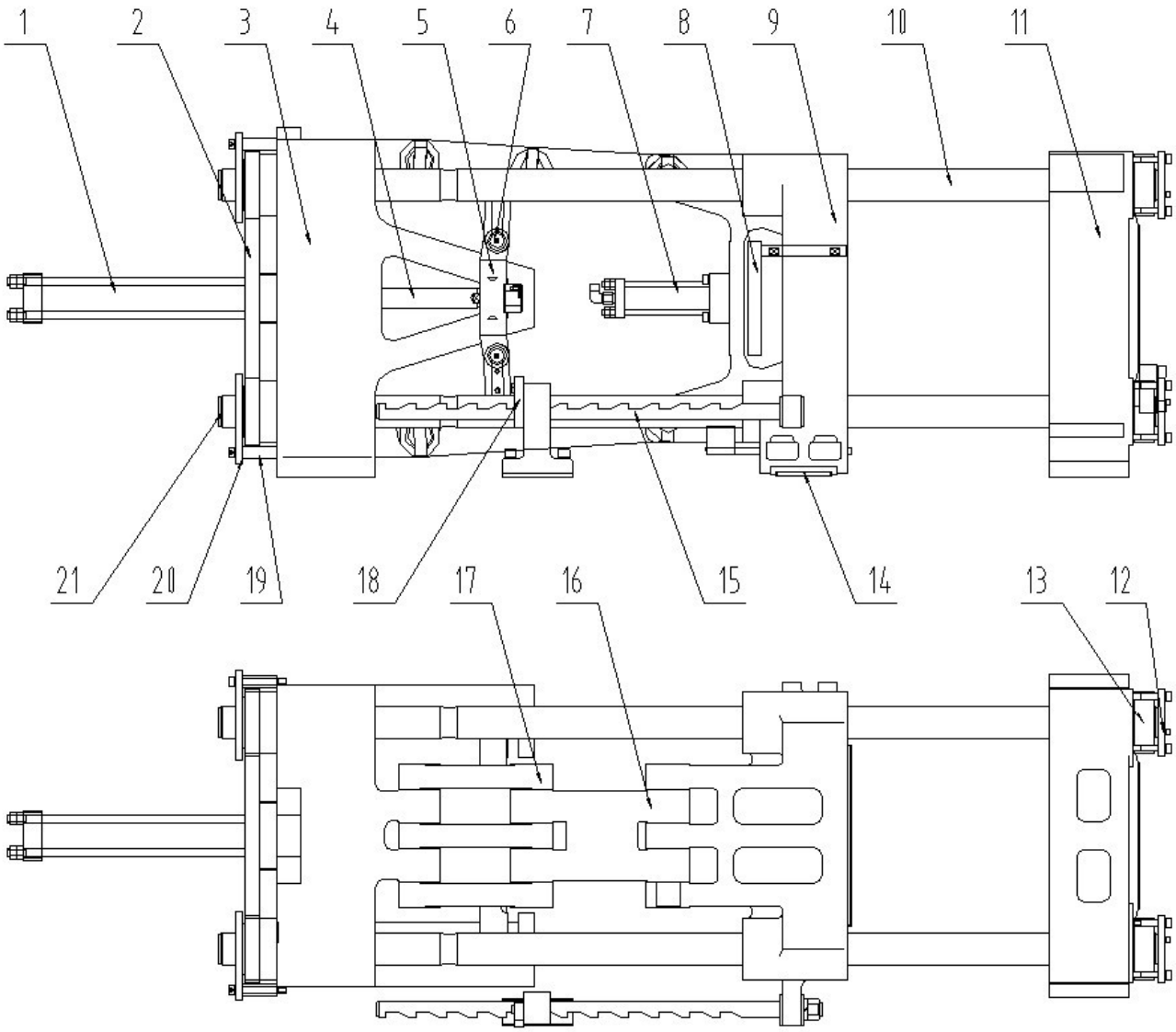


Table 6.1 parts list of clamping unit

Code	Parts name	Quantity
1	Clamping cylinder	1
2	Big mold adjusting gear	1
3	Back mould	1
4	Guide rod of Cross head link base	2
5	Cross head link base	2
6	Small link	
7	Ejecting cylinder	1
8	Guide plate of ejector	1
9	Moving mould	1
10	Tie-bar	4
11	Fixed mould	1
12	Tie bar pressing lid	4
13	Tie-bar nut	4
14	Slide block of moving platen	4
15	Machinery safety rod	1
16	Front link	
17	Rear link	
18	Machinery safety block	1
19	Equals height sleeve of adjust mold gear	12
20	Adjustment screw pressing lid	4
21	Mold adjusting nut	4

6.1.1 clamp cylinder structure

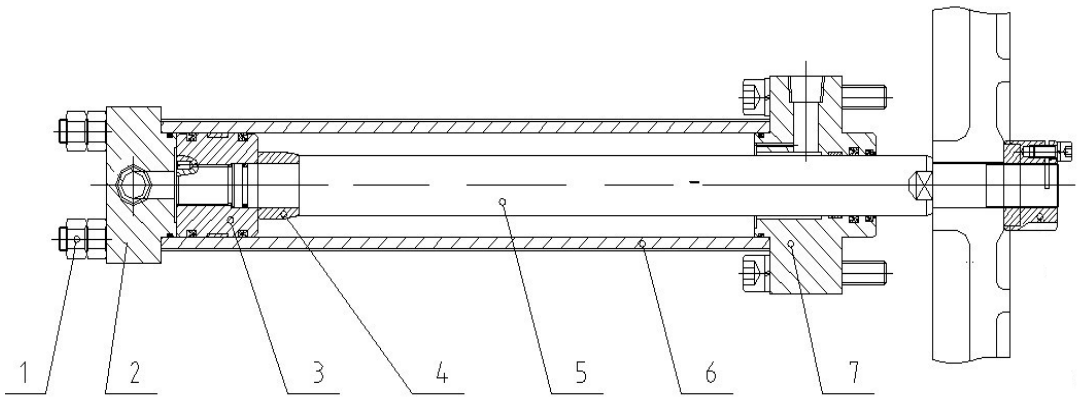


Table 6-2 parts list of clamping cylinder

No.	Part name	Quantity
1	Cylinder tied bar	4
2	Cylinder back lid	1
3	Cylinder piston	1
4	Cushion sets	1
5	Piston rod	1
6	Cylinder	1
7	Cylinder fore lid	1

6.1.2 ejector cylinder structure

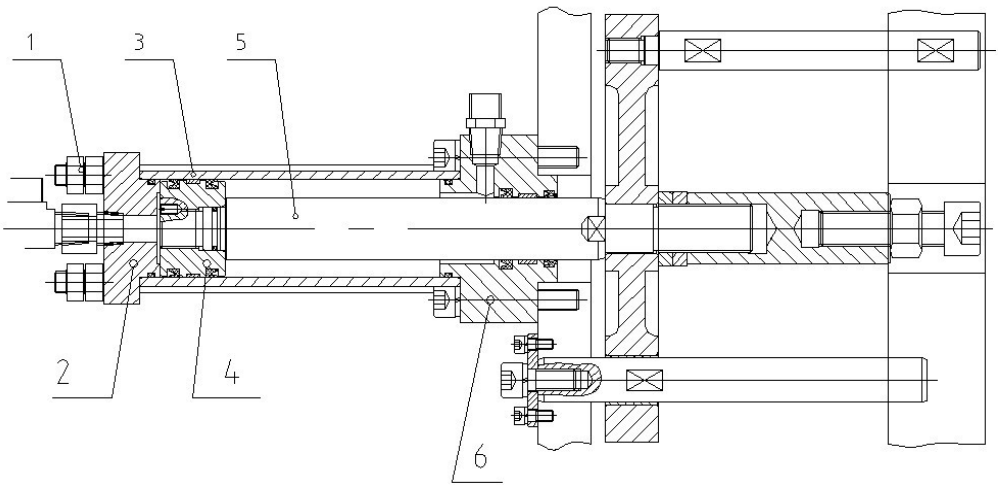


Table 6-3 parts list of ejector cylinder unit

No.	Part name	Quantity
1	Cylinder tied bar	4
2	Cylinder back lid	1
3	Cylinder	1
4	Cylinder piston	1
5	Piston rod	1
6	Cylinder fore lid	1

6.2 Injection unit

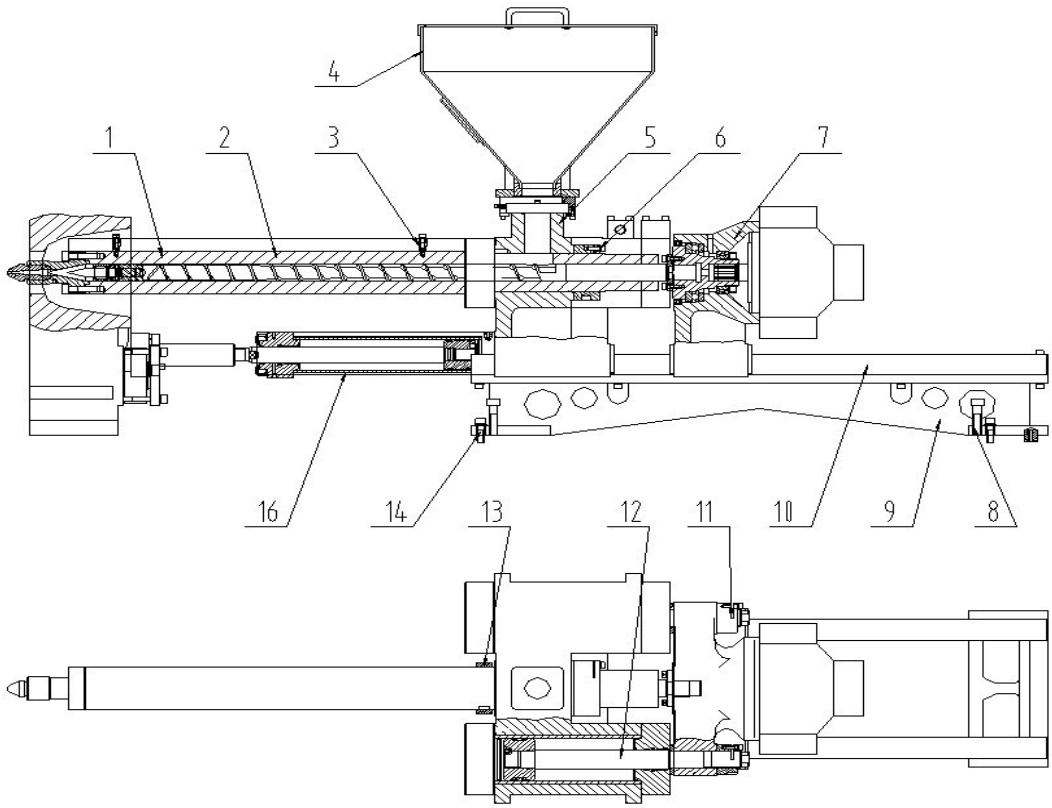


Table 6-4 carriage unit parts list

Code	Parts name	Quantity
1	Barrel subassembly	1
2	Barrel cover	1
3	Bracket	2
4	Hopper subassembly	1
5	Screw barrel base	1
6	Barrel locking nut	1
7	Screw drive base	1
8	Carriage positioning screw	4
9	Guide bar holder (right)	1
10	Guide bar	2
11	Injection cylinder piston nut	2
12	Injection cylinder piston	2
13	Cooling water hose joint	2
14	Location block	2
15	Guide rod holder (left)	1
16	Carriage cylinder subassembly	1

6.2.1 Carriage cylinder structure

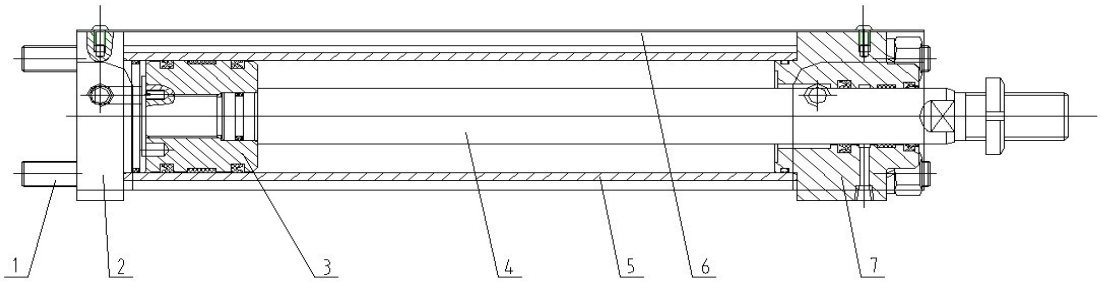


Table 6-5 carriage cylinder parts list

No.	Part name	Quantity
1	Cylinder tied bar	4
2	Cylinder back lid	1
3	Cylinder piston	1
4	Piston rod	1
5	Cylinder	1
6	Cylinder cover	1
7	Cylinder fore lid	1

6.2.2 Injection cylinder structure

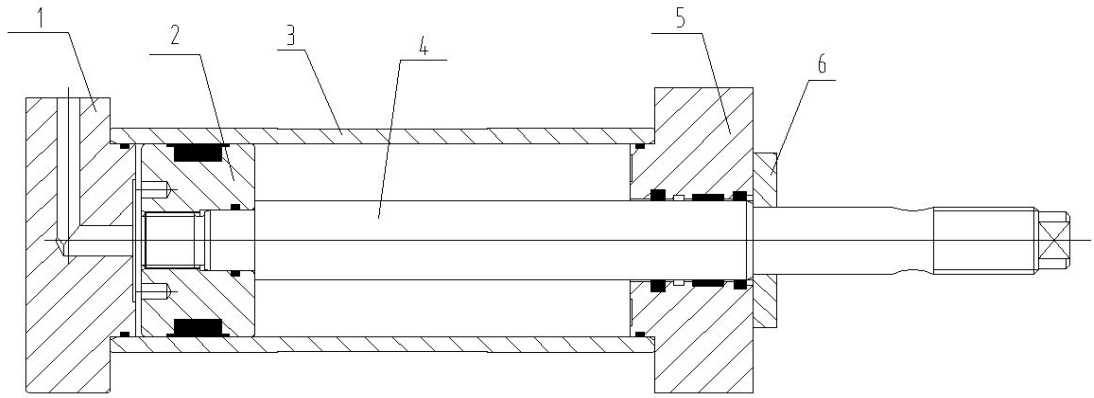
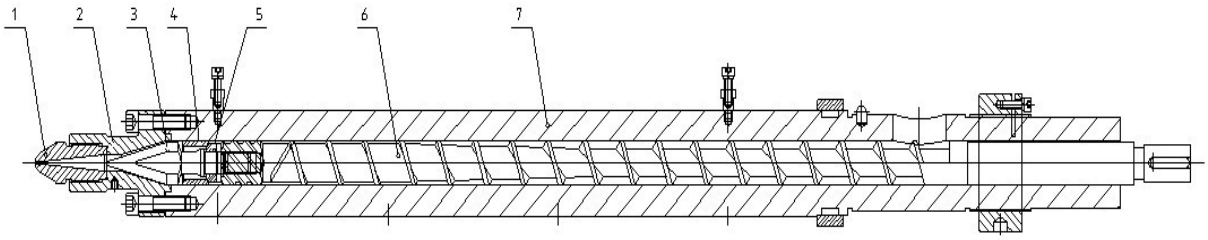


Table 6-6 Injection cylinder parts list

Code	Parts name	Quantity
1	Cylinder fore lid	1
2	Cylinder piston	1
3	Cylinder	1
4	Piston rod	1
5	Cylinder back lid	1
6	Cylinder pressing lid	1

6.3 Screw structure



DKM screw and barrel parts list

No	Part	Quantity
1	Nozzle	1
2	Fore Barrel head	1
3	Screw head	1
4	Shut off ring	1
5	Driving ring	1
6	Screw	1
7	Barrel	1

Chapter 7 Injection parameter of thermoplastic plastics

Parameter \ Description			LDPE	HDPE	PP	ABS	PA6	PA66	PMMA
Processing features			Excellent processing performance	Excellent processing performance	Excellent processing performance	Good processing performance	Generally same for polyamide plastic	Likely to wear the machine	High melt viscosity.
Drying condition	Temperature/ ℃		--	--	--	70-80	--	85-100	80-90
	Time/ h		--	--	--	4-8	--	8-24	2-8
Temp. ℃	Barrel	Back	160-180	140-160	160-180	150-170	200-210	230-240	160-180
		Middle	160-170	180-190	180-200	165-180	230-240	270-280	
		Front	170-200	190-220	200-230	180-200	230-240	250-260	210-240
	Nozzle		170-180	170-190	180-190	170-180	200-210	250-260	180-200
	Mould		--	30-60	20-60	40-70	60-100	110-120	40-80
Injection pressure/ Mpa			50-100	70-100	70-100	80-100	80-100	80-130	80-130
Molding Cycle/s	Injection time	Holding pressure	15-60	15-60	20-60	20-90	15-50	20-60	20-60
		High pressure	0-3	0-5	0-3	0-5	0-4	2-5	0-5
		Cooling time	15-60	15-50	20-90	20-120	20-40	20-60	20-90
Screw speed /r min^{-1}			<80	30-60	<80	<70	20-50	30	--
Heat treatment	Temperature/℃		--	--	--	70	--	100-120 (oil and water)	--
	Time/h		--	--	--	2-4	--	0.5-1	
Remarks						Heat treatment if necessary			

Chapter 7 Injection parameter of thermoplastic plastics

Parameter \ Description			PMMA/PC	POM	PBTP	PBTP	PC
Processing features			High melt viscosity and good processing performance	Strict temperature control required to prevent decomposing	Low viscous melt, quick crystallization and sharp melting point	Strict temperature control required to avoid over high temperature and long stay	High-melt viscosity and vitrified temperature, short and thick running channel, strict process control.
Drying condition	Temperature/ ℃		--	90-100	120-130	105-110	110-120
	Time/ h		--	4-6	3-5	>8	>24
Temp. ℃	Barrel	Back	210-230	160-170	160-180	210-230	220-240
		Middle	240-260	170-180	230-240	230-240	230-280
		Front	230-250	180-190	220-230	250-260	240-285
	Nozzle		220-240	170-180	210-220	210-230	240-250
	Mould		60-80	70-120	70-120	80-110	70-120
Injection pressure/ Mpa			80-130	68-130	50-600	60-100	70-150
Molding Cycle/s	Injection time	Holding pressure	20-40	20-90	15-60	10-40	20-90
		High pressure	0-5	0-5	0-5	0-10	0-5
		Cooling time	20-40	20-60	15-30	20-60	20-90
Screw speed /r min $^{-1}$			20-30	28-43	20-30	29	28-43
Heat Treatment	Temperature/℃		--	140-150		170-175	120-125
	Time/h		--	1-4		2-3	1-4
Remarks				Copolymerized formaldehyde	PBT		

CHAPTER 8 Causes and trouble shootings for some Injection molding defects

Based on our experience in the maintenance and operation of our product, we append below information concerning various machine failures/ defects and the relative trouble shootings for customer's reference. In order to reduce the machine breaks down period, and to find out the cause of defects as soon as possible, operator should try to keep a record of the best injection molding parameters in a special designated record book for reference only, out company is not responsible for its perfect accuracy and completion, it is at the machine user's sole discretion to determine the application of the given solutions.

8.1 Clamping units

Fault	Cause	Solving method
1. The machine sounds cacophony at opening and closing mold	1 oil amount of lubrication too small	1.take time of lubrication longer. 2.clean lubrication oil circuit
	2.clamp force too heavy	Adjust clamping force lower according product quality
2.open mold too low	Starting speed too low	1. Adjust flow proportion larger on the menu.
3.creeping of opening and closing mold	1. Leader supported moving platen and tie bars wear out heavily.	Change wears out parts and often lubricate machine.
	2. Level and vertical between two platens	1.setting leader levelly. 2.adjust slide of moving platen to make tie bar straight.
	3.the opening mold speed and pressure setting data are wrong	1.exhaust air gas. 2. Adjust flow and pressure proportional. 3. Set current data of proportion valve
4. Fault of adjustment mould counter	1.proximity switch is bad	Change switch, setting position
	2.adjusting mold travel time too short	Adjusting molds stroke time.
	3.adjustment nut blocked	Change burned parts and set clearance of adjustment mold nut
5.big oil pump do not unload	1.hydraulic valve blocked	Clean pressure valve or reconnect
	2.unloading time too short	Extend unloading time
	3.Speed and pressure of unload too small or nothing	Raise speed and pressure of discharge
6.after clamping, the mold is auto opened slowly at other operation	Opening mold valve is leakage	Change opening mold valve
7. During clamping, the moving platen no closed	Wire connecting error	Check and reconnect them

Fault	Cause	Solving method
8. High pressure of clamping not receive	Set Mold height improper	Adjustment moving platen forward
9.only have speed and no pressure at clamping	High pressure stroke switch does not work	Check the switch and repair or change it
10. Clamping blocked	There is air in the oil circuit	Exhaust
11 Not control to open mould fast or slow	The Relay on program plate is wrong	Change relay
12.no adjust mold	1. The clearance between pressing lid of adjusting nut and nut is too small	Adjustment the clearance between lid and nut
	2.screw thread gnaws dead	Change nut, or repair the screw
	3.the slide of moving moves too heavy	Adjustment moving slide again
	4. The motor use for adjusting mould does not work.	Check adjustment valve, if bad change or repair it
	5.proximity switch, relay and contactor are burned	Check 3-phase voltage, and change these parts
	6.the wire interrupt or connect bad	Check control wire and each contact, then reconnect
13.the sound is too high when opening mold	1. Lubricates of clamping structure are worse	Check steel sleeve and shaft with locking, if wear out, change it.
	2.clamping force is too large	Adjust suitable clamping force.
	3. Parallel between mold and moving platen is bad	Set moving platen and increase mold parallelism
	4.exchange time is too short from low to quick speed	Add Propriety opening mold time

8.2 Injection units

Fault	Cause	Solving method
1. The motor oscillating at plasticizing	1.gearing damaged	Change gearing
	2.setting clearance between gearing improper	Check transmission shaft shaking or not at plasticizing, reset the clearance.
	3.screw distortion	If screw bend change screw
	4.copper bushing of carriage wear out heavily	Check copper bushing and leader and change them
2. Not injecting	1.winding of solenoid valve is burned	Check and change it
	2.valve core blocked by dirt thing	Clean or change solenoid valve
	3.pressure of injection is too low	Set injection pressure
	4. The temperature of material barrel is too low	Check, change fuse and reset temperature of material barrel
	5. Piston seal ring of injection cylinder damaged	Check seal ring and change one
	6.shut off ring broken	Check and change the ring
	7.nozzle blocked	Clean nozzle or change it
3.not feeding	1.back-pressure valve damaged or back-pressure too high	Change backpressure valve or adjust pressure lower
	2.the cooling water of barrel are not enough, temperature of hopper is too high	Clear plastic block feel in the hopper, in the barrel, increase cooling water capacity.
	3.no material in the hopper	Check and charge the material
	4.screw and barrel wore out	Check and change it
4.carriage do not moves	1.piston bar broken	Remove locking nut and change piston bar
	2.direction valve of carriage is no working	Clean it
	3. Electricity wire disconnected	Change winding of solenoid valve or connect wire
5. The noise of injection loudly at beginning injection	1.beginning speed of injection too quick	Adjustment setting value on the menus
	2.backpressure too high	Decrease backpressure
	3.there are air in the oil circuit	flow and pressure proportion valve
6. The noise of beginning plasticizing is loudly after injection	Exchange fast/low speed over fast	1. Raise backpressure or increase injection section step 2. Raise holding pressure, add plasticizing time
7.back-pressure not set at plasticizing	Bad back-pressure valve	Clean back pressure valve or change it
8. It have some black points on the product	1. There are leftover on the screw	Clean and polishing screw
	2. There are some leftover on the barrel, or accessory hasn't clean	Clean accessory and polishing barrel

	3. Some parts are dirty and rust such as suck off ring, thrust ring screw tip, materialcylinder	Clean, polish and change them
	4. Have leftover on the flange and nozzle	Clean, polish and change them
	5. Temperature is too high, backpressure of charging is too high	Check each section temperature, and fall down, decrease backpressure.
	6.raw material are dirt	Check and change them
9.screw mixes color poor	1.material have problem	Change
	2.temperature too low	Check and increase it
	3.back pressure too low	Raise it
	4.screw rotation speed too low	Add the speed
	5. Diffuse quantity of oil is too small	Add them
10.no injection at semi automatic operation	1. The platen do not clamp to end at the carriage forward end	Check stroke switch and connect wire
	2.wire broken	Reconnect it
	3.relay inserted wrong	The relay insert Correctly
	4. No zero on the computer	Reset zero position on the menu
	5.time relay is worse	Change it
11. barrel temperature exceed setting value when semi auto or automatic operation	1.screw rotation speed too fast	Adjust the screw speed
	2.backpressure too high	Increase it
	3.screw and barrel worn	Check and change them
	4.temperature setting improper	Reset the temperature
	5.the temperature at plastic cutting too high (specially ABS)	Adjustment screw rotation peed and backpressure lower
12.it has injection action only at semi-auto operation	Injection time relay is wrong	Check the time relay and change one
13. semi automatic operation failure	Because electricity switch or time relay no working	Find fault according to action diagram or change electricity part
14.full automatic operation failure	1.sensor is failure or fixed bolts loosen	Fix the sensor’s bolt well or change it
	2.time relay failure or damaged	Check time relay and change it
	3.thermocouple connect poor or damage	Change or reconnect it
	4. Heating ring damaged	Change it
	5.temperature gauge damaged	Check and change it

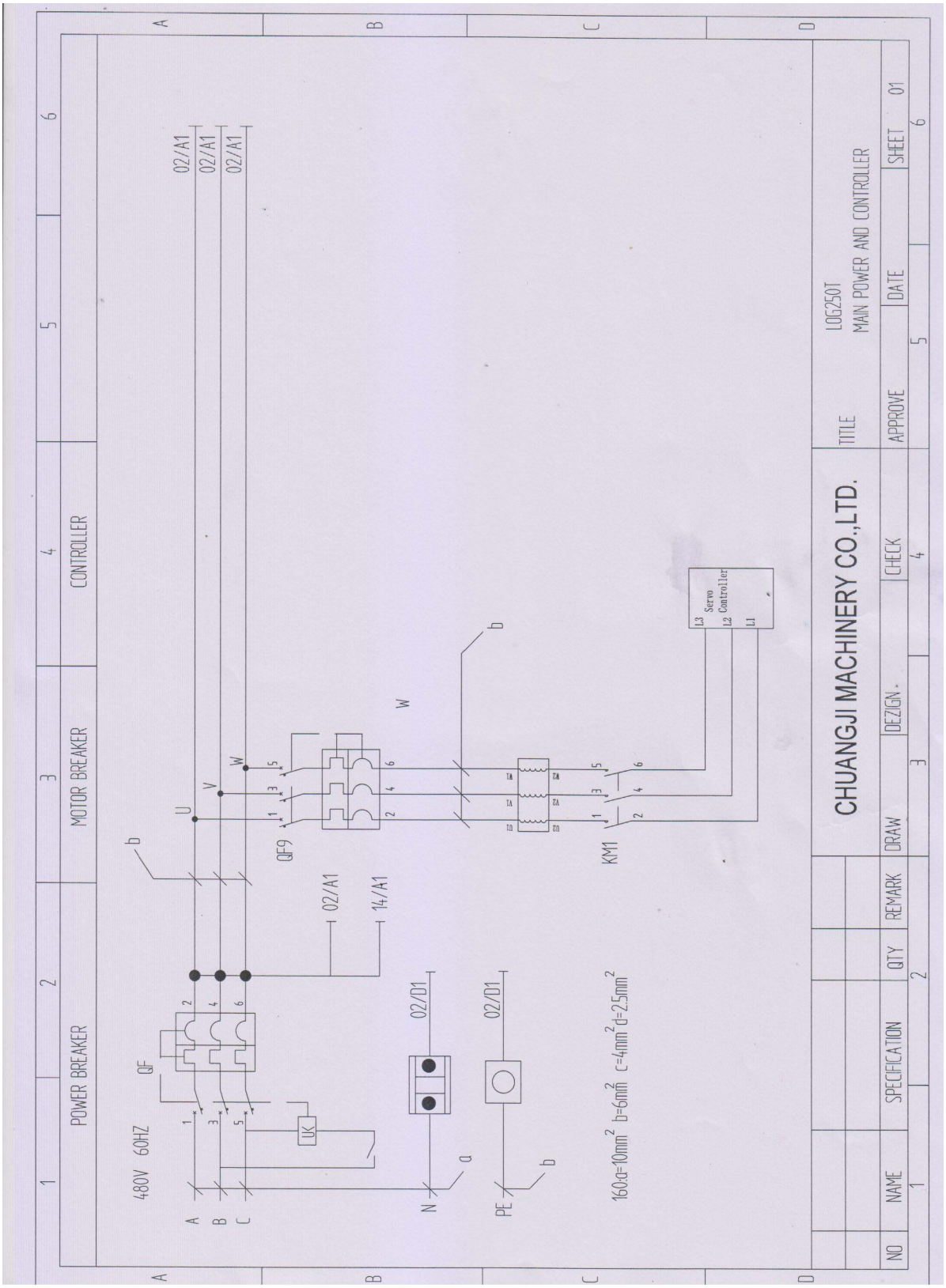
8.3 hydraulic and electricity units

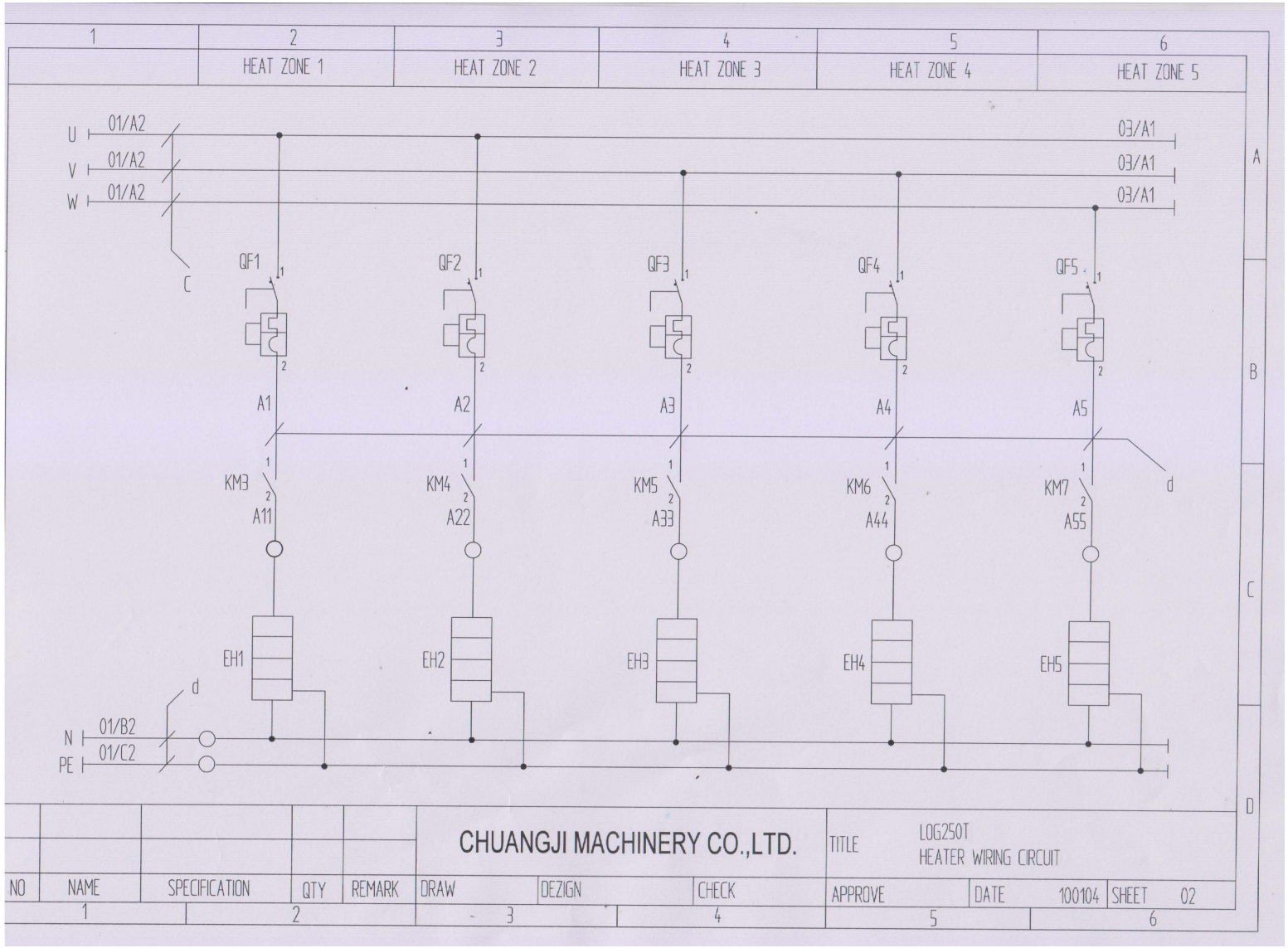
Fault	Cause	Solving method
1.pressure and oil temperature too high	1.the oil leveling line too low	Filling hydraulic oil enough
	2.pressure too high at no load	Set pressure at no load to 1.5Mpa
	3.water temperature is over high	Clean water scale and add water flow capacity or clean water
2. Flow and pressure do not proportion	1.transformer connected bad	Measure transformer output by omnipotence meter or reconnect it
	2.wiring wrong	Measure connecting wire point by omnipotence meter and reconnect it
	3.number control grid weld fails	Measure connecting point by omnipotence meter and weld again
3.the machine shakes heavy	1.fixed bolt of main motor loose	Tighten the bolts
	2.body and guide of machine not level	Adjust the parallelism and beeline
4.the action of machine too slow	1.current set fail	Check current of flow and pressure and reset it
	2.flow valve blocked	Clean flow valve
	3.system pressure too low	Adjust system pressure
5.no action of machine	1. Amplificatory board no output	Measure output voltage of amplificatory board, and check no voltage, change the board.
	2.fuse burn out	Check or change commutator fuse
	3.oil pump motor rotation reversion	Exchange two phase
	4.join device between oil pump and motor	After switch off change it
	5.pressure valve blocked no pressure	Clear pressure valve, and change hydraulic oil and filter
	6.24V power wire broken	Measure and reconnect them
	7.oil pump motor burn out and not start	Measure motor winding by omnipotence meter Change motor
	8. Oil pump is wrong, not retraction oil and increase pressure	Remove oil pump and check Change oil pump
	9. be wanting one phase at three-phase of electricity power.	Check 380V input voltage Reconnect it
6.machine operate without force	1. The relief valve blocked and often release oil	Check relief valve and Clean the valve
	2.oil seal ring wear out	Check each oil cylinder, piston and oil seal ring or change
	3.oil pump wear out	Remove oil pump and check
		Change oil pump
	4.preportion valve wear out	Check and Change proportion valve

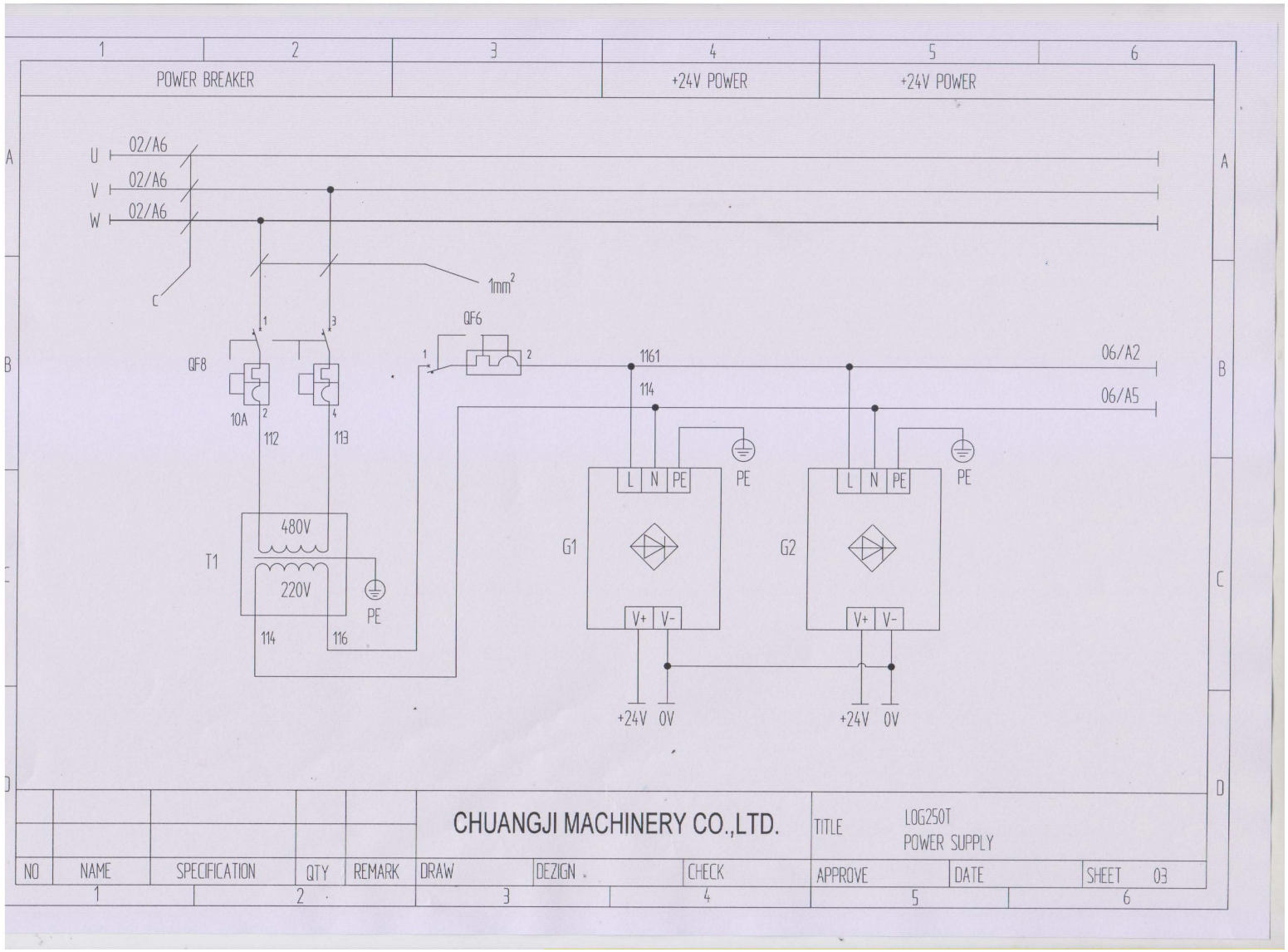
7.the current value is up to maximum during no action	1.magnify plate no output	Measure it by omnipotence meter And repair or change it
	2. Winding of solenoid valve connect machine frame	Measure grounding point by omnipotence meter and change it
	3. There is some water in the magnify plate	Clean it
8.temperature control failure	1.temperature control gauge is wrong	Measure by omnipotence meter Change temperature control meter
	2.thermocouple is wrong	Check each section thermocouple Change thermocouple
	3. During charging, the barrel and screw are too hot to make the heating band broken.	Measure heating band Change heating band
9. Not replacement at semi auto or automatic operation	1.limit switch of safety door is bad.	No pressure after finished semi or full automatic
	2.relay insert wrong	Insert relay exchange and check
	3. Ejector is not retract end	Check program, Adjustment or change end switch
10. The noise too loud when motor starting	1.Wanting one phase at three-phase of electricity power.	Measure 3-phase voltage and connecting wire
10. The noise too loud when motor starting	2.exchange-button has not replacement at starting with action.	Check each selected button Replace switch to original position
	3.preportion valve and relief valve core blocked	Check valve and Clean valve core
	4. Oil pump is worn out	Remove pump and check Change oil pump
11.oil pump sound too laud after period production	1.filter net has dirty	Clean filter and change oil
	2.quality of absorb oil pipe is poor	Check absorbing oil pipe, Change oil pipe, filter net
	3.oil pump worn out faster	Check and change oil pump

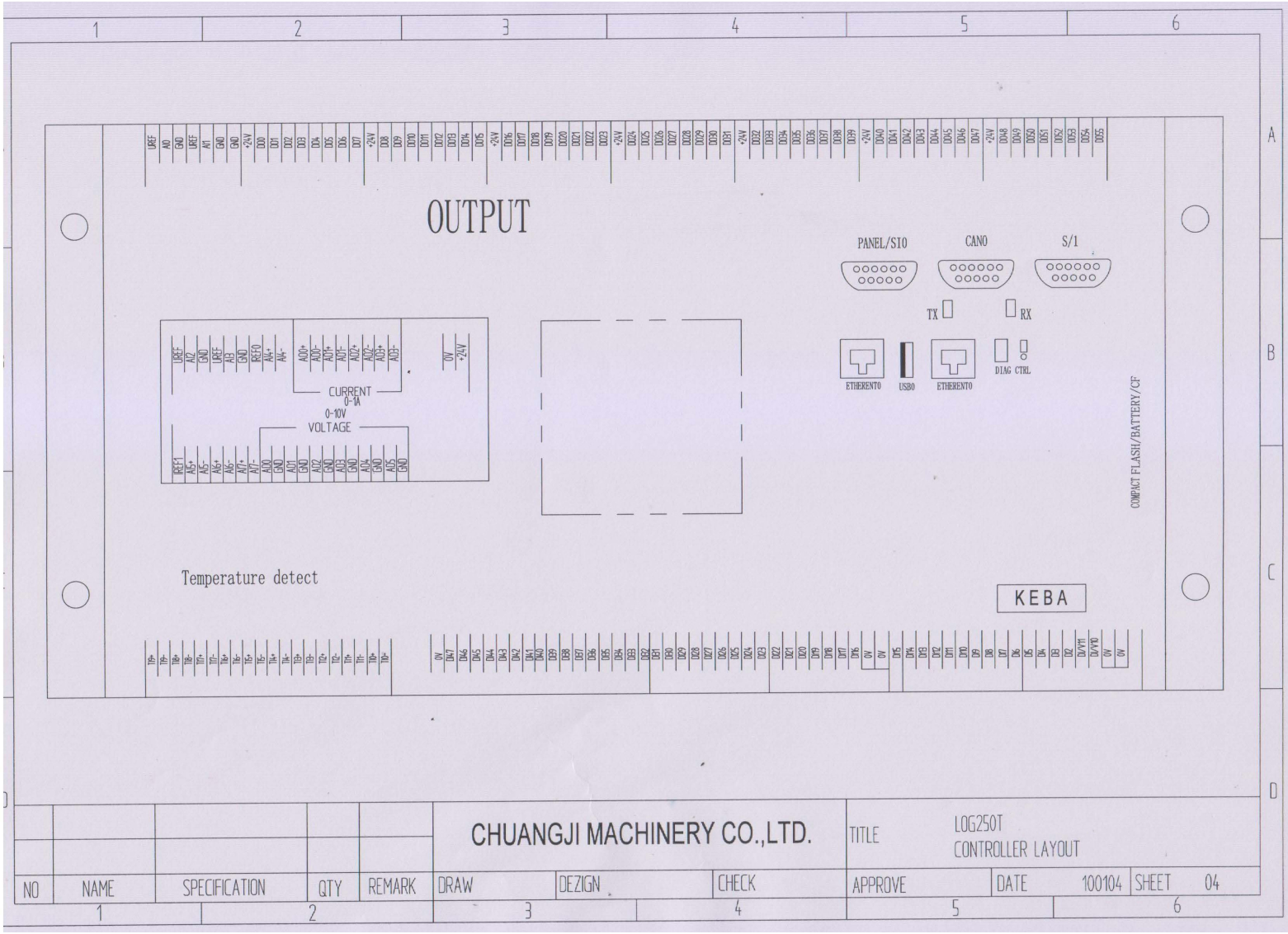
CHAPTER 9. Attachments

9.1 electric circuit




1
2
HEAT ZONE 1
3
HEAT ZONE 2
4
HEAT ZONE 3
5
HEAT ZONE 4
6
HEAT ZONE 5
A
B
C
D
U
V
W
01/A2
01/A2
01/A2
C
03/A1
03/A1
03/A1
QF1
QF2
QF3
QF4
QF5
A1
A2
A3
A4
A5
KM3
KM4
KM5
KM6
KM7
A11
A22
A33
A44
A55
d
EH1
EH2
EH3
EH4
EH5
N
PE
01/B2
01/C2
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
HEATER WIRING CIRCUIT
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
100104
SHEET
02


1
2
3
4
5
6
POWER BREAKER
+24V POWER
+24V POWER
U
V
W
02/A6
02/A6
02/A6
C
1mm²
QF8
10A
QF6
112
113
1161
114
06/A2
06/A5
T1
480V
220V
PE
114
116
G1
G2
L
N
PE
V+
V-
+24V
0V
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
POWER SUPPLY
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
SHEET
03



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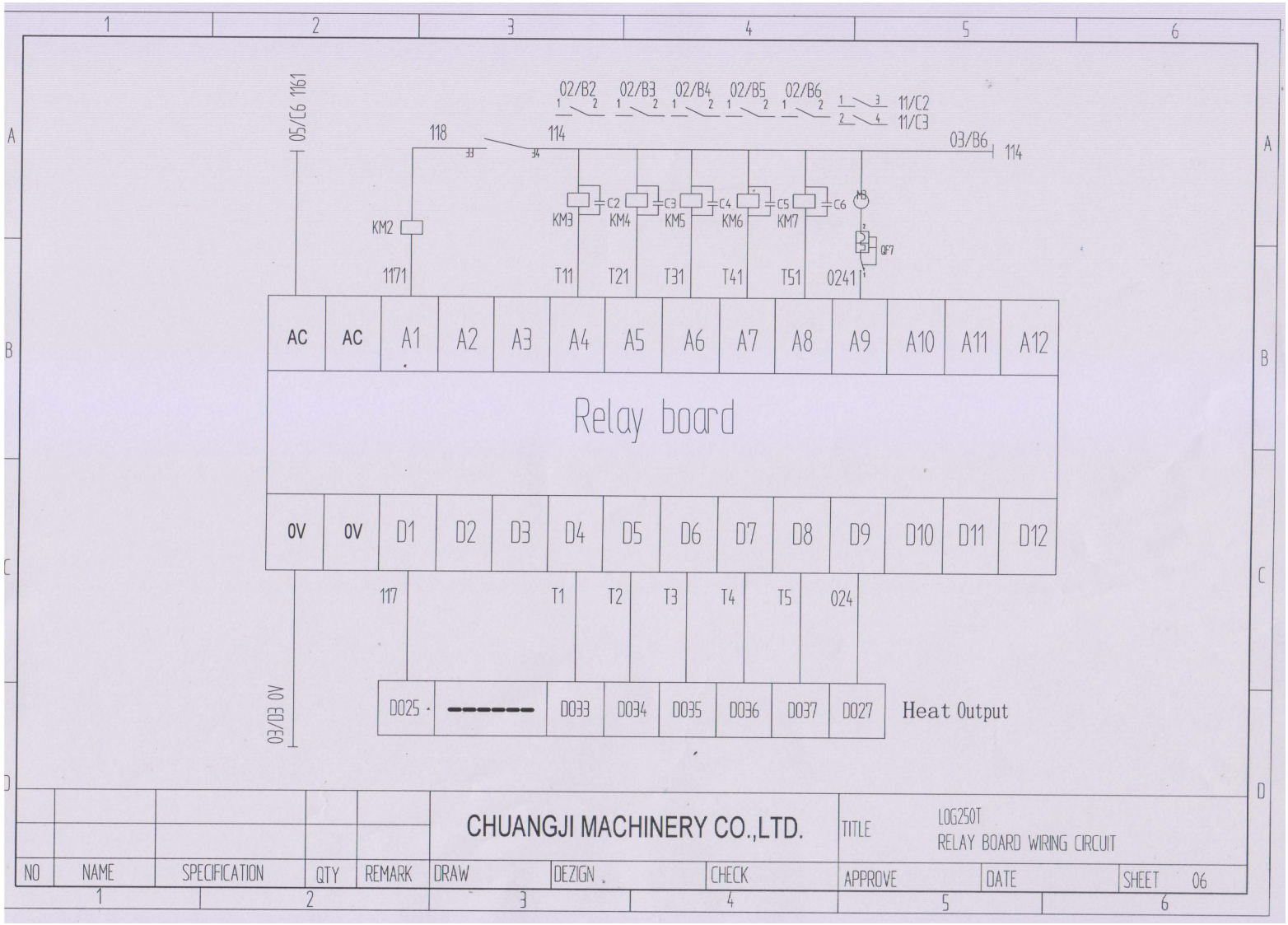
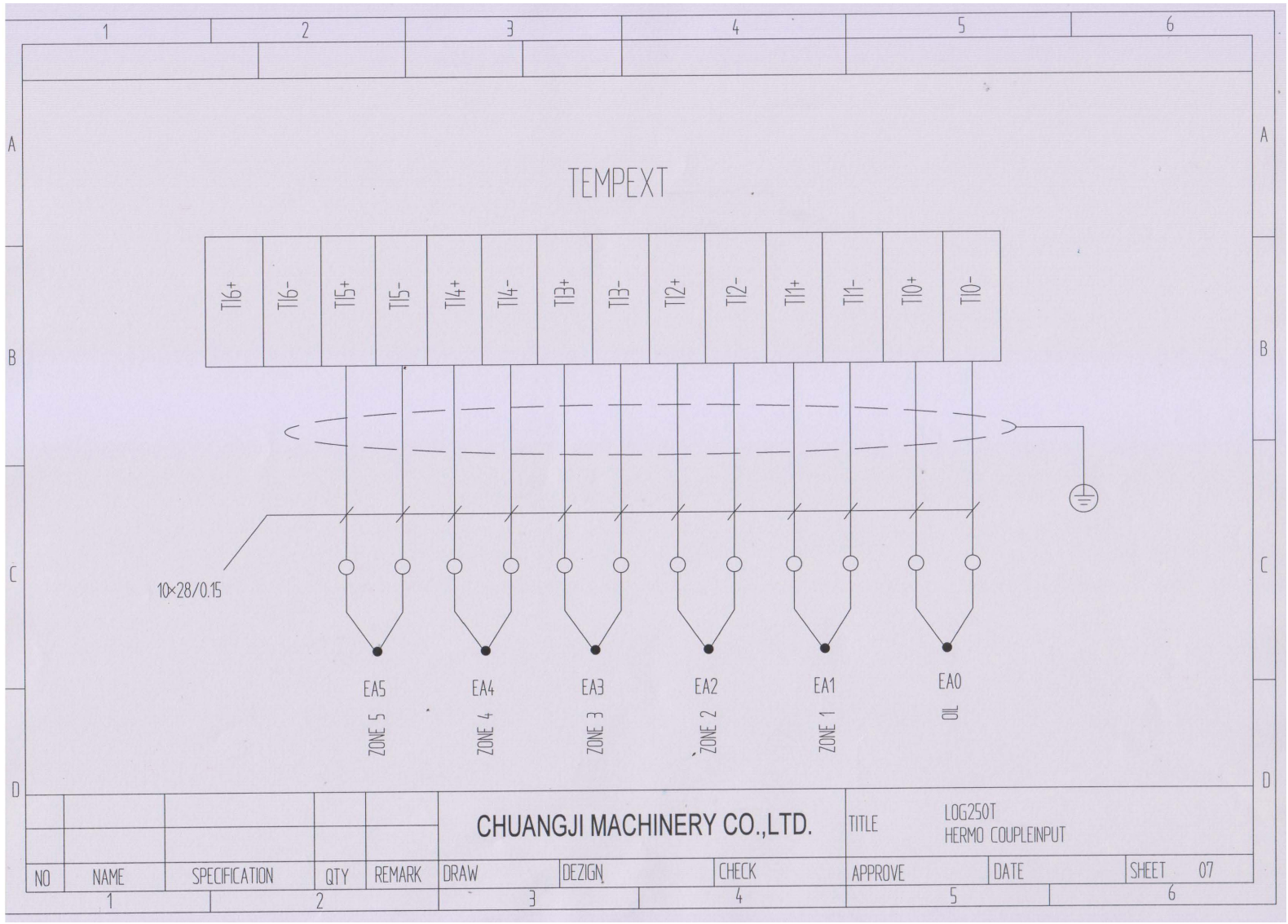
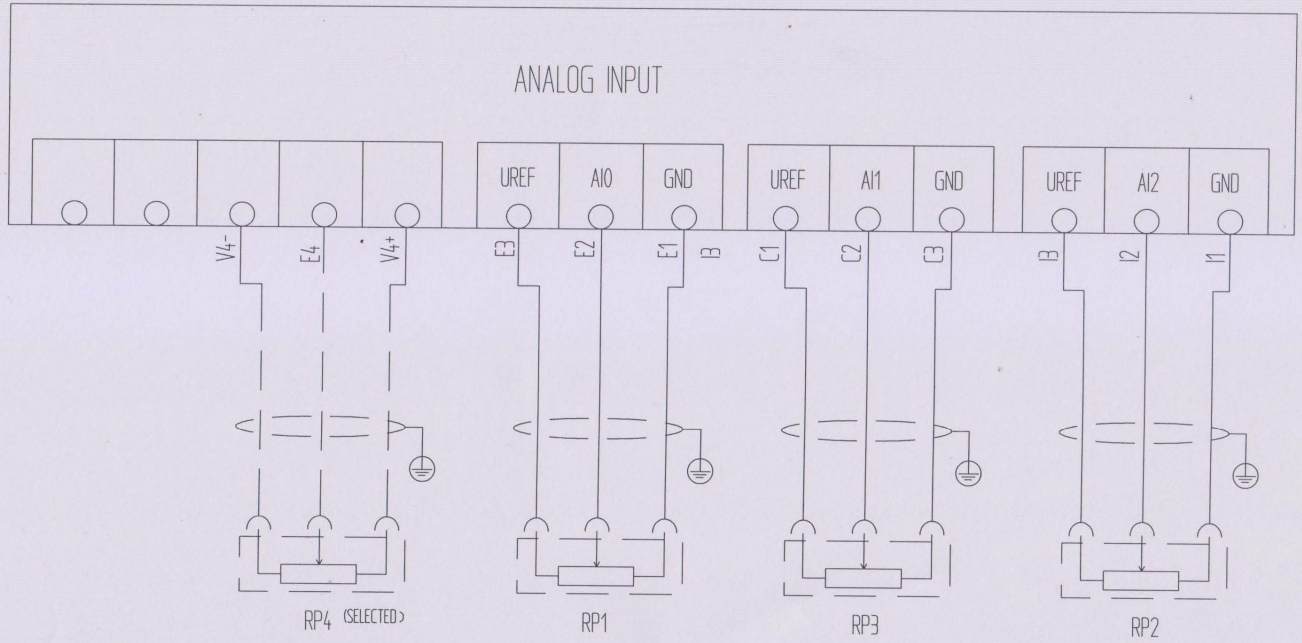

02/B2
02/B3
02/B4
02/B5
02/B6
11/C2
11/C3
05/C6 1161
118
114
03/B6
114
KM2
KM3
KM4
KM5
KM6
KM7
C2
C3
C4
C5
C6
QF7
1171
T11
T21
T31
T41
T51
0241
AC
AC
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
Relay board
0V
0V
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
117
T1
T2
T3
T4
T5
024
03/03 0V
D025
D033
D034
D035
D036
D037
D027
Heat Output
CHUANGJI MACHINERY CO.,LTD.
TITLE
L0G250T
RELAY BOARD WIRING CIRCUIT
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
SHEET
06


TEMPEXT
T16+
T16-
T15+
T15-
T14+
T14-
T13+
T13-
T12+
T12-
T11+
T11-
T10+
T10-
10×28/0.15
EA5
ZONE 5
EA4
ZONE 4
EA3
ZONE 3
EA2
ZONE 2
EA1
ZONE 1
EA0
OIL
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
HERMO COUPLEINPUT
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
SHEET
07

CARRIAGE POTENTIOMETER	EJECTOR POTENTIOMETER	CLAMP POTENTIOMETER	INJECTING POTENTIOMETER



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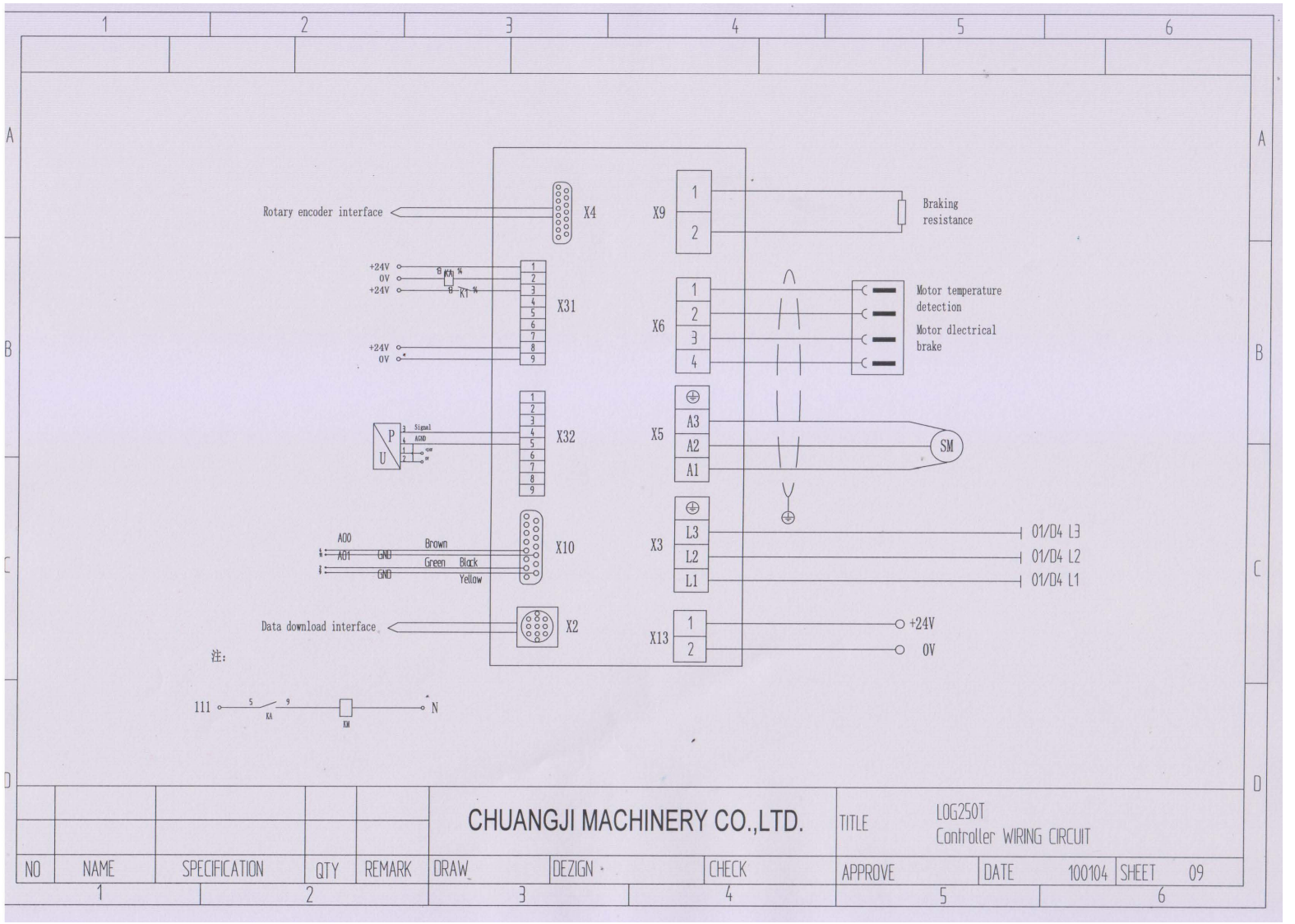
DRAW	DEZIGN	CHECK
APPROVE	DATE 100104	SHEET 08

CHUANGJI MACHINERY CO.,LTD.

TITLE LOG250T
LPM INPUT WIRING CIRCUIT



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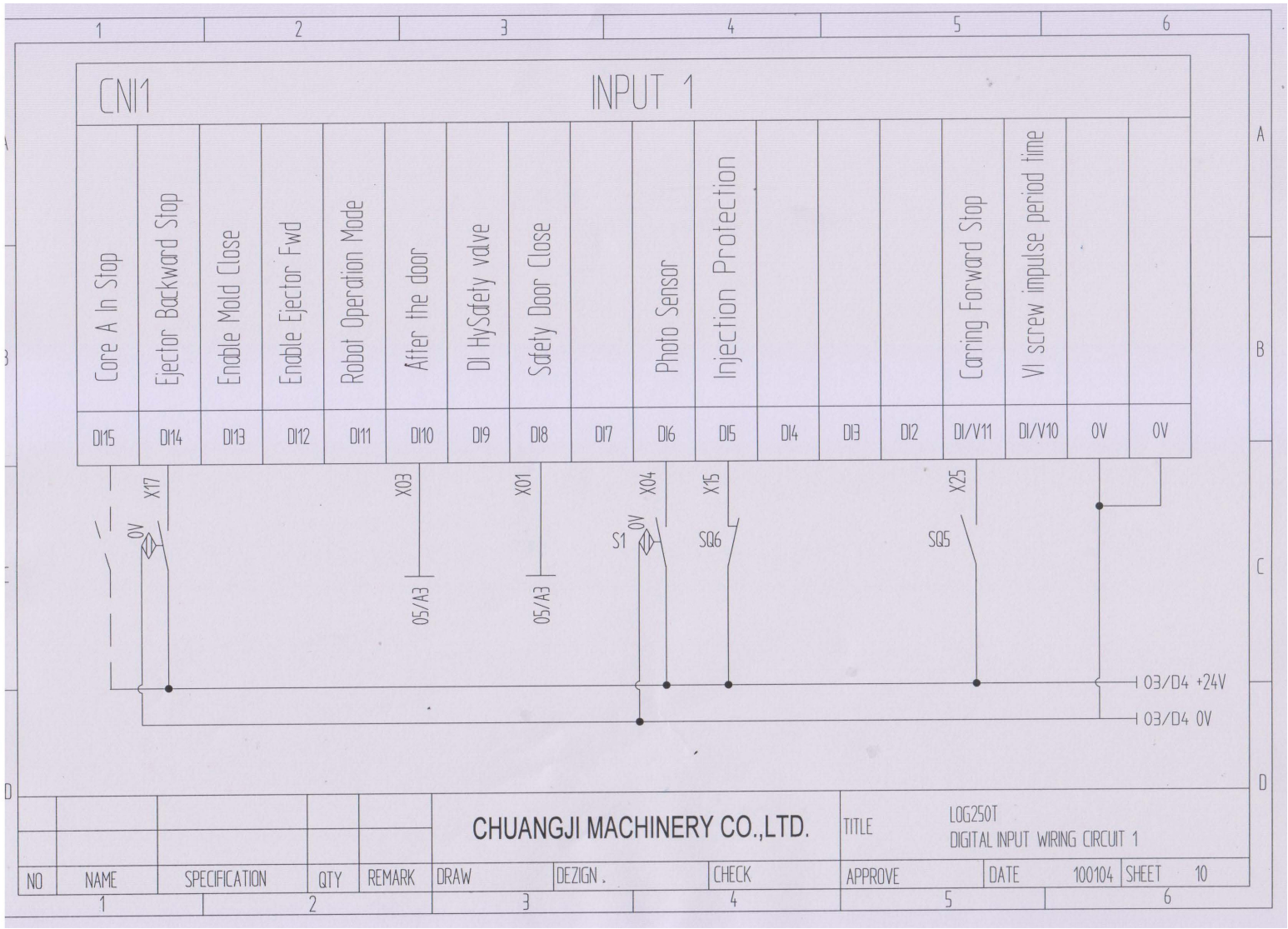
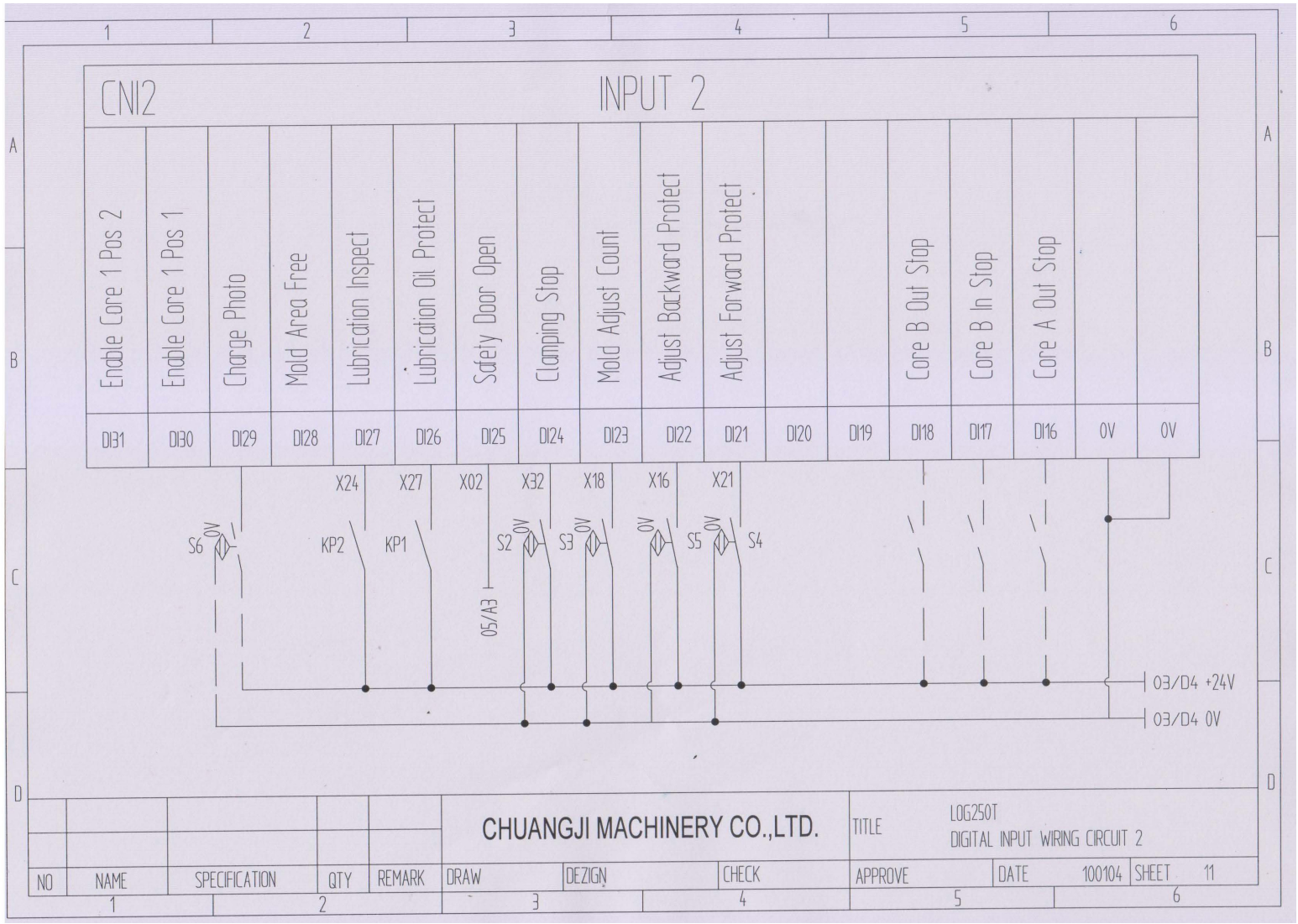

CN11
INPUT 1
Core A In Stop
Ejector Backward Stop
Enable Mold Close
Enable Ejector Fwd
Robot Operation Mode
After the door
DI HySafety valve
Safety Door Close
Photo Sensor
Injection Protection
Carring Forward Stop
VI screw impulse period time
DI15
DI14
DI13
DI12
DI11
DI10
DI9
DI8
DI7
DI6
DI5
DI4
DI3
DI2
DI/V11
DI/V10
0V
0V
X17
X03
X01
X04
X15
X25
0V
S1
0V
SQ6
SQ5
05/A3
05/A3
03/D4 +24V
03/D4 0V
CHUANGJI MACHINERY CO.,LTD.
TITLE
L0G250T
DIGITAL INPUT WIRING CIRCUIT 1
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN.
CHECK
APPROVE
DATE
100104
SHEET
10


CN12
INPUT 2
Enable Core 1 Pos 2
Enable Core 1 Pos 1
Charge Photo
Mold Area Free
Lubrication Inspect
Lubrication Oil Protect
Safety Door Open
Clamping Stop
Mold Adjust Count
Adjust Backward Protect
Adjust Forward Protect
Core B Out Stop
Core B In Stop
Core A Out Stop
DI31
DI30
DI29
DI28
DI27
DI26
DI25
DI24
DI23
DI22
DI21
DI20
DI19
DI18
DI17
DI16
0V
0V
X24
X27
X02
X32
X18
X16
X21
S6
KP2
KP1
S2
S3
S5
S4
05/A3
03/D4 +24V
03/D4 0V
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
DIGITAL INPUT WIRING CIRCUIT 2
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
100104
SHEET
11

CN13 INPUT 3

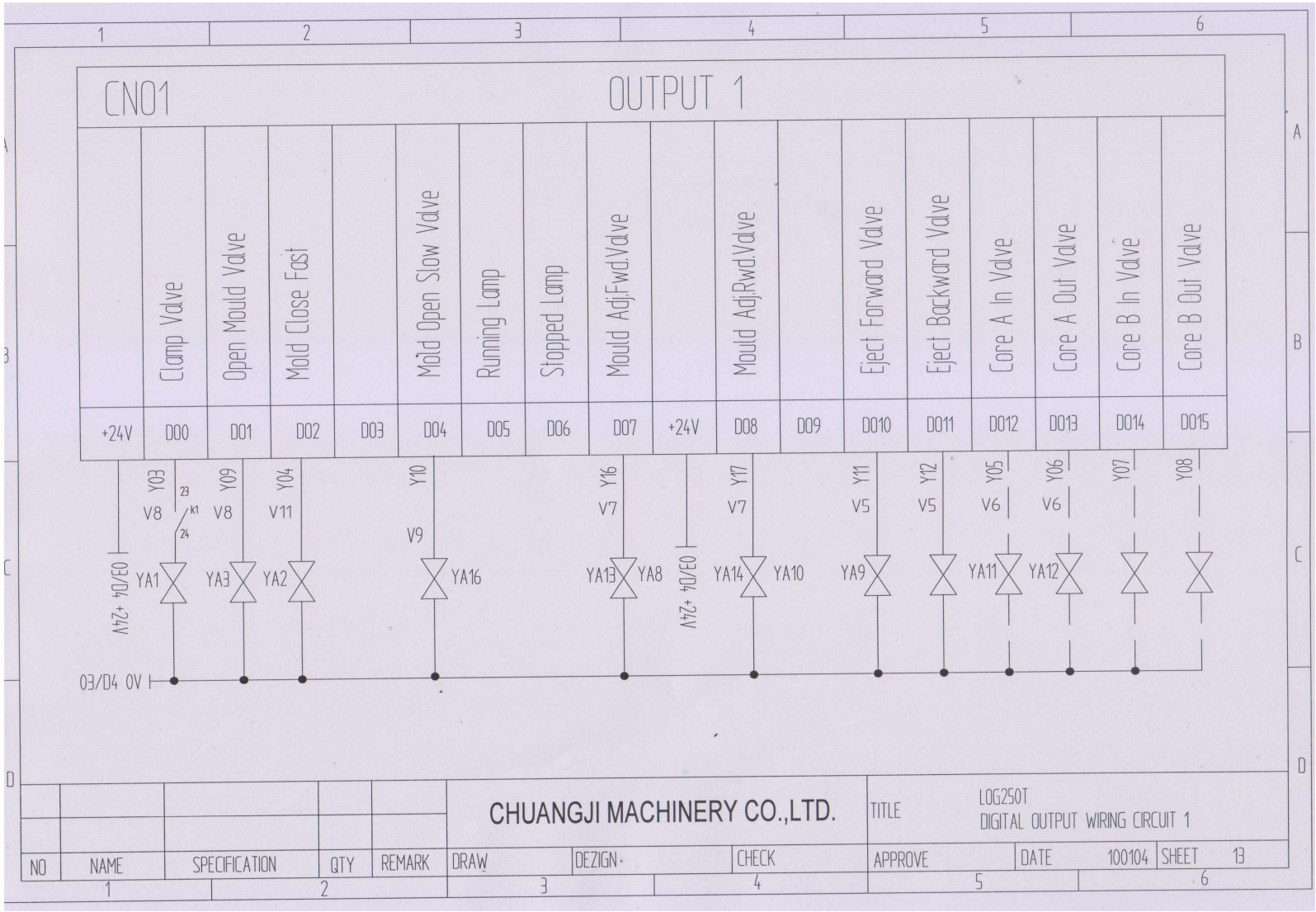
								DI39	DI38	DI37	DI36	DI35	DI34	DI33	DI32	0V	0V
									Core out 4	Core in 4	Core out 3	Core in 3		Robot Emergency Stop	ENable Full Mold Open		

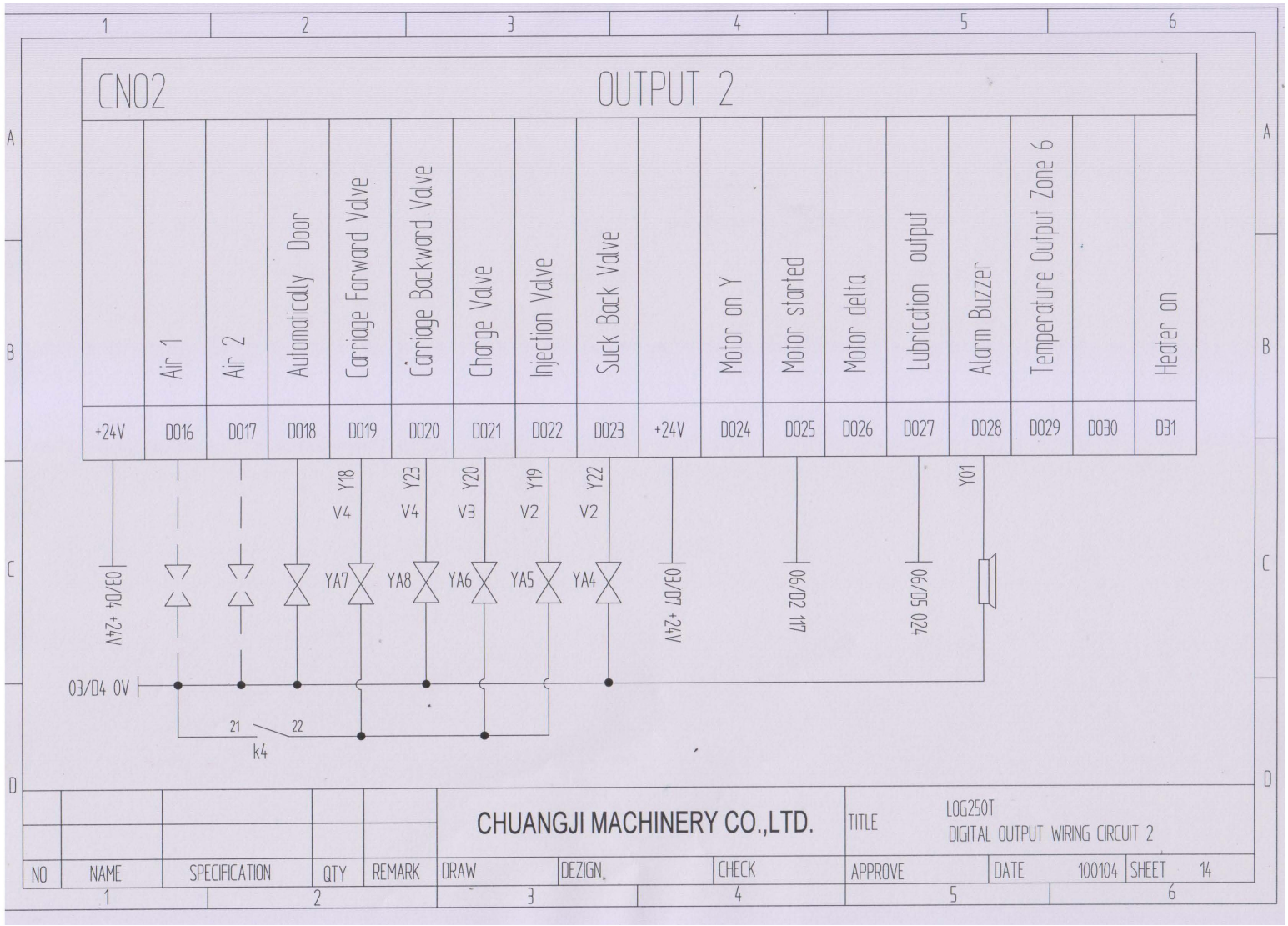
NO	NAME	SPECIFICATION	QTY	REMARK

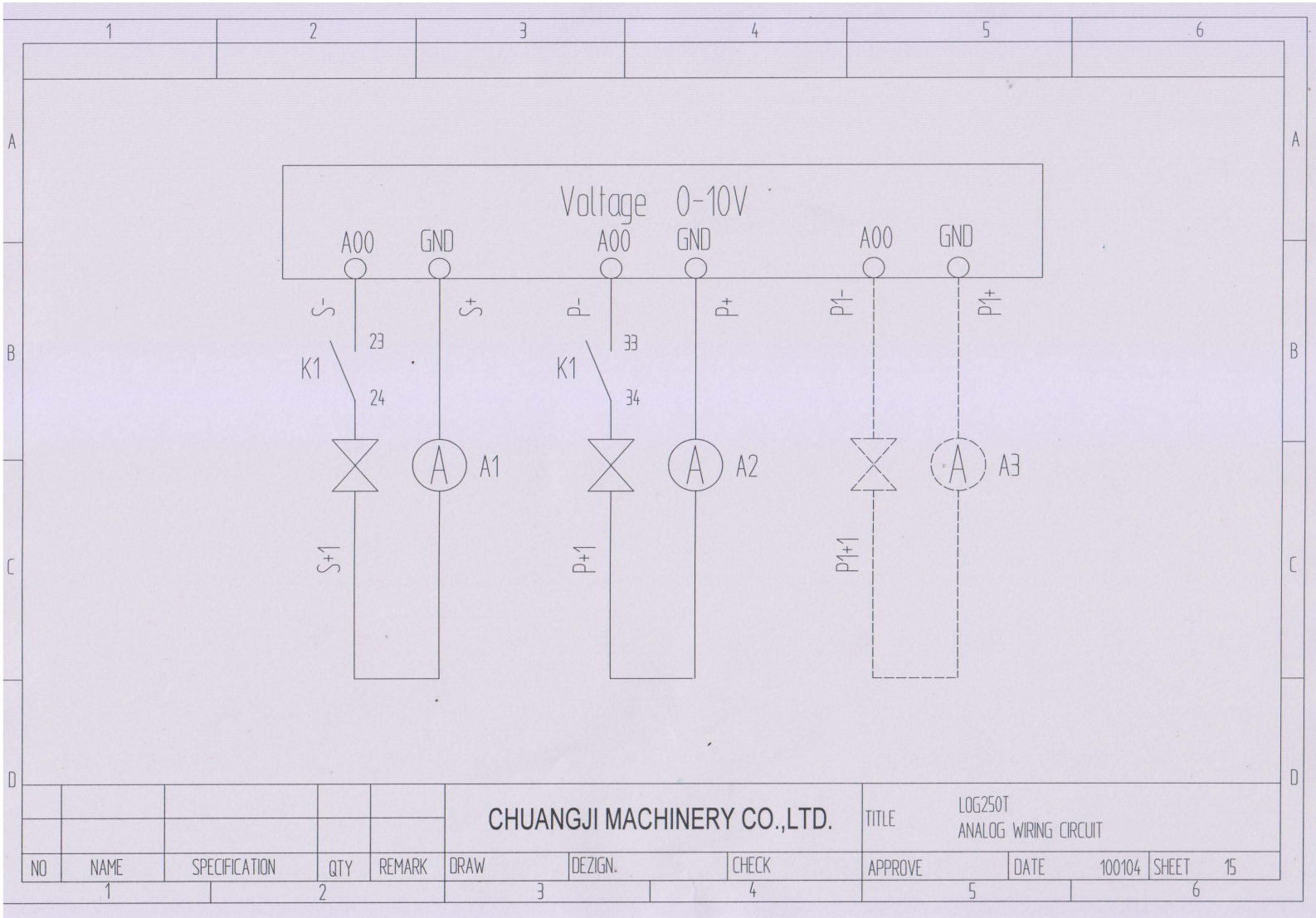
CHUANGJI MACHINERY CO.,LTD.

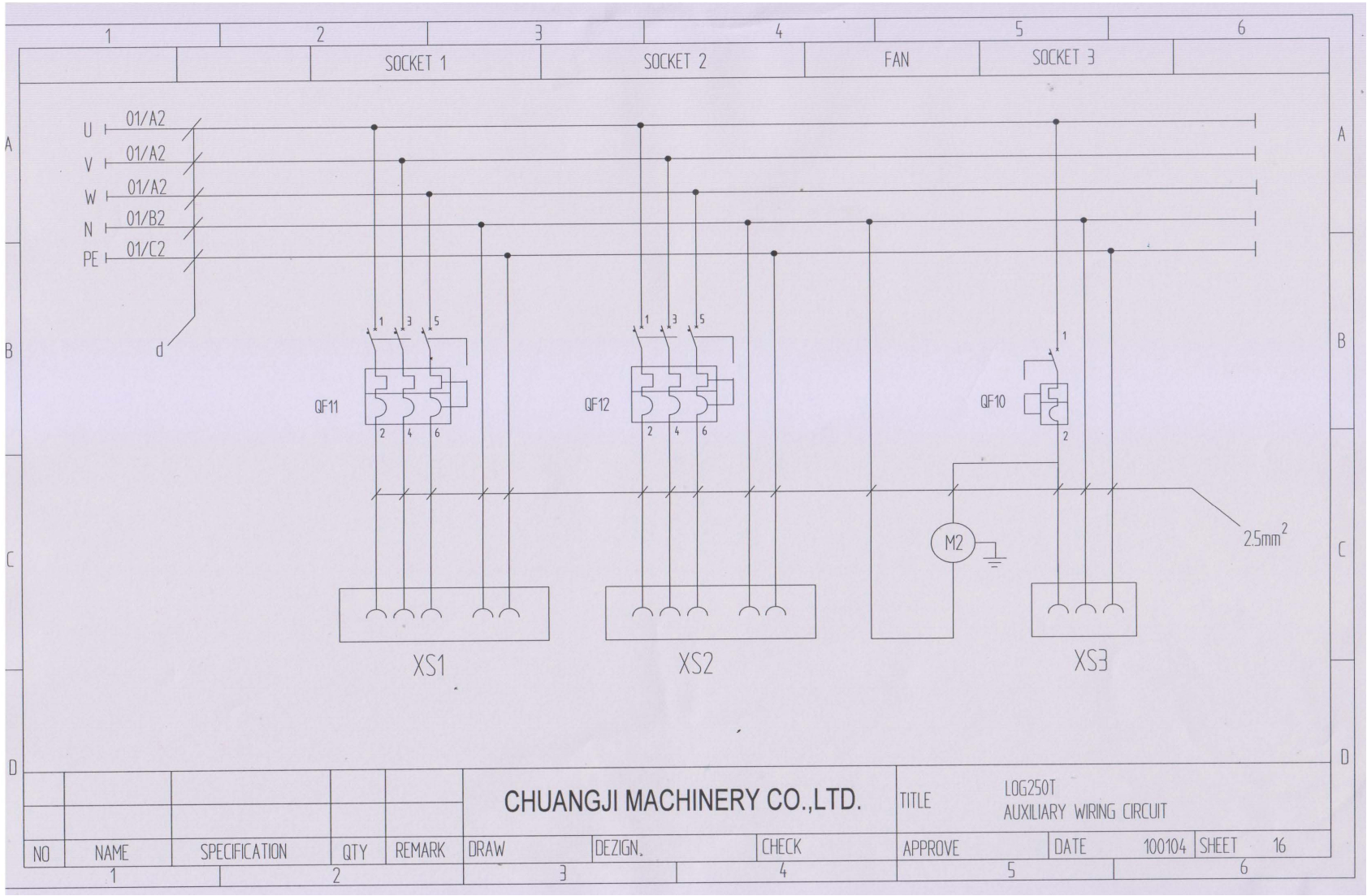
DRAW	DEZIGN	CHECK	APPROVE	DATE 100104	SHEET 12

TITLE LOG250T
DIGITAL INPUT WIRING CIRCUIT 3


CN01
OUTPUT 1
Clamp Valve
Open Mould Valve
Mold Close Fast
Mold Open Slow Valve
Running Lamp
Stopped Lamp
Mould Adj.Fwd.Valve
Mould Adj.Rwd.Valve
Eject Forward Valve
Eject Backward Valve
Core A In Valve
Core A Out Valve
Core B In Valve
Core B Out Valve
+24V
D00
D01
D02
D03
D04
D05
D06
D07
+24V
D08
D09
D010
D011
D012
D013
D014
D015
Y03
Y09
Y04
Y10
Y16
Y17
Y11
Y12
Y05
Y06
Y07
Y08
V8
V8
V11
V9
V7
V7
V5
V5
V6
V6
YA1
YA3
YA2
YA16
YA13
YA8
YA14
YA10
YA9
YA11
YA12
03/04 +24V
03/04 0V
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
DIGITAL OUTPUT WIRING CIRCUIT 1
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
100104
SHEET
13


CN02
OUTPUT 2
Air 1
Air 2
Automatically Door
Carriage Forward Valve
Carriage Backward Valve
Charge Valve
Injection Valve
Suck Back Valve
Motor on Y
Motor started
Motor delta
Lubrication output
Alarm Buzzer
Temperature Output Zone 6
Heater on
+24V
D016
D017
D018
D019
D020
D021
D022
D023
+24V
D024
D025
D026
D027
D028
D029
D030
D031
Y18
V4
Y23
V4
Y20
V3
Y19
V2
Y22
V2
Y01
YA7
YA8
YA6
YA5
YA4
03/04 +24V
03/07 +24V
06/02 117
06/05 024
03/04 0V
21
22
k4
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
DIGITAL OUTPUT WIRING CIRCUIT 2
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN
CHECK
APPROVE
DATE
100104
SHEET
14


Voltage 0-10V
A00
GND
A00
GND
A00
GND
S-
S+
P-
P+
P1-
P1+
23
24
33
34
K1
K1
A1
A2
A3
S+1
P+1
P1+1
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
ANALOG WIRING CIRCUIT
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN.
CHECK
APPROVE
DATE
100104
SHEET
15


SOCKET 1
SOCKET 2
FAN
SOCKET 3
U
V
W
N
PE
01/A2
01/A2
01/A2
01/B2
01/C2
d
QF11
QF12
QF10
M2
2.5mm²
XS1
XS2
XS3
CHUANGJI MACHINERY CO.,LTD.
TITLE
LOG250T
AUXILIARY WIRING CIRCUIT
NO
NAME
SPECIFICATION
QTY
REMARK
DRAW
DEZIGN.
CHECK
APPROVE
DATE
100104
SHEET
16

9.2 Hydraulic schematic diagram