EVERGREAT YOTA MACHINE CO, LTD

1. SPECIFICATIONS

1. Locking unit

Locking force	TON	650
Die platen size, H x V	mm	1280 x 1280
Clearance between tie-bar, H x V	mm	850 x 850
Die stroke, Max	mm	660
Die stroke, Min	mm	
Die height, Max	mm	900
Die height, Min	mm	350
Tie-bar diameter	mm	160

2. Shot unit

Shot force	TON	54.5
Intensification	Kg/c m^2	110~140
Shot plunger stroke	mm	630
Plunger tip penetration	mm	300 (above stationary die plate surface)
Shot position	mm	-250
Free shot speed, slow	m/s	0.1~0.5
Free shot speed, fast	m/s	1.0~7.0
Plunger tip diameter, standard	mm	80
Shot pressure (ϕ 70 tip)	MPa	99.3

3. Ejection unit

Ejection force	ton	31
Ejecting stroke	mm	0~125

4. Casting capacity

Following calculations are based on shot force 335 KN to 264 KN .100% molten filled up shot Plunger stroke 425 *0.75=320mm and aluminum specific gravity2.6. The figures for casting area do not include factors from off-center loads . metal impacts changes in metal viscosity. Intensifier effect and individual conditions of dies.

	Plunger tip diameter	Shot pressure	Casting area	Actual shot volume	Actual shot weight
	mm	Kg/cm2	c ㎡	cc	kg
1	70	707-1416	919-459	1788	4.64
2	80	541-1084	1201-599	2336	6.07
3	90	427-857	1522-775	2956	7.68

5. Dry cycling 12(s)

Die closing-die locking-shot-accumulator charging-die opening-shot Retracting-ejection forward-ejector retracting (including shifting time of valve)

6.Hydraulic

(1)Rated pressure	MPa	Shot Cylinder .Press.13.7 Intens. Press 21 Die closing 12 Ejection 12 Shot retracting 12
(2)Pump , pressure	MPa	14.7/21.0
Pump type		F11-SQP32-30-17
quantity		1(Double pump)
(3)Oil reservoir	L	600
(4)Oil tank capacity	L	600
(5)Accumulator type:		piston
Capacity	L	
Number	unit	1+1
(6)Oil cooler		
Water delivery	L/min	10
	Water temp	25℃

7. Hydraulic core pull unit

(1) solenoid valve for core	R	(1) 3/8” x 1 pc (2) 3/8” x 1 pc
(2) hydraulic take-out port for core	Rc.	(1) ¾” x 2 pairs (2) ¾” x 1 pairs
(3) plug socket for core	Quantity	(1) pair 1 (2) Pair 1

8. Lubrication for plunger tip

Shot sleeve and plunger tip lubricating pump. Delivery volume; 0~5.0(Oil type) Function(manual); Both lubrication and ail blow are operated by push button (Auto) ; Shot retract end→Air blow1→Tip lubrication→Air blow2(Die closing)

9 . Cooling water

(1)Connection to dies	R c	1”*1 Stationary die rear operation
(2)Connection out of die	R	2”*1 Stationary die rear operation
(3)Connection to oil cooler	R c	1”*1
(4)Rubber hose inner diameter For die cooling	inch	1/2”
(5)Quantity of water control valve	pc	3/8”*11 Stationary die side 3/8*15 Moving die side
(6)Cooing water required	L/min	80 Oil cooer (water temp. 25℃) 50~90 for Dies

10 . Electric

(1)	Motor capacity	37 Kw(30Hp) 6p AC415V for hydraulic pump 0.75kw 6p AC220V for die height 20w 2P AC220V for lubrication pump
(2)	Power source	AC415V (50HZ)
(3)	Capacity	40KVA
(4)	Operation panel (Size)	Fitted on Stationary die plate side (200W*170B*880H)
(5)	Control pane (Size)	(700W*380B*1500H)
(6)	Control	PLC/HMI

11 . Machine size

Machine size L*W*H (max)	mm	8800x2300x2780
Weight	ton	25

2. INSTALLATION

2-1 installation place

All around the die casting machine, sufficient space must be secured for maintenance, inspection and casting work.

Also, care must be paid for lighting. And space for melting/holding furnace, ingot and products-delivery-containers, and for various equipment for secondary operation as well as space for tie-bar removal (as per foundation plan) must also be provided.

Work place is to be kept air ventilated for reason the gas comes out of the furnace, etc. crane and/or chain block must be provided for the die installation.

2-2 Foundations

Location where machine to be installed must be sound and strong enough. Ground resistance desired to be more than 49kpa, and prepare concrete solid foundation in accordance with “foundation plan”. Ground, the resistance strength of which is below 49kpa, must be reinforced by piles and then covered by concrete.

Ground surface must be flat and even to have machine installed firmly. Spaces for piping for cooling water compressed air, gas, etc. and a reservoir of heavy oil. When using, shall be prepared beforehand. When the foundation completed, pitch, size and depth etc. of anchor bolt holes must be confirmed in accordance with the foundation plan.

1. Cooling water

Provide cooling water piping to inlets and outlets in accordance with instruction given in the foundation plan as to its location and size.

For the water discharge, special care to be paid to let the water go out smoothly.

According to seasonal condition, working condition and water temperature, quantity of the cooling water varies. For oil cooler, 40_1/min, for dies 30 to 70_1/min water must be considered.

SUPPLY	Rc 1 (1 inlet at the rear operation side)
	Rc1 (1 inlet at the rear operation side) (oil cooler)
DISCHARGE	Rc1 (1 outlet at the rear operation side) (oil cooler)
	Rc2 (1 outlet at the rear operation side) (discharge manifold)

2. Compressed air

For the purpose of die cleaning, spraying, extracting and tip lubrication, it is necessary to prepare the compressed air inlet with stop valve of about 1inch piping. The air pressure to be more than 0.5MPa.

Capacity required for fully automatic operation of die casting machine, automatic spray and extractor at cycle of 30s/shot : compressor 11kw, 0.7MPa, 2100NL/min. Air receiver (reciprocating-type compressor) 600L

-- Main piping to be fitted with 1/100 slant.
-- Branch to be fitted at upper portion of the main piping.
-- All piping must be of galvanized ones.
-- screw compressor not always necessitates the air receiver.

Compressed air is normally produced by compressing the air through air compressor. Accordingly the vapor and invisible dust in the air being accumulated in the air compressor in proportion to compression ratio will cause the compressor air gets dirty after all.

According to type of air compressor, oil-fed air compressor usually creates oxidation of lubricant and cause carbonic, tarred sludge owing to compression heat/friction heat, etc. Also, oil free compressor creates carbon grain.

To remove such impurities, it is necessary to install after-cooler, drain separator, main line filter, sub micron filter and air receiver etc. only with the filters fitted to the machine, it is not possible to make dirty air clean.

3. Gas

For pre-heating the dies it is recommendable to provide gas supply inlet with stop valve at bottom of the stationary die platen at the operator side. Such gas inlet is of course the absolute necessity for a burner. Prior consideration is the therefore recommended.

2-3 Unloading the Machine

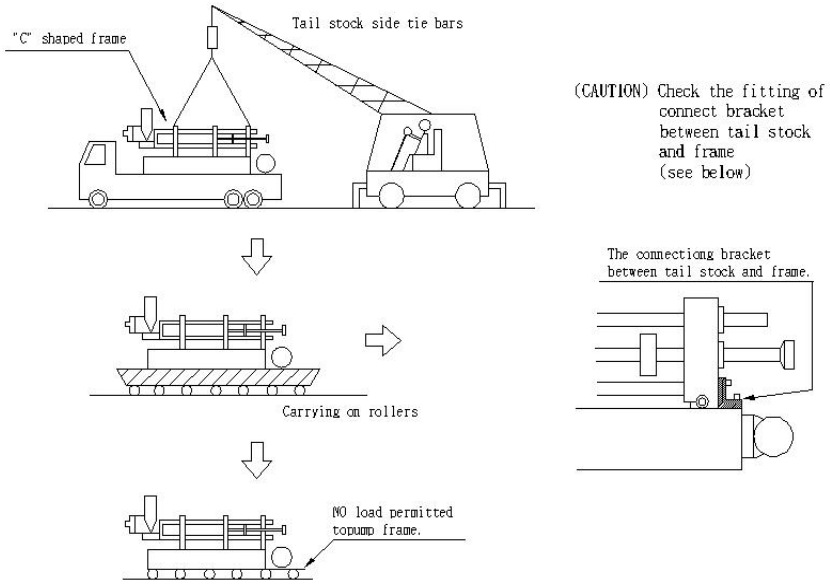
(1) Electrical control cabinet shipped being attached to the machine frame base with bracket.
When the machine is installed in place , remove the control cabinet from the machine frame
base and firmly fix it with anchor bolt : If the cabinet be left long as it is on the machine
frame base, then the cabinet might be damaged due to vibration of the machine.

(2) Unloading
Plenty waste cloth to be given to tie bars of " C " shaped frame and tail stock. And then
use wire rope.

(3) Cross the wire through the " C " shaped frame and the both ends of tie bar to be jacked up, letting the rollers be released. Thus the machine to be installed in
place on the floor.

(4) When unloading, care to be given so that no damage caused to all coverings and hydraulic piping, etc.

(5) When jacked up and wire lifting , if the machine is inclined lengthwise the special care
must be taken so that pump motor channel frame and hydraulic piping at the shot-end may not be suffered by the machine self-weight.

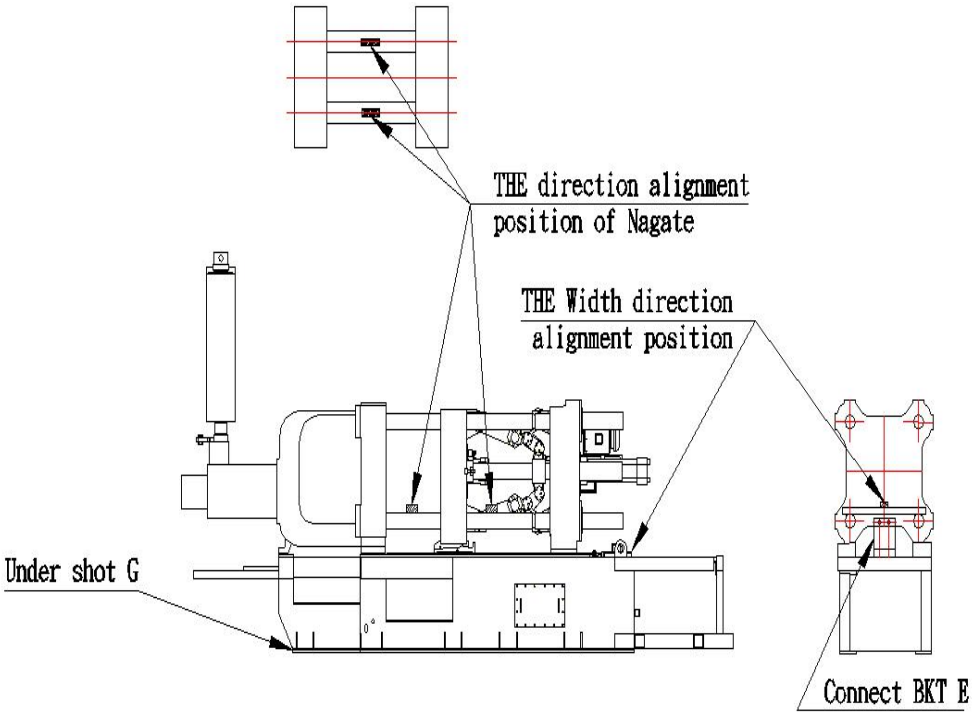


2-4 Installation

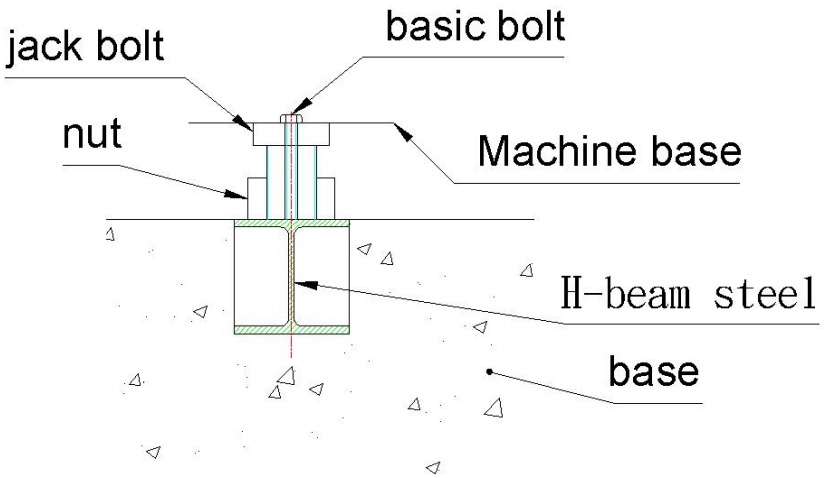
When machine placed on the foundation, level the machine lengthwise and breadth wise. Then fix the location of anchor bolts of the machine and control cabinet with concrete or mortar.
After solidification of the concrete or mortar, finally level the machine with base plate, etc.
If required, weld the base plate etc. to the machine . At last, fix the welded parts with concrete
or mortar.

Mixing ratio of concrete or mortar is as follows. (Rate by volume)
Concrete·····Cement : Sand : Pebble = 1 : 2 : 3
Mortar·····Cement : Sand = 1 : 2

1. The alignment of the direction of machine Nagate



2. Basic bolt type



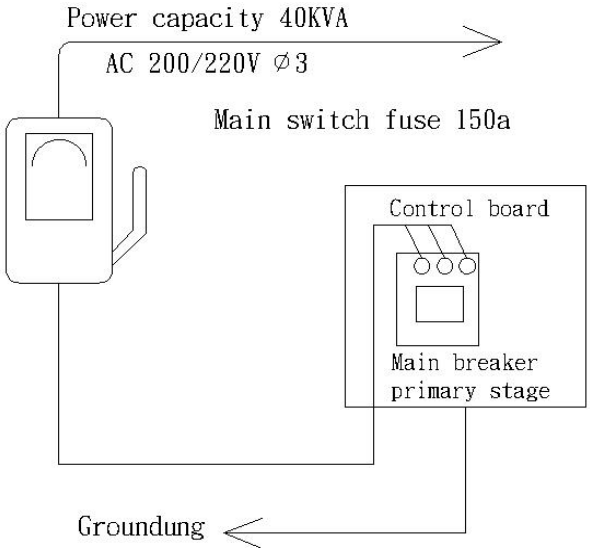
2-5 Connections to electric supplymain

When the installation completed, connect the cable of electric supply main breaker located in the control boad cabinet. Make ground connection to a grounding terminal in the control boad cabint. (third class ground connection work) The electric voltage allowance to be ±10% both for 50/60 Hz.

1. Source voltage
   AC220V/380V/415V/440V
   50/60Hz 3phase
   (Depend on the local power system)

2. Power capacity
   40KVA

3. Size of cable iV 60 mm²
   Grounding i V/ over 14 mm²

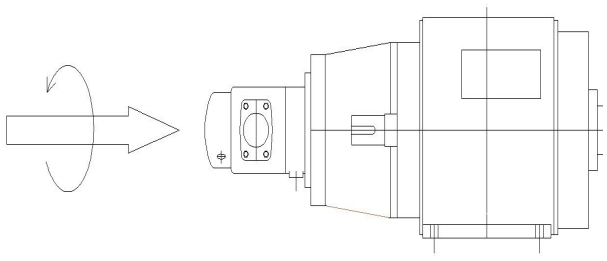


2-6 Cooling water

Please pipe a service pipe, a drainage box, and an oil air conditioner exhust port according to the pipe size of a water supply mouth and an exhaust port .

2-7 Confirmation method of moter rotating durection

Please check that coupling between a motor and a pump see from an anti-operation side, and is moving in the counter clockwise direction.
(Please make wiring of a motor reverse at the time of reverse rotation)



3. TRAIL-RUN AND OPERATION

3-1 Filling the oil reservoir

1. Pouring of operation oil (required quantity 600L)
   Use quality and clean hydraulic fluid to ensure long period operation of the machine. Fill the fluid up to the uppermost limit of oil level gauge fitted on the side of reservoir.
   As the oil level descends when the machine starts working, add the fluid to restore to the original fluid level. When re-fueling, care must be taken in order to avoid intrusion of foreign matters.

2. Indispensable conditions of fluid

1. The fluid is used not only for transmitting of pressure and motive power but also for lubricating the friction part, sealing effect by the viscosity, and anti-rusting role.
2. For selection of the fluid, show the following conditions to oil manufacturer for consultation.

(1) Viscosity
   Viscosity shows fluidity and varies according to temperature. The fluid used in this machine must be ISO viscosity grade VG68.
(2) Viscosity index
   Viscosity index shows the alteration rate of viscosity owing to variation of temperature. It is recommendable to use the fluid of index number 105 or over, however, it is not always necessary to adopt the index number 105 even sacrificing all other advantageous natures.
(3) Flowing point
   Flowing point means the lowest temperature with which the fluid can keep flowing. Flowing point is an important factor to consider when the machine used in the area of severe coldness. In any case, the fluid is requested to be of good quality that can start flowing smoothly even at the lowest temperature.
(4) Others
   In addition to the above, the fluid is requested to be ant emulsification, low counteractive rate (acidity) and high ant wearing features. For better utilization of additives, consult oil manufacturer.

3. Temperature of the fluid
   The temperature will greatly affect the nature of the fluid itself and life time of the fluid. Also, it will cause leakage and cavitations. Use the fluid at the following temperature.

	HIGHEST	LOWEST
OIL TEMP. IN TANK	55 C	15 C

NOTE
Please perform a heat rise, when operation oil temperature is 15 degrees C or less. It is 15 or less degrees, and when it is used, there is a possibility of damaging a pump.

4. Recommendable mineral hydraulic fluid

As long as the conditions stated above are satisfied, hydraulic fluids of any manufacturer may be used. We strongly recommend the high ant wearing hydraulic fluid(AW68). For details. Consult the manufacturers. The following brands are obtainable in the market.

HYDRAULIC FLUID CHART	
ESSO	UNIT POWER SQ68
SHOWA SHELL	TELLUS 68
MOBIL	MOBIL DTE
IDEMITU	DAPHNE SUPER HYDRO LW

5. Maintenance of fluid

(1) Supplementing

The fluid level is always to be between the upper line and the lower line of the level indicator. When supplementing, same kind and same brand of oil must be used. When the fluid becomes deteriorated, such old fluid accelerates deterioration of new fluid. Therefore, it is much economical to renew the entire quantity of deteriorated fluid instead of partial supplementing. When renewing the fluid, discharge the fluid in the accumulator by opening stop valve. And before filling a new fluid, operate the machine with flushing fluid.

(2) Renewing the fluid

When the fluid became deter iodated, it must all be renewed entirely, generally once every two years. It is recommendable to have fluid manufacturer analyze the used fluid to check the change of property of the fluid once a year.

(3) Inspection of fluid

Once a year, send used fluid to the manufacture for analysis.

Standard of renewing the fluid

Change of viscosity : more than +-10% (as getting old, viscosity index becomes larger).

Total acidification : more than 1.0mg KOH/g. (sticky materials will be mixed in the fluid)

Moisture : more than 0.2VOL% (turbidity takes place.)

Sedimentation : more than 0.1ML/10ML

(4) Cleaning the fluid

Once a year, it is recommendable to clean the hydraulic fluid by the manufacturer in order to lengthen service life of the fluid, to minimize trouble of hydraulic equipments and the wearing. The cleaning can be done even while the machine is in operation.

6. Flushing

PURPOSE	Whenever fluid be renewed, it is necessary to be flushed. Flushing is effective to remove sludge materials of fluid stacked to the hydraulic components, rusts, non-oily materials and also to remove the sediments at bottom of the reservoir. If the fluid sludge materials remain, life time of new fluid will be shortened. Consult with the fluid manufacturer.
METHOD	Completely discharge old fluid and clean all inside of the reservoir with sponge. Viscosity of the flushing fluid must be almost same as that of hydraulic fluid and can be mixed with new fluid. Flush for approx. 24 hours as machine is kept running. When the flushing is over, discharge the flushing fluid, wipe off remaining fluid in the reservoir with sponge, and then fill new fluid.

7. Fire-safe fluid

The general mineral fluid is flammable. Therefore, fire-safe fluid is recommendable to use. On the other hand, however, the fire-safe fluid costs higher than general mineral fluid and requires higher maintenance, although it is not inflammable and free from personnel injury due to fire. Although the fire-safe fluid has been improved, in view to life time of the hydraulic equipments, it is still inferior to the mineral fluid. In case of using fire-safe fluid, kindly contact us beforehand.

(1) Type

①. Ater-glycol hydraulic fluid

②. Ater-in-oil type emissive oil (W/0 type emulsion)

③. Organic compound fluid

(2) Precaution when using the fire-safe fluid

①. When the water content is evaporated, the anti-fire features will be lost and the viscosity is increased, causing malfunction of hydraulic equipments. To avoid such happening, the customer is kindly requested to keep in touch with oil manufacturer for adequate maintenance of the fluid.

②. When changing the fire-safe fluid to mineral fluid or vice versa, flushing treatment must well be carried out.

③. Keep close contact with oil manufacturer for pertinent maintenance and efficient services.

(3) Filling of fire-safe fluid

In case of shipment of machine, the trial of witch was conducted in our factory using the mineral fluid, we will effect actual shipment after having carried out a flushing operation with fire-safe fluid and a complete tank cleaning. Therefore, after the Plunger installation of machine, we recommend that the user will execute another flushing and tank cleaning and then fresh fluid is to be filled up

8. Plunger tip lubrication

To avoid seizure of plunger tip, the plunger tip lubricant is automatically and compulsorily supplied via the lubricating pump of our own designs. Both water-soluble and oily lubricants can be for the device the device has the air blowing function.

specification

Air pressure	0.4MPa or over	
delivery	Oil type	0-5cc (0.005L) (adjustable, 1 scale = 1cc (0.001L)
Action	Manual auto	Lubricating and air blowing are independently operated by pushbutton switches.
Operation	If air blow 2 not necessary, “air 2” timer on timer. Counter screen is set at “0” sec.	
Timer setting	Air blowing 2 is turned off when passing the high-pressure die closing position, so the timer setting must be done to match the cycle.	

9. Plunger tip lubricant chart : the following lubricants are available in the market. Consult lubricant manufacturer to choose the best grade.

	manufacturer	TYPE	GRAPHITE
oil	Hanano shoji	Gra face no. 385	contained
		PL-3S	Not contained
	Nichibei	Plunger ace no. 66	contained
		No. 51	Not contained
	Matsumura oil	Neo caster B-200	contained
Water-soluble	Hanano shoji	Gra face P-1200	Not contained
	Nichibei	Plunger ace no. 24	Not contained
	Matsumura oil	Neo caster PW-10	Not contained
		Neo caster PW-20	contained

10. Lubricating oil

(1) Oil

The strong oil film is absolutely necessary for the lubrication of the toggle structure. In this point, the general oil is not proper for use of toggle system. The user is trendily requested to use the high class lubrication oil that contains the extreme-pressure additive in the market.

Specification of toggle lubrication pimp

Motor: AC220V 20W 2P E class
Tank capacity : 3L
Delivery pressure : 19.6MPa
Delivery amount : 50HZ 150cc/min
60HZ 180cc/min

(2) Grease

Use the grease (viscosity 00)

If the other grease than the one of viscosity 1 is used “mal distribution” and/or “grease drooling” may be caused and the lubricating capability is possible to drop. Also no grease other than viscosity 00 must not be used in the automatic grease lubrication device.

11. Instruction manual of lubrication pump

(1) when electrical power is supplied to the motor. At first the discharge (DIS) timer operates with a green lamp lighten for the set discharge time, and after the certain period set previously is done, then the interval timer operates with a yellow lamp lighten for the interval time set previously/thus, both of the timers automatically operate by turns.
(2) The pump reservoir reaches the lower limitation level, a red (EMG) lamp is light on, then the pump is automatically stopped. The reservoir must be refilled, and then a re-set button should to start over.
(3) In case the pressure remained in main line after pump discharged is below 1.7MPa, the re-set button for starting over.
(4) The force out button can make the pump discharge at any option.

3-2 operation

1. Pump operation

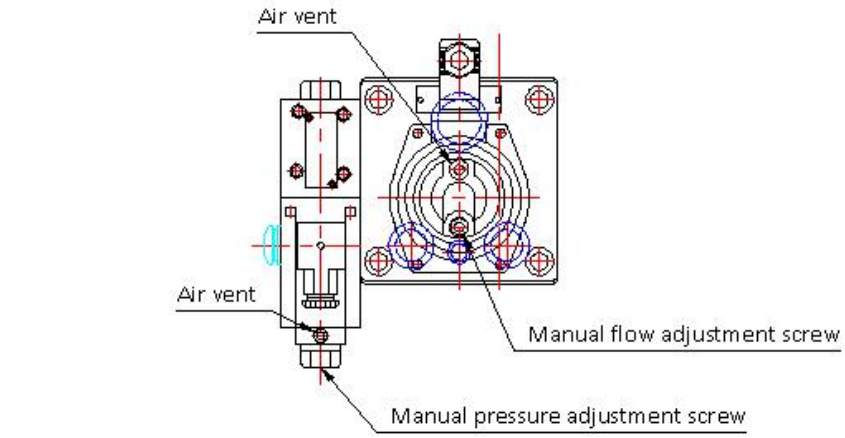
The pump operation is to be done as follow. (see “hydraulic circuit diagram”)

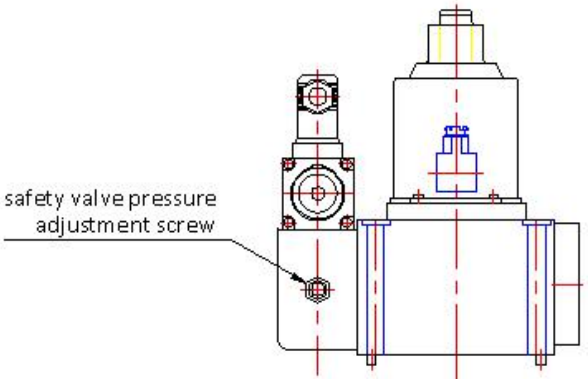
(1) open the gauge cocks and confirm if the needle of pressure gauges (noted below) points at 0MPa
(2) Turn on the power source
(3) Set all change-over switches on operation panel at “0” (neutral). Turn on the key switch of “operation power source” and press the push button switch of “pump start”. In this case. Touch two switches (one is the push button switch of emergency stop and the other the push button switch of pump start) alternatively, two or three times, with an interval of one second each for the purpose of inching operation of pump. This, you can confirm the rotating direction of pump.
(4) Repeat “stop” and “start” of pump with an interval of one second to see if no oil leakage talking plate. After this, in the on-load condition, operate the pump continuously for about 5 minutes.
(5) Change-over the operation switch to “manual” mode, and confirm that ACC. charge goes as high as the preset pressure value on INJECTION SCREEN.

2. Pressure adjustment-Safety valve pressure setup of the pressure match valve

(1) Adjustment screw are to be tightened up.
(2) The P/Q valve with a safety pressure adjust valve. the safety valve is set the machine max. pressure. But it could not used for control machine motion pressure.
(3) Under on-load condition, the air is to be exhausted through air vent. (The ail vent bolt is loosened and. When the air bubble stops to come out, the bolt to be tightened).
(4) When the air exhausted, confirmation if the pressure of 14 MPa is being maintain under on-load condition (accumulator charging)
(5) When air exhaust is completed. The manual flow adjustment screw and the manual pressure adjustment screw are to be restored to the original status.
(6) With all of the above, the rate pressure adjustment completes
(7) All the machine motion speed and pressure parameter is set thru the HMI panel. And control by the P/Q valve.

To have a stable control, be sure to carry out an air exhaustion through the air vent in all cases





3-3 Accumulator nitrogen filling-up and refilling

Nitrogen gas has charged into the accumulator in the factory. Please check & charge nitrogen gas into the accumulator by the proper pressure before use. Nitrogen pressure should be 85bar min. or 70~85% of hydraulic pressure.

Example: Accumulator set pressure is 110bar. The N2 pre-charge 70~85% of the 110bar was 77~93.5bar.

3-4 Normal operation

1. When starting

	OPERATION	CONFIRMATION ITEMS
1	Inspection & cleaning of die, tip and sleeve.	Any galling, damage to pin, lubrication of slat pin, guide pin & core sliding face.
2	Preheat cavity face of die.	Heat up to 150 (face temperature)
3	Open stop valve of air supply.	If reducing valve pressure gauge is 4~6bar or over, air leakage is suspicious.
4	Open stop valve of cooling water supply.	Water flow of oil cooler, tip and die. Any leakage.
5	Confirm if lube oil quantity is enough.	Refuel if necessary. (read oil level scale).
6	Turn on power source switch.	
7	All change over switches on operation panel to be set at “0” (Natural position)	
8	Operation power switch on operation panel to be set at “ON” and press down hydraulic pump starting button.	Confirm if any abnormal noise comes out of pump. If noise comes out, make a pump start by inching operation of start button.
9	Push down “Emergency stop” button.	Confirm if hydraulic pump can be stopped at two places, operation side and opposite side of tail stock.
10	Make pump starts again in same order of above item (8).	Same as item (8).
11	Inspect every part of machinery.	As per 4-3 (Daily inspection)
12	Temperature of melting furnace, flux treatment and removal any oxidized material.	Temperature to be kept at 650 to 680 (Variable according to material and die).
13	Confirm charge pressure of accumulator. If changed-over to only “MANUAL”, then accumulator is charged up.	By ACC1. pressure gauge: 110~140bar (shot accumulator) ByACC2 pressure gauge : 150~210bar (intensify accumulator)
14	First select the pressure and speed of “mold clamping”, “ejection” and “core”. Confirm the injection speed and intensify adjustment, and then go into the casting operation.	The die clamping cylinder is provided with a cushion at the die opening end. Due to the effect of the cushion, if die opening is stopped near the stroke end, the die may not be opened further even if opening operation is made. If this problem occurred, close the die once, and then make opening operation again.

2. Finish operation

	OPERATION	CONFIRMATION ITEMS
1	“ON-FF” key switch to be set at “OFF”	Key switch on operation panel.
2	Turn off the power source breaker.	
3	Turn off the primary side power source of user’s factory.	Confirm that the lamp of “power source” (power unit boad front) is lit off.
4	Stop valve of air supply and water supply to be closed.	Air and cooling water supply are stopped.
5	Gas valve or heavy oil valve of furnace to be closed.	Confirm remaining quantity of melted metal, and make preparation for next day’s job.
6	Inspection and adjustment of dies.	Die cleaning and repair, especially, confirm if any galling exists on stationary side inner sleeve.
7	Inspection and cleaning of every part of machinery.	Oil leakage of hydraulic line, and damage of lubricating parts. Any galling on moving die platen sliding part quenched steel.

4. MAINTENANCE & INSPECTION

4-1 importance of maintenance & inspection

Die casting machine is generally used under such condition that a great deal of metal fractions and various sorts of dust etc are dispersing in the air and the machine is forced to function for long hours in such hard surroundings.
Our machine is specially designed to well stand such handicaps. However, if no attention is paid for good maintenance and the machine is left unattended under severe working condition without proper maintenance, it is possible that the machine becomes unable to demonstrate originally designed superiority owing to many causes. The "CHECK LIST' described hereunder is prepared with our desire that the customers will undertake a pertinent maintenance and inspection to keep our machine in the best condition whereby the customers will be able to promote quality control for the finished products and to achieve higher productivity. Regular inspection and treatment are the prerequisites to have a machine work in its best condition all the times. It is desired that the work forces in the factory are trained to become well acquainted with every details of the "CHECK LIST" so that they can enhance their efficiency in producing better quality of goods.

NOTE

(1) protection of die fitting surface.
Once a week, remove the die and clean its fitting surface. These days, the release agent used in die cast spraying work become water soluble and effective for die cooling etc. however, according to its kind, some one contains such features that aggravates metal corrosion. If such agent of "aggregative nature" is used the corrosive-wear develops, whereby, the die-fitting surface may be damaged. For prevention of metal corrosion, the rust-proofing lubricant or grease are used on the die fitting surface after a thoroughgoing cleaning the fitting surface.

(2) "grease-up" in the area of tie bar nut of stationary tie bar. The grease nipple is provided at the tie bar nut portion (total 4 places), by which the greasing-up must be carried out once in 6 months. (the grease to be filled till the grease comes out of the tie bar space)

4-2 Check items list

1.Daily checkup items.

(1)Pump stops of emergency stop button pushed? Safety door move well?

(2)Fluid oil not Dirty or decreased? Cooling water is running normally?

(3)Air pressure is normal?(0.4MPa)

(4)ACC charge pressure rises normal?(High speed. 120MPa, intensify 21MPa)

(5)Tip lubricant outlet & tip center agree each other? No clogging?

(6)No galling on sleeve & tip?

(7)Switch & LAMP work normally? No damage?

(8)NO adhesion of aluminum or dust on ladler's electrode bar or block?

(9)Ladle is well covered by coating agent? Is it well maintained ladle?

(10)No loosening of LS for safety hook, extract confirmation limit switch & spray top limit?

(12)When die locked interlock of no entrance of extractor or /and spray work well?

(13)Air auto drain works normally?

(14)No oil leak out of cylinder, valve, pipe & ladler reduction gear?

(15)No abnormal sound out of pump motor & ladler motor?

(16)No vibrating, abnormal sound from cylinder, toggle, pointer, gear?

(17)When work is over clean each part.

2. 1 month , 3 months checkup screen.

(1)control panel fan moving? Cleaning of fan filter?

(2)'0'point of electrical flow control in right position

(3)Ladler gear case oil level (2 place) is up to center of oil gauge?

(4)No damage on wire of ladler bar? Work stops if middle bar earthed?

(5)No shock when arm &spray turn? If any, adjust shock absorber.

(6)Cleaning of air filter inside.

(7)Spray cylinder. Not descend from top. Even of air pressure decreased to zero?

(8)No scratch on tie bar & guide bar? If any, search cause of scratch

(9)No damage on pipes, hoses, wirings?

(10)No leak of air, liquid? If needed, tighten up or change seal.

(11)Actual pressure of die open/close & eject meets actual value on HMI?

3. 6 month, yearly checkup

(1)Relay timer firmly set? wire not loosened? If much arcing change it.

(2)Replace oil cleaner , air filter. Cleaning of suction filter.

(3)ACC nitrogen pressure normal? (ACC1.80kg/cm2,ACC2 110kg/cm2)

(4)How is tension of ladler chain?

(5)Adjust moving platen slide plate height.

(6)Sampling of fluid oil for maker's check.

(7)Bolts, nut & couplings not loosened? No clattering?

4. 2years, 4years checkup

(1)Change fluid oil. Flushing of oil tank.

(2)Change hydraulic hose. (all hoses)

(3)All air hoses to be change.

(4)Detection bar block of ladler to be changed.

(5)Ladler arm bearings & ladle axis bushes to be changed.

(6)Ladler small arm chain to be changed.

(7)Ladler gear oil to be changed.

4-3 Inspection of pump abnormality

Following table shows the various troubles and counter measures that often time take place. Be aware that the pressure and the delivery have co-relation each other. When repairing, use correct tools and employ proper pressure measuring device.

TROUBLE	CAUSE	COUNTER-MEASURES
PUMP DOES NOT GIVE PRESSURE	Rotating direction of axis is adverse.	Correct rotating direction right away to prevent galling or breakage to lack of oil film.
	Tank oil level too low.	Refuel the oil. Confirm if suction pipe is under the oil level.
	Oil suction pope or suction filter is clogged.	Clean the clogged parts.
	Air leakage from suction circuit.	Pump that no leakage occurs. Otherwise noise comes out or operation circuit becomes out-of order.
	Pump rotation is too slow.	Check the minimum number of rotation.(Ref. catalog)
	Oil viscosity too high.	Use the oil of low viscosity far as practicable according to temperature and usage.
	Damage of pump axis or rotor.	Part to be renewed.
	No delivery of oil due to any one of the causes mentioned above.	Inspect inside the tank. Check oil circulation. Remove the plug of pressure circuit near-by pump to find abnormality inside.
	Relief valve and unloading valve do not function to adjust pressure rising.	Stop machine and oil circulation. And check by pressure gauge.
	Needle valve and sheet of relief valve is in good contact.	Overhaul or renew the parts.

TROUBLE	CAUSE	COUNTER-MEASURES
PUMP MAKES NOISE	Oil leakage of cylinder valve in hydraulic control circuit.	Block each circuit and check each leaking point.
	Oil goes into the tank line through hydraulic circuit.	Check if valve is in open-center condition at neutral position. Check if other return circuits are open.
	Vane is stuck into rotor slot.	Check around the vane edge or check the oil that is stuck.
	Head cover is loosened.(Rare case)	Head cover should not be fastened too much. Adjust it at rated torque.
	Suction pipe circuit, filter, suction open/close valve etc are clogged.	Clean clogged portions to avoid cavitations.
	Air leakage of suction pipe connection or flange.	As listening to noise, furnish to flange portion. After this, tighten-up pipe connection or flange, if necessary.
	Air leakage of pump axis packing.	
	Vane stuck.	Check edge tip or oil stuck around.
	Vibration of unloading relief valve.	Check the air penetration in way of pump suction side or pump axis seal.
	Pump head gets loosened or gasket is damaged.	Supply oil to head for checking or gasket to be renewed.
	Air bubble in suction oil.	Check if return pipe circuit is below oil level.
	Air breather of oil tank is clogged.	Check if air breather is open for air.
	Number of pump rotation is too much.	The number of rotation must not exceed catalog indication.
	Oil viscosity too high.	Use the oil of designated viscosity.
	Suction filter too small.	Clean suction filter. After this, if the capacity found inadequate then increase the capacity.

4-4 Cleaning of oil/air conditioner

Please perform clean of an oil conditioner once in half year. If an oil/air conditioner is got blocked. Operation oil stops fully getting cold. With cooling piping. Please remove the bonnet by the side of opposite, and clean the part of copper. Please clean with a soft brush etc. ,not to damage a copper pipe.

4-5 Suction filter maintenance

1. If the suction filter is clogged the resistance forth increases and an abnormal Noise may come out of the suction pump.
   Clean the filter every 6 months.
2. Remove the bolt . Take out the suction filter and pipe coupling piece.
3. Wash the filter with kerosene (mineral oil) or water (water glycol) and dry up the filter by using air gun.
4. After cleaning the suction filter, start the suction pump by inching operation.

DIE CASTING MACHINE MAINTENANCE CHECK SHEET

DAILY CHECK

ASSORTMENT	DATE NO	M/C NO	MACHINE TYPE
MAKER	Mfg.NO	DATE Mfgd.	DATE OF PURCHASE
			MACHINE TYPE

DATE				/	/	/	/	/	REMARK
NAME OF CHECKER									
SAFETY DEVICE	Emergency stop switch		Operation side.Operation Box						
			Rear operation side tail center portion						
	safety device		Vavle functionability						
			Functionability of safety hook						
			Limit switches						
CHECK ITEM	Oil	Oil fluid	Oil quantity						
			Turgidity colour tone						
			Oil temperature						
		Hydraulic unit	Pump						
	Abnormality		Pressure gauge(zero position)						
			Itensifing charge pressure						
			Shot charge pressure						
		Die clamping unit	Die clamp cylinder						
	Vibration		Toggle						
			Die plate slide face						
			Solenoid valve						
		Shot unit	Shot cylinder						
			Point arm						
			Sleeve.tip						
			Tip lubrication						
	Oil leak		Cooling water						
	Electric part		Switch.lamp						

INSTRUCTION ADJ.MARK			INSPECTION MARK
V:NO abnormality after check (Adjustment incomplete)			
A:Check	D:Oil feed	G:Adjustment	X:Good
B:Overhaul	E:Refill	H:Modify	Y:Unstable but no effect to work
C:Cleaning	F:Tighten-up	I:Replacement	Z:Extensive adjustment necessary

安全裝置使用說明 Safety devices

安全門開關與各部件機能互鎖說明

Safety gate limit switch and interlock the various function

操作側安全門為主要控制安全作業的部件,機器各部動作與安全門開啟的互鎖於下表中說明.在全自動運轉模式中,當突然打開安全門時,機器的動作會突然中斷.請重新回原點再操作起動.

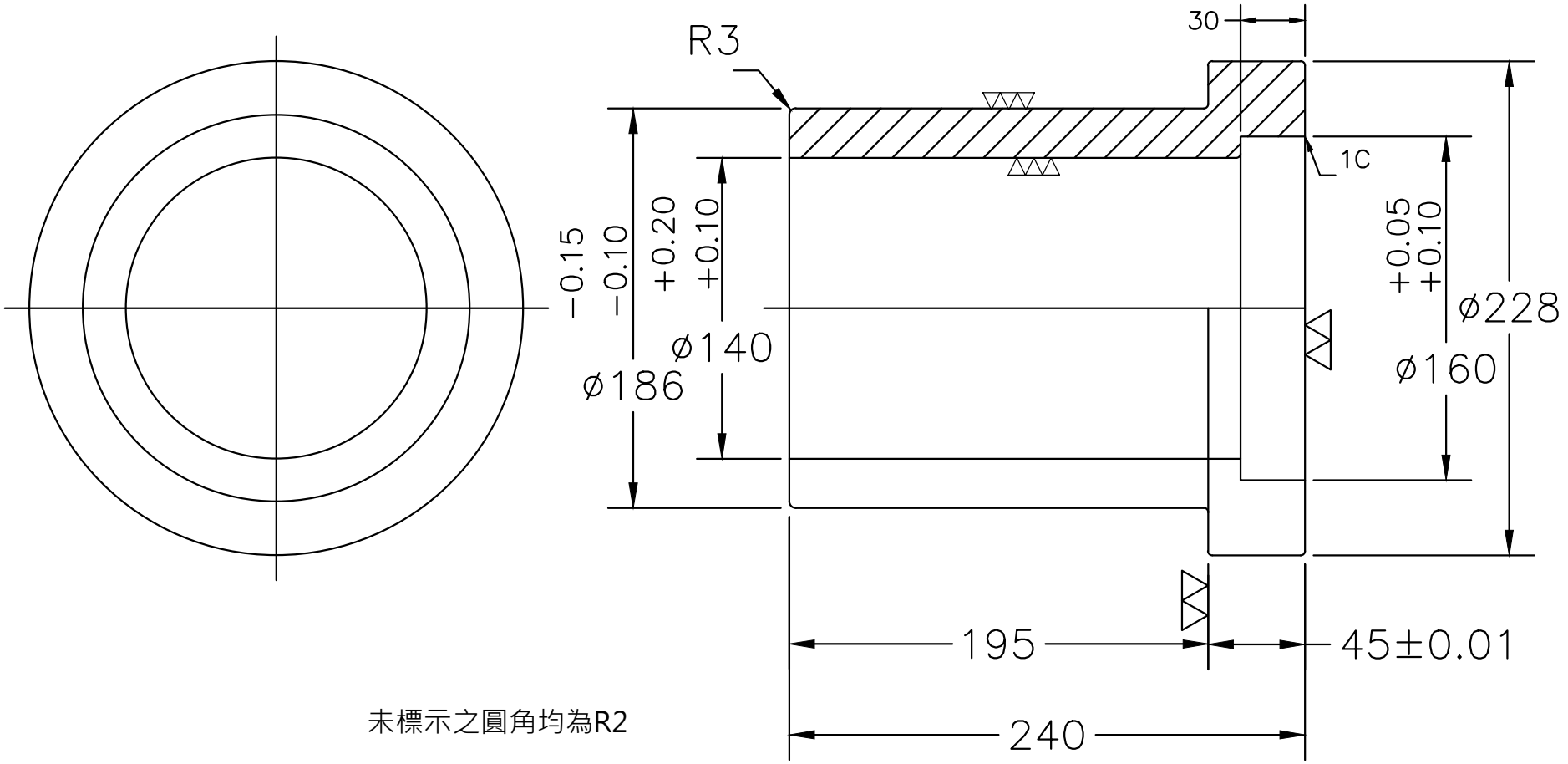
Operation side safety door as the main control of the safe operation , machine movement and security door open interlock in the table below . In auto operation mode, when suddenly open the security gate, the machine action will suddenly interrupted. Please re-homing operation starts again.

模式 Mode		項目 Project	動作/再啟動方式 Action / restart
手動 Manual	1	型閉 Die Closed	動作禁止,安全門關閉後.兩手按押曲手啟動按鈕才開關模 Action against, security door closed. Both hands push on the start button for die close.
	2	型開 Die OPENED	動作禁止,安全門關閉後,開關模操作開關在中立位置後,才可再操作開模动作. Action against, security doors closed, operation switch in the neutral position, can then operate die open.
	3	押出前進/後退 Eject forward / backward	動作可 Action can be
	4	中子抽插 Core in/Out	動作可 Action can be
	5	射出前進 Injection advance	動作禁止,安全門關閉後,射出的操作開關在中立位置後,再操作射進才會動作 Action against, safety door closed, and put down ladle safety gate ,injection fwd. switch in a neutral position , re-operate injection switch then inject forward will be action

	6	射出後 Injection Retract	動作可 Action can be
	7	取出機模內前進 Extractor move forward in die	動作禁止,安全門關閉後,再操作取出機前進開關才會動作 Action against, security door closed, then switching operation will moves forward
	8	取出機/其他動作 Extractor/ other actions	動作可 Action can be
	9	噴霧機上下 Auto Spray move up and down	動作禁止,安全門關閉後,上下操作關閉在中立位置,再操作才會動作 Action against, security doors closed, the upper and lower operating located in the neutral position, and then operations will move
	10	噴霧機噴霧吹氣 Auto Spray die coat spray and air blowing	動作禁止,噴霧機在下限位置的情況,安全門閉上才會動作 Action against. The auto spray in the lower position, safety door closed, and then avaible.
	11	模厚調整進退 Die height adjustment.	動作禁止,安全門閉緊後,模厚調整開關在中立位置,再操作才會動作 Action against, close security doors , the die height adjust switch in the neutral position, and then operations will move
型交換 Die change	1	型開閉 Die opening and closing	動作可(低速動作) Action can be(Low-speed operation)
	2	押出前進後退 Ejection forward and backward.	動作可(低速動作) Action can be(Low-speed operation)
	3	中子抽插 Core in/out	動作可(低速動作) Action can be(Low-speed operation)
	4	射出前進 Injection forward	動作可(低速射出) Action can be (Low injection)
	5	射出後退 Injection retract	動作可 Action can be

	6	取出機型內前進 Extractor move in die space	動作可(低速動作) Action can be(Low-speed operation)
	7	取出機其他動作 Extractor other actions	動作可 Action can be
	8	噴霧機上下 Auto Spray up and down	動作可(低速動作) Action can be(Low-speed operation)
	9	噴霧機噴霧吹氣 Auto Spray die coat spray and air blowing	動作禁止,但噴霧機在下限位置的情況,並且關上安全門就會動作 Action against, but the auto spray in the lower position and close the security door will active.
	10	調模進退 Die height adjust	動作可 Action can be
半自動 Semi-automatic	1	型閉 Die Closed	動作暫時禁止,安全門閉合後,雙手押扣曲手啟動按鈕,啟動關模動作. Action against. But close Safety door and Both push die close switches.
	2	型開 Die open	動作暫時禁止,安全門閉合後,動作繼續 Action interrupt, security doors closed, the action continues
	3	押出進退 Ejection retreat	動作可 Action can be
	4	中子入 Core in	動作暫時禁止,安全門閉合後,動作繼續 Action interrupt, security doors closed, the action continues
	5	中子出 Core out	動作可 Action can be
	6	關模完了-射出啟動按鈕 Die closed-injection start	給湯機自動的情況,射出啟動按鈕動作禁止,取消給湯機自動模式,機台在自動模式,按鈕即可射出 When auto ladle in auto mode, injection start button action against. Auto ladle in manual mode , push injection start button will active injection.

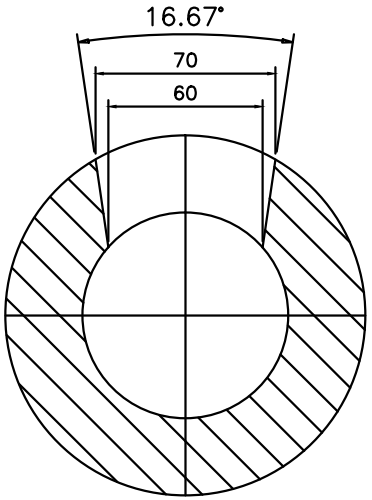
	7	射出前-冷却計時器 Injection - Cooling timer	動作禁止,冷却計時中斷並且需手動方式將各部回原點再重新操作 Action against, the cooling time will interrupt and need to manually operation re-homing
	8	射出後退 Injection Retract	動作可 Action can be
	9	取出機型內前進 Extractor forward into die	動作暫時禁止,安全門閉合後,動作繼續 Action interrupt, security doors closed, the action continues
	10	取出機/其他動作 Extractor / other actions	動作可 Action can be
	11	噴霧機上下 Auto Spray up and down	動作暫時禁止,安全門閉合後,由吹氣 1 重啟吹氣,噴霧動作 Action interrupt, closed the door will restart from the air blow1, spray action
	12	噴霧機噴霧/吹氣 Auto Spray die coat spray / blow	動作禁止 Action against.
	13	調模進退 Die height	給湯機繼續進行,但機器各部動作中斷進行並且需手動返回各部回原點,再進行啟動 The auto ladle continued, but interrupt the machine operation and need to manually return to the origin, then the start
全自動 Automatic		全動作 All Action	



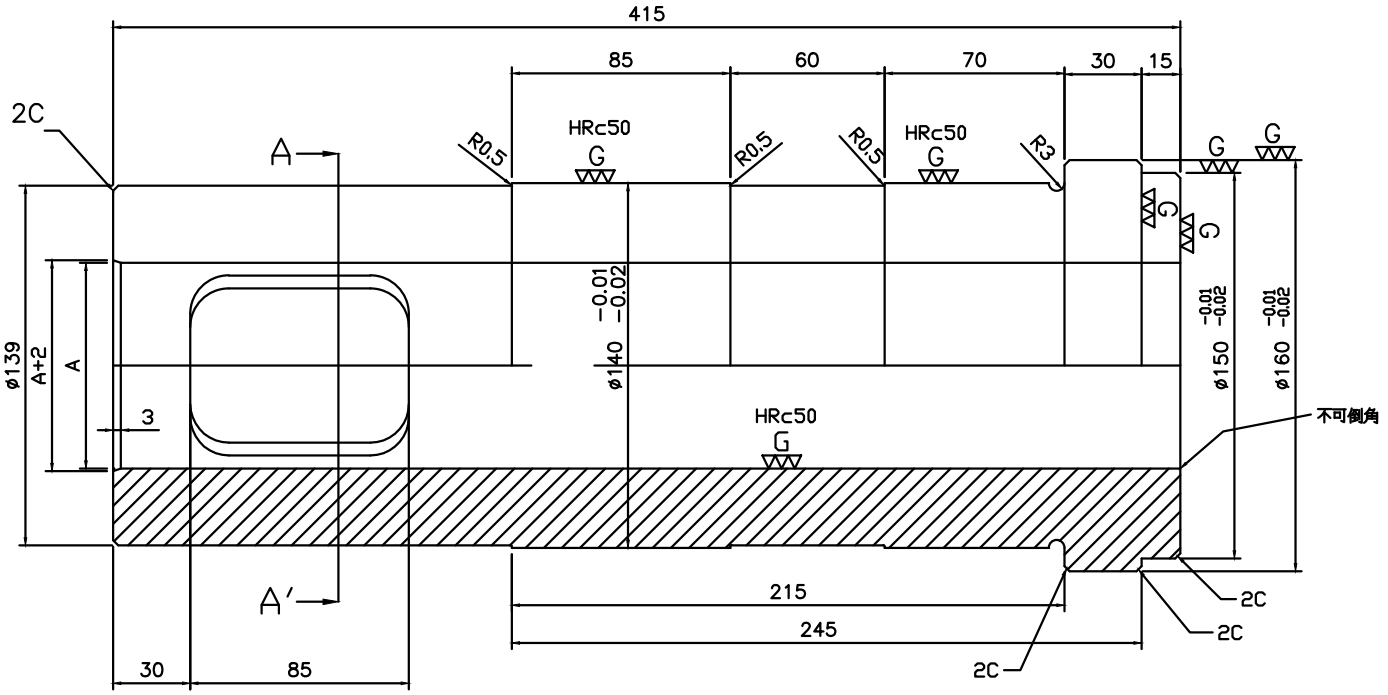
未標示之圓角均為R2

原圖號:605-01

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	料管襯套	2011年版
檢圖		DC-650 V3C		材質	黑皮鐵	比例	F		圖號	650V3-04-01	第1頁
設計				數量	1	日期	2002/04/27				



A–A′剖面

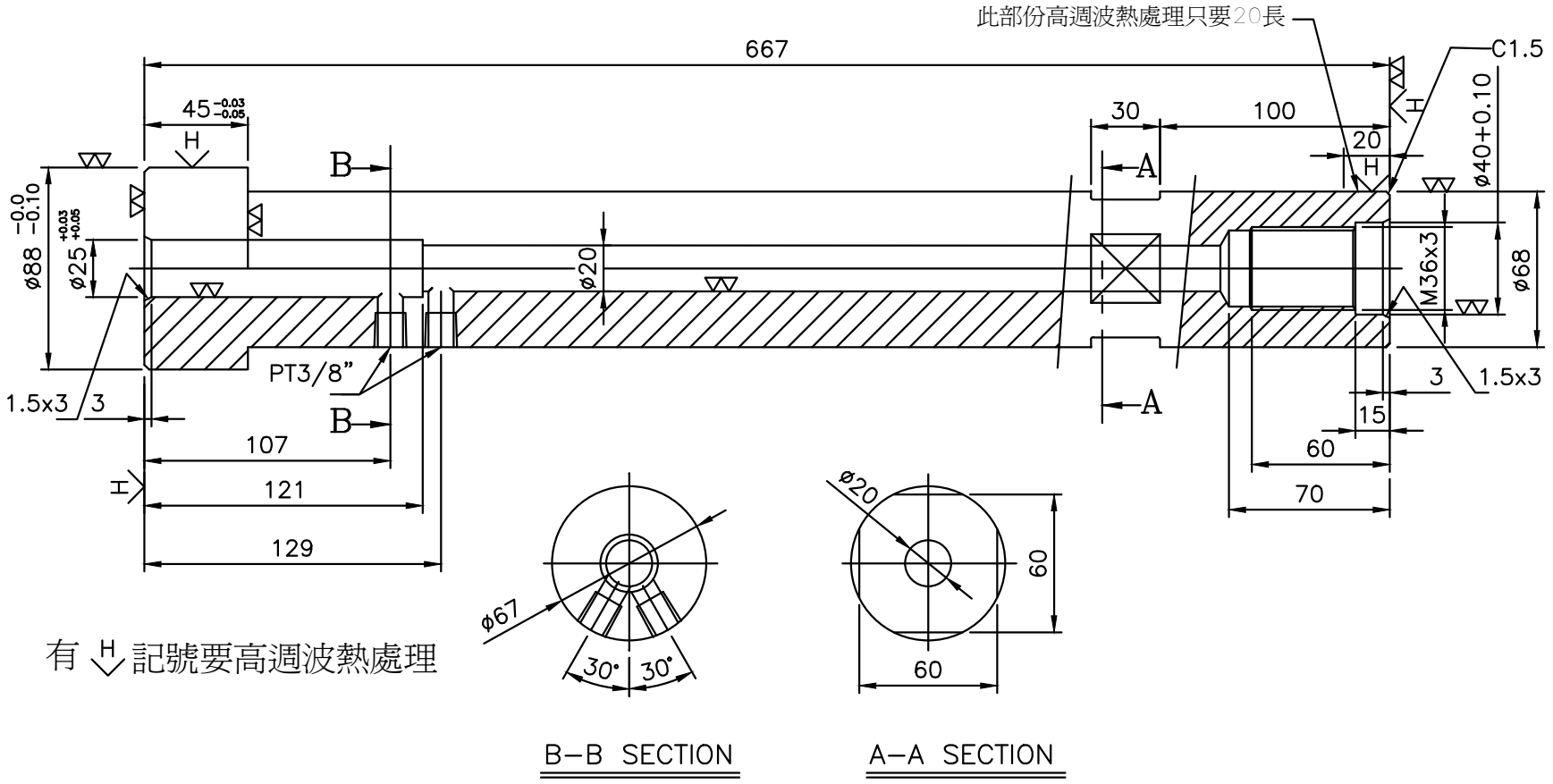


1.車床
2.銑床
3.熱處理
4.研磨
5.氮化

	A
1	$\phi 70^{+0.05}_{+0.06}$
2	$\phi 80^{+0.05}_{+0.06}$
3	$\phi 90^{+0.05}_{+0.06}$
4	$\phi 100^{+0.05}_{+0.06}$

原圖號:605-02

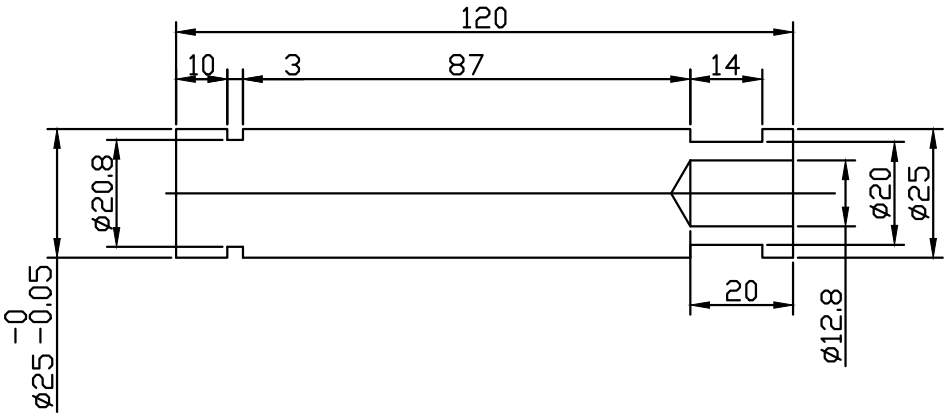
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	料管	2011年版
檢圖		DC-650 V3C		材質	SKD-61	比例	F				
設計				數量	1	日期	2011/02/16		圖號	650V3-04-02	第1頁

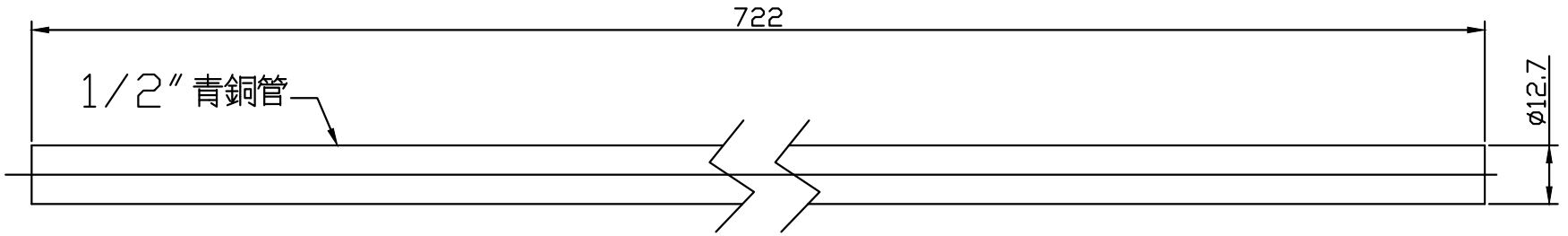


有 H 記號要高週波熱處理

原圖號:605-04

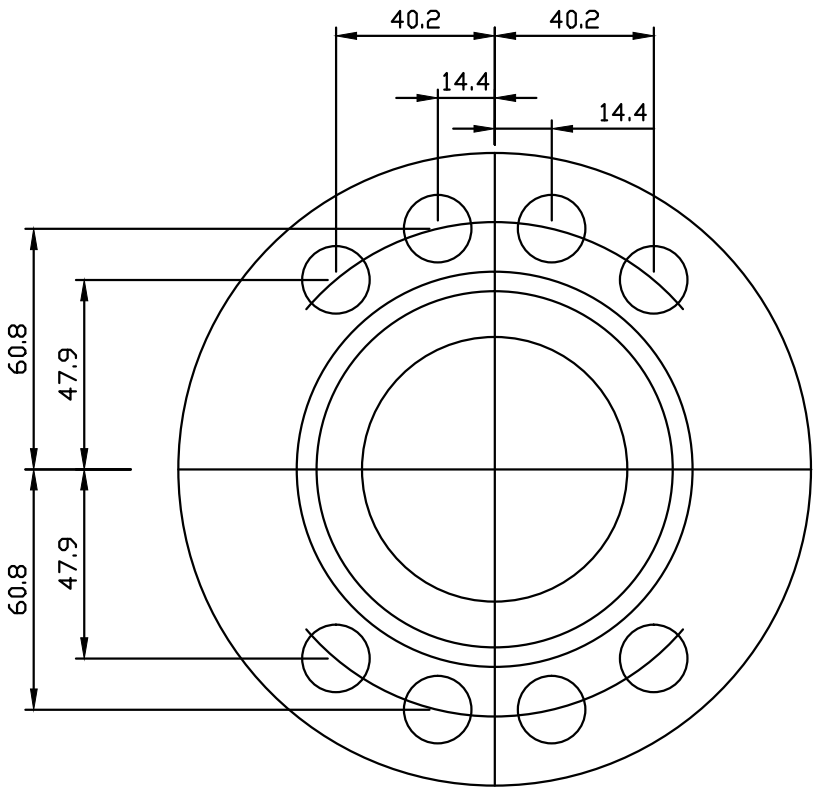
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射料桿	2011年版
檢圖		DC-650 V3C		材質	SCM-4	比例	F				
設計				數量	1	日期	2002/04/27		圖號	650V3-04-04	第1頁

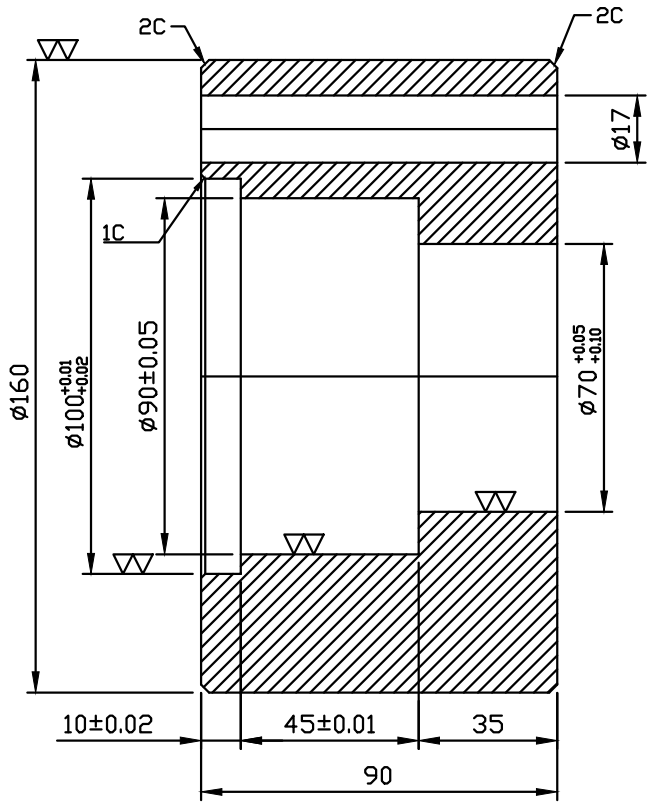




原圖號:605-04A

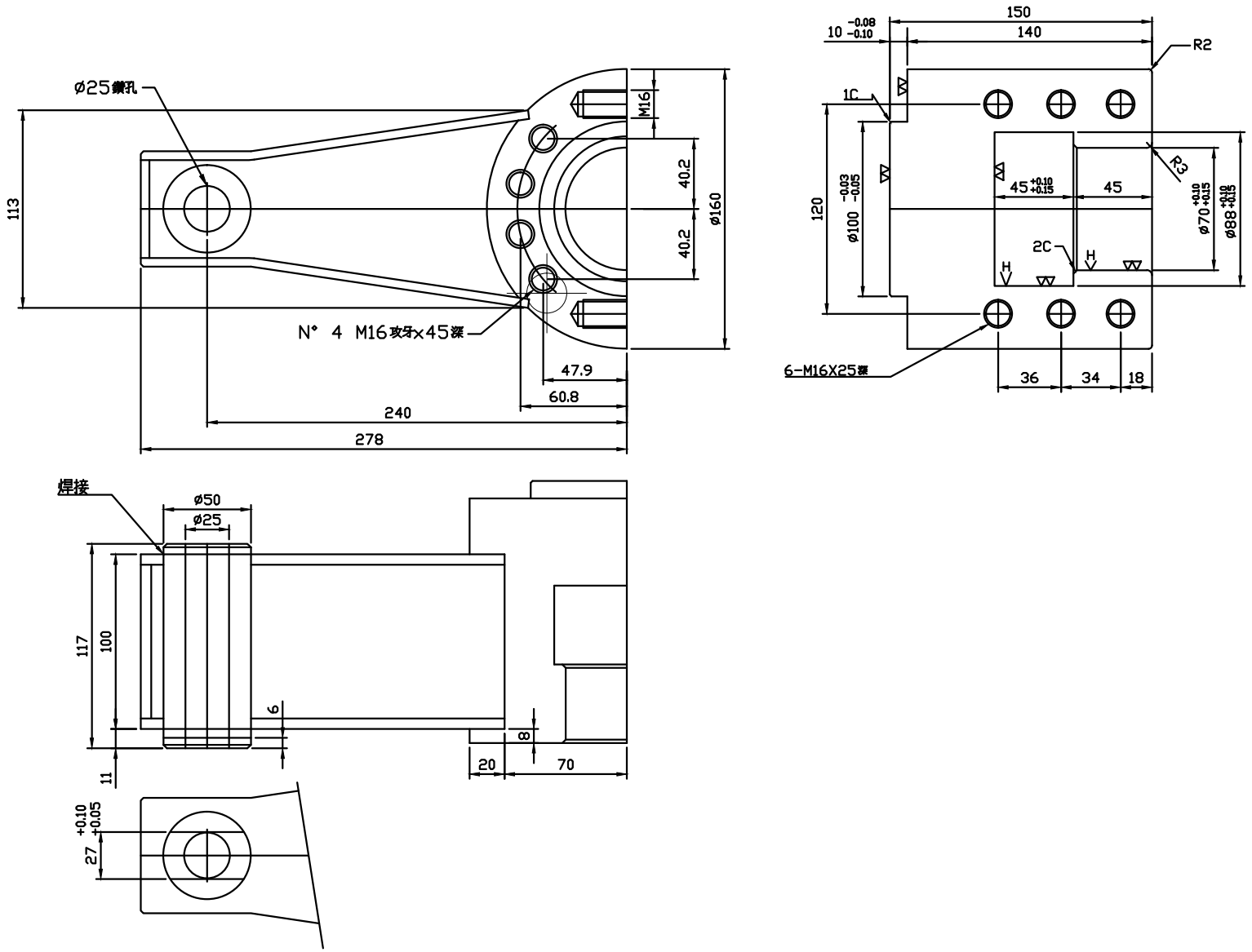
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射料桿冷卻水路頭	2011年版
檢圖		DC-650 V3C		材質	青銅	比例	F		圖號	650V3-04-05	第1頁
設計				數量	1	日期	2006/03/25				





原圖號:602-08

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射桿結合器外蓋	2011年版
檢圖		DC-650 V3C		材質	SCM-4	比例	F				
設計				數量	1	日期	2002/04/27		圖號	650V3-04-07	第1頁



原圖號:605-08B

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射出結合器	2011年版
檢圖		DC-650 V3C		材質	S45C	比例	F				
設計				數量	1	日期	2009/06/05		圖號	650V3-04-08	第1頁

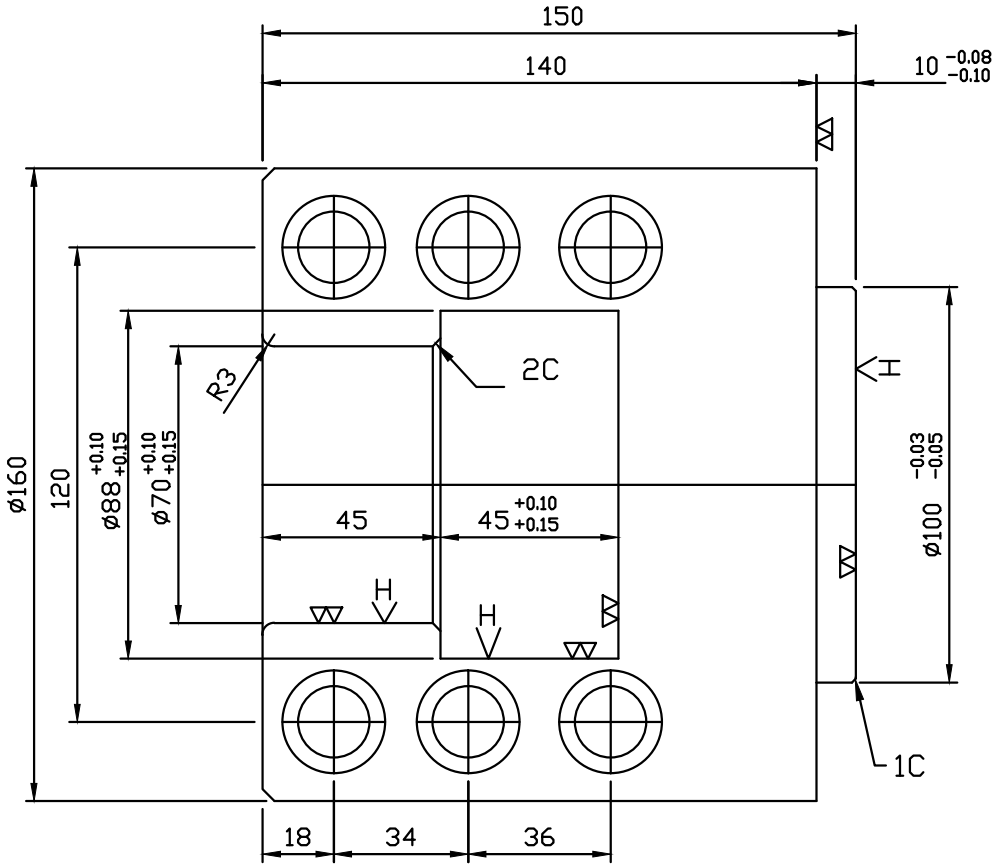
加工程序

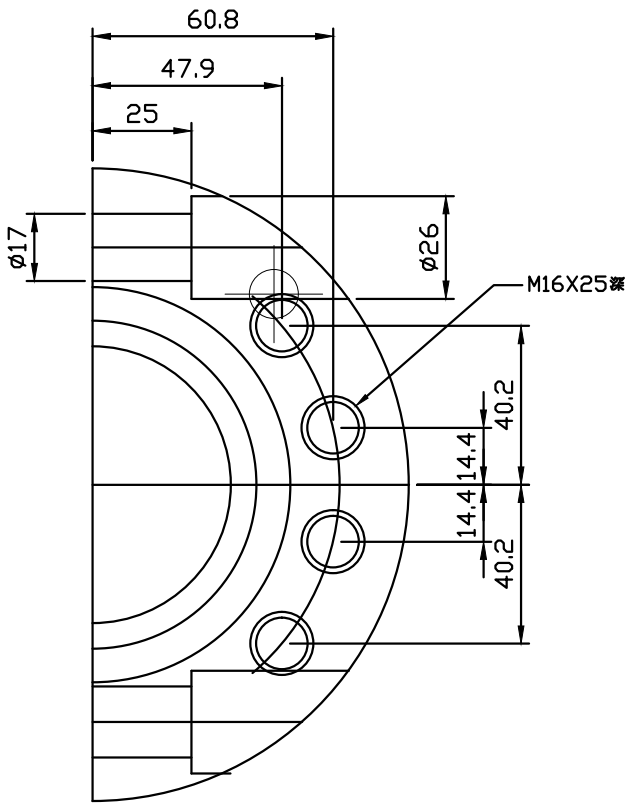
①車

②銑

③鑽孔

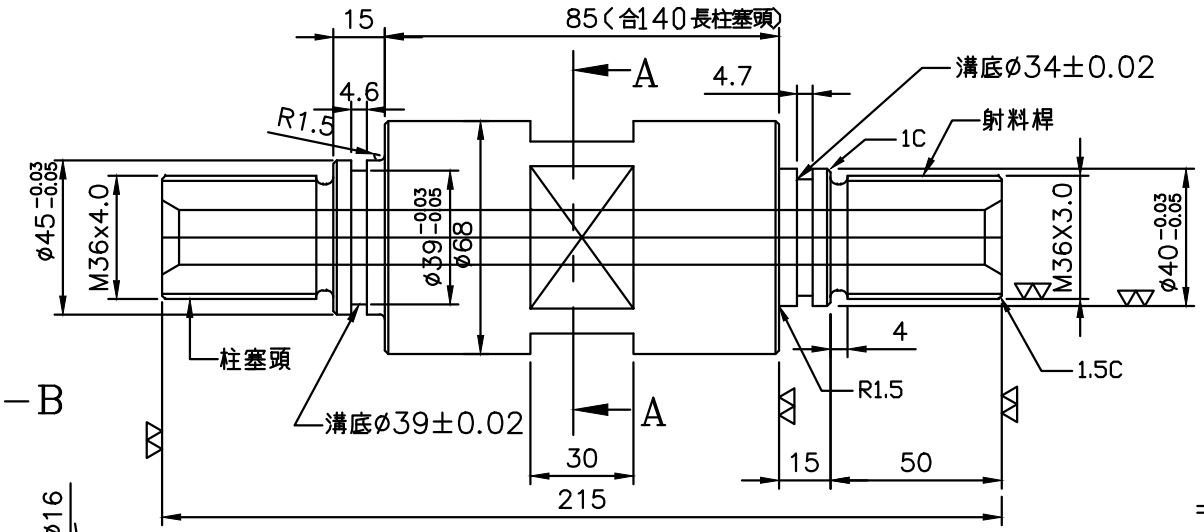
④高週波

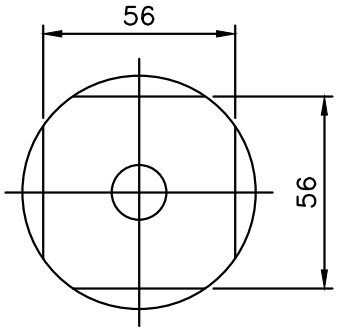




原圖號:605-08F

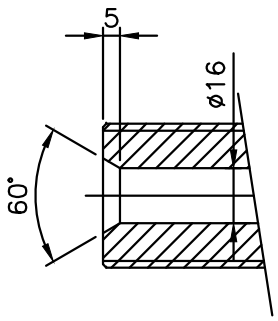
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射出結合器	2011年版
檢圖		DC-650 V3C		材質	S45C	比例	F		圖號	650V3-04-09	第1頁
設計				數量	1	日期	2002/07/04				





A—A SECTION

B—B

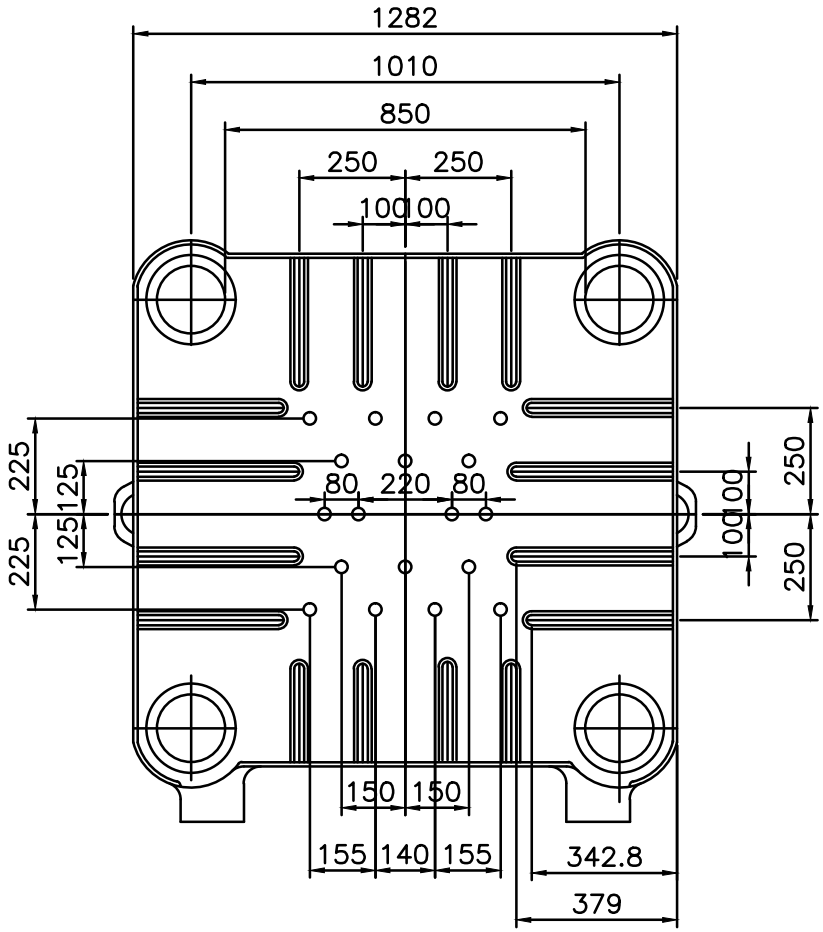


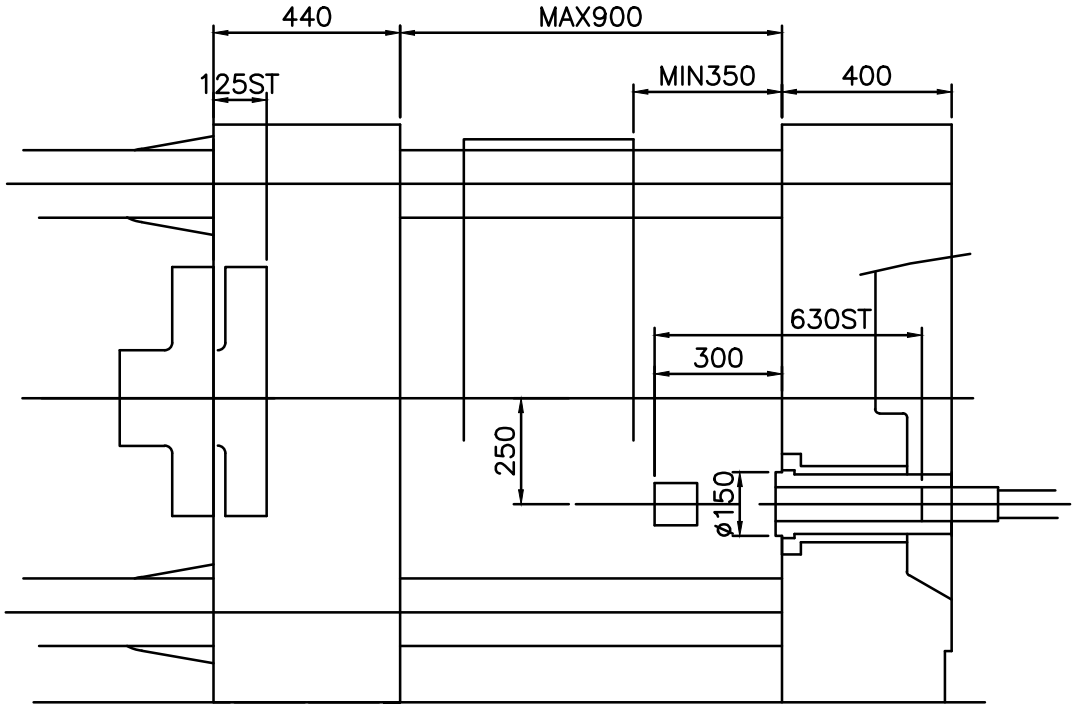
B—B SECTION

兩端牙距不同

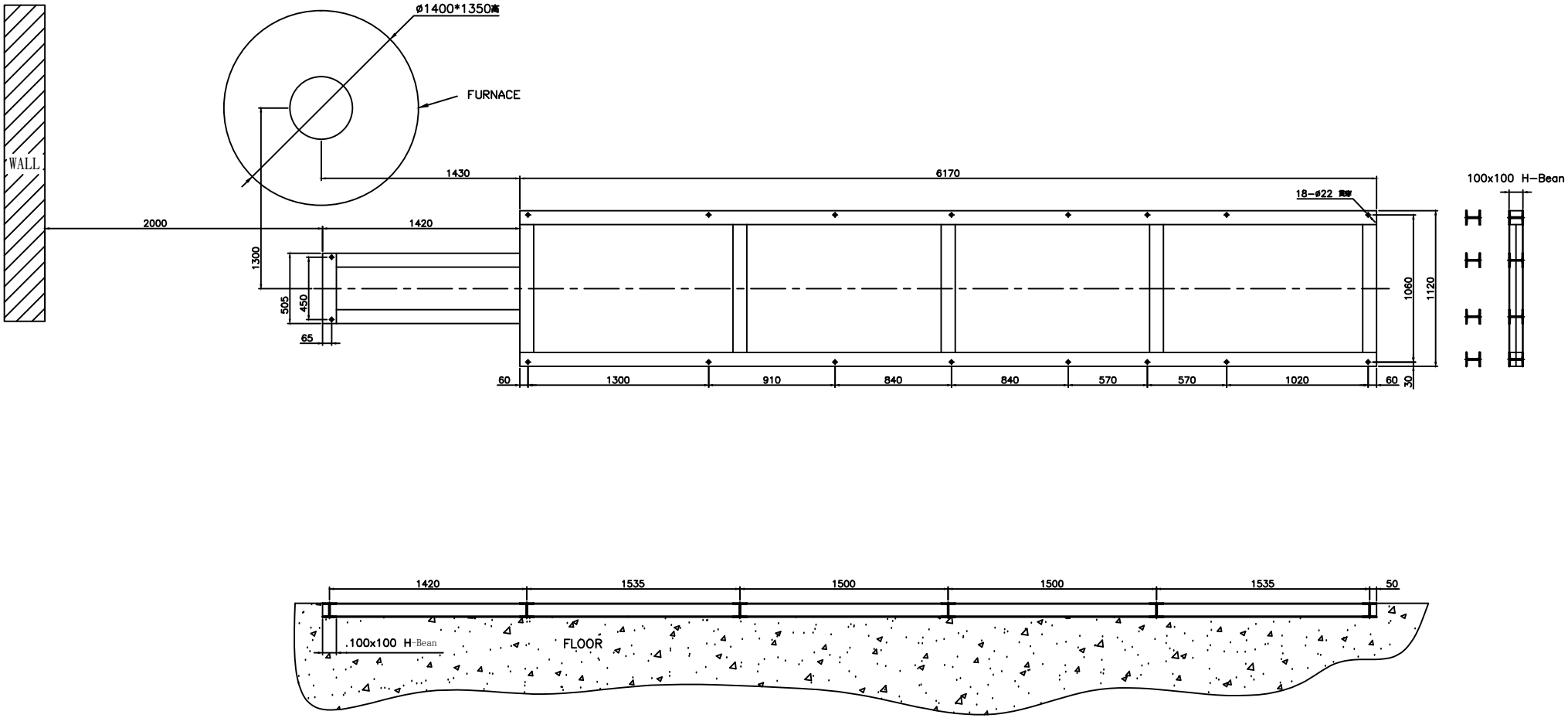
原圖號:605-11

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射桿連接頭	2011年版
檢圖		DC-650V3C		材質	SCM-4	比例	F				
設計				數量	1	日期	2009/06/05		圖號	650V3-04-10	第1頁





核準		機　型	永欽機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	模面圖	2009年版
檢圖		DC-650V3C		材質		比例	F				
設計				數量	1	日期	2012/02/17		圖號		第1頁



核準		機　型	永欽機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	地基圖	2017年版
檢圖		DC-650V3C		材質		比例	F				
設計				數量	1	日期	2017/12/18		圖號	650V3C-14-00	第1頁

AUTO LADLE

SAFETY INSTRUCTIONS AND PRECAUTIONS

1. Thoroughly read this Instruction Book and accompanying operation manual before installing, operating or servicing EVERGREAT machine.

2. EVERGREAT machines are highly technological and sophisticated. Only skilled persons having the requisite level knowledge and competence are to be entitled to instal ,operate ,or service EVERGREAT machine.

3. Always follow all of the instructions given in this instruction book ,accompanying operation manual whenever engaged to install operate or service the machine of "EVERGREAT".

4 Always wear safety glasses when installing operating or servicing EVERGREAT machine to protect your eyes from flying materials.

CONTENTS

1.Specifications. AL-42

1.pouring amount	: MAX 3.5kg
2.pouring accuracy	: ±2% per 1kg
3.pouring cycle	: 14 sec
4.Driving Arm	: AC motor 0.75KW
Ladle	: AC motor 0.4KW
5.Diameter of crucible	: Ø 550 or larger
6. Ladlable depth	: 480mm (max)
7. Applicable die casting machine	: DC-250V3C, DC-250V4N, DC-420V3C, DC-420V4N
8. power source	: AC 200V
9. Control circuit	: DC 24V
10. power capacity	: 3.0KVA
11. power control	: Centralized control by control panel of die casting machine
12. Control unit	: PLC
13. Adjustment for pouring amount	: Digital control
14. Ladle	: 3.5 ladle (420) 2.5 ladle (150.250.420) 1.6 ladle (150.250.420) 0.8 ladle (150.250)
15. Machine weight	: 245kg
16. Sensor	: For ladle encoder, one
17.Molten metal quantity control	: The biscuit thickness is detected and, always, the molten metal quantity is controlled to maintain the proper thickness.
18. Standard specification	: 1)Early pour (1) In the arm advance condition, the ladle is kept waiting in the position that the ladle is rotated a certain angle toward the pour side, thus the pouring time is short end. 2)Early pour (2)It starts from the position of high pressure die close.
19.Option	: 1)Molten metal face drop signal relay output. 2)Jump start circuit of the in-furnace-wait timer that works at the time when the die locking starts.

Remark) The specifications are subject to change without notice.

2.Setting-UP (As for the setup method, see the operation manual).

2-1 Arm position.

Though the arm position has previously been set, the “arm retract limit” must be readjusted after installation as it has a relation with the depth of crucible.
Also, it is sometime necessary to re-set the “arm retract, wait position ”as it has a relation with the crucible.

1)Setup of “arm retract limit” LSR

Fit the largest ladle in position, and adjust it to the “least ladling ”point.
Then, put the arm into “retract” position in the crucible.(Descend).
In case if the arm does not stop ever though the ladle bottom face come down to the point of 50mm above the crucible bottom, the setup point of “arm retract limit should be adjusted.
Due to a drop of melt level, it is possible the ladle directly hits the crucible.
To avoid this danger, be sure to confirm the “arm retract limit ”position and Carry out re-setting, if necessary.

2) “Retract wait” position. LSW

The arm will retract and stop at the “retract wait” position after pouring.
The setup is to be done in a manual that the ladle comes over the crucible when Stopped.

3) Arm “advance slow-down” LSFF

The arm advance high speed will be changed-over to “low speed” at this setup Point. the point of this change-over is to be set in the position just before the advance limit.

4) “Retract slow-down”. LSRF

The arm retract high speed will be changed-over to “low speed” at this setup point.
The point of this change-over is to be set position just before the “retract wait”.

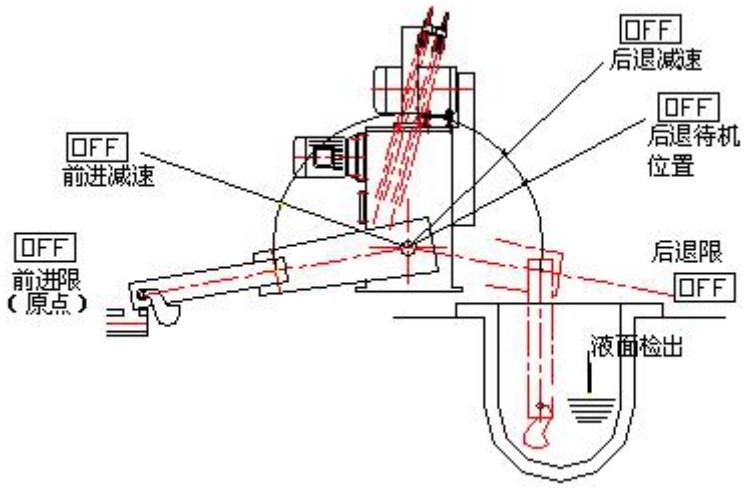
5)LSF 2“advance over-run”(limit SW).

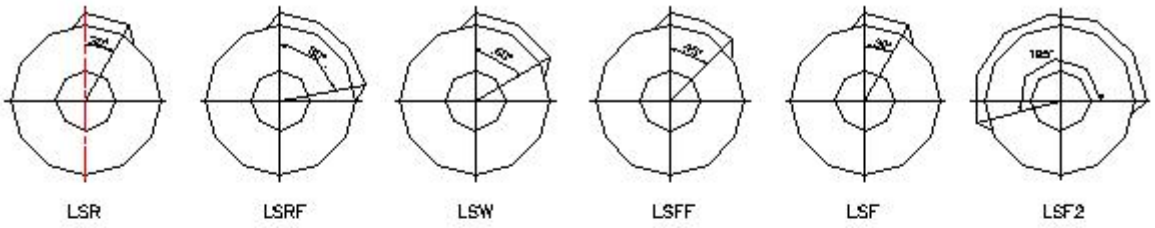
If this SW is touched, the arm stops emergently at the advance limit, The SW is to be set in a manner it is touched at the point just behind the advance limit.

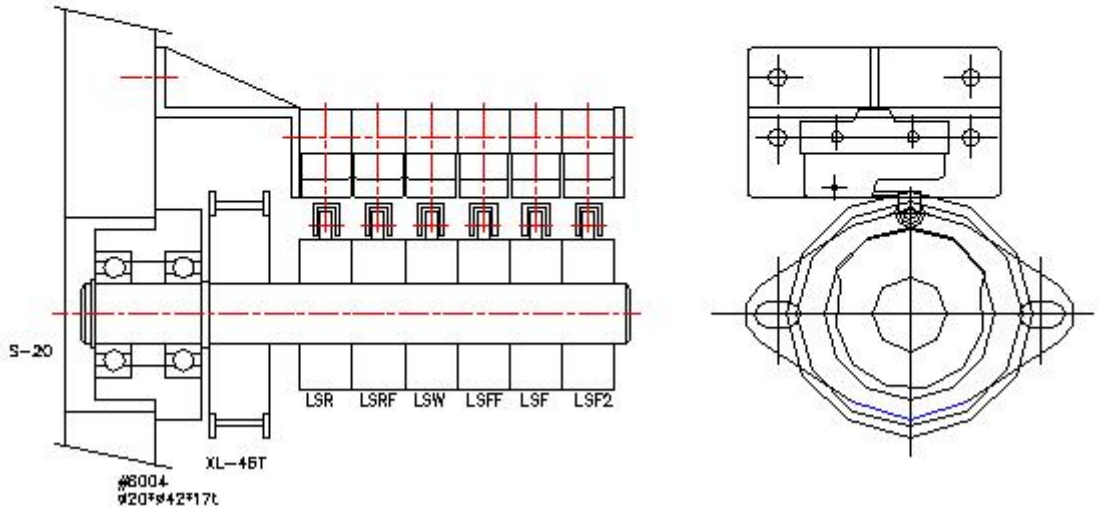
6)LSF “ advance position”(limit SW).

If this SW is touched, the arm stops at sleeve side limit, The SW is to be set in a manner it is touched at the point just beyond the sleeve pour port.

Arm limit switch position







2-2 Ladle position.

1) “Pour limit”. LSPF
This means the position of “ladle pour turning limit”. When the ladle comes to this setup point, the ladle stops to turn, and completes pouring.

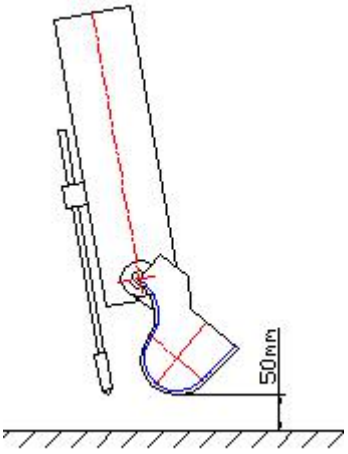
2) “Transfer posture ”. LSPH
The ladle turns around from the ladling posture to the pouring direction and when the ladle comes to this setup point, it stops. The setup is to be made with consideration the ladle stops in a shape a little bent forward above the horizontal line in order not to have the melt spill out of the ladle while transferring.

3) LSPR “ladling limit”
At this setup point, the ladle’s ladling-direction turning stops.
4) Metal amount adjust
The ladle turn angle was measured by the encoder.

2-3 Irregularity in pouring amount.

The melt amount is measured in a manner that the ladle is declined, and the molten is forced to overflow from the ladle. The status of overflowing delicately varies depend on the shock when the arm stops at top, or the change of molten temperature, or the slug the face of molten. It is hardly possible to prevent such irregularity, but can be reduced to certain extent if followings are attended to.

1) The ladle has been designed to stop about 50mm above the molten level in furnace after “in-furnace-wait”, If the ladle has vibration at such stop, the “wait l speed” is to be reduced.

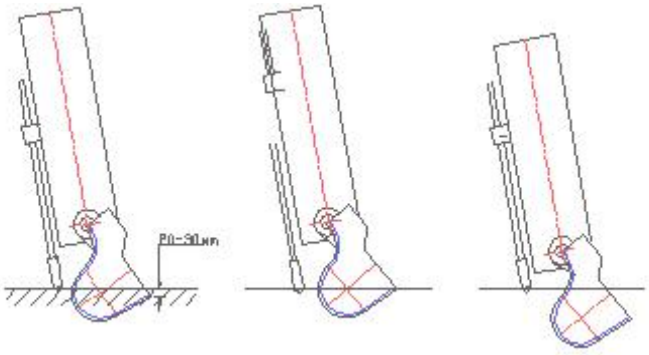


2) The ladle has been designed to stay over the furnace for the purpose to let the molten in ladle to overflow. The time of such stay is set on the measure timer. The setting time must be long enough to let the molten completely overflows.

2-4Adjustment of electrode bar for melt

Surface sensing.

At the arm retract, when the electrode bar touched the melt surface, the arm stops. When the arm stopped, the ladle must be in “ladling status” and be under the melt surface by 20~30mm in depth or more. For this purpose, the electrode bar for melt surface sensing and electrode bar for grounding are to be adjusted, upward or down-ward, to keep such distance.



Ladling port to be under melt surface by 20~30mm in depth.

If electrode lowered too much, the melt can not Go into the ladle.

If electrode lifted too much, the ladle sinks in the melt too deep.

The electrode bar for melt surface sensing and its wiring are insulated off the body of unit, and the grounding bar is earthed to the arm. The float less switch functions when the electrode bar touched melt surface via the current that runs from grounding bar to the body of unit. when the switch functioned, the motor

stops. In that connection, The following points must be remembered.

1) If any insulation material be coated on electrode bar or grounding bar, no current goes through, eventually, float less switch does not work, making the arm run into the furnace. The electrode bar and grounding bar should never be coated with any insulation material.

2)In the following cases, the float less switch functions, either by “auto” or “manual”.

a) when aluminum fractions are adhered to the fixing portion of electrode bar for melt sensing.
b) when the insulation coverings of wiring damaged to come off, and become shorted with the arm.
c) when electrode bar touched the die casting machine at the time of “arm advance limit”.

Float less switch can be confirmed if it is working or not through the “auto” Screen of control panel.

3) If fixing block of electrode bar(insulated material) gats wet by spray liquid, the block becomes un-insulated, and float less switch functions. Therefore, such block must be kept dried at all times.

* Electrode bar for overrun.

This is for emergency when the arm does not stop even though the ladle sensor the touching with melt surface.

When the ladle touched melt surface, float less switch functions, the motor moves adversely, buzzer sounds and the error message is displayed. Usually, this electrode stands untouched with melt, no need of coating thereon.

4)In case of disconnection of melt surface sensing wiring, the disconnection alarm circuit works, buzzer sounds and the disconnection alarm error message is displayed. if this happened, the wire to be renewed.(Heat resistant wire).

3. Maintenance inspection.

3-1 Inspection for ladle.

1)one unit of ladle is always kept available as “spare” an replaced at interval of every 48 hours. That is one unit of ladle is always stocked being coated with titanium oxide and, ladle is fit taking the place of used one. The used ladle is to be soaked in the melted natal to get rid of the aluminum stuck around the ladle. The remaining aluminum on the ladle is scraped off by hand and the ladle to be coated with titanium oxide and stocked as “spare”.

2) When coating the titanium oxide the care must be taken to the following points. The coating must applied after the ladle and hopper are completely cooled off. The thick coating must be avoided. It is better to apply a thin coating in twice. The enforced drying should be avoided. Instead, make it dried gradually being placed by the holding furnace.

3)It sometimes happens that the die cast alloy sticks around the electrode in a foam of icicle. In that case, the die cast alloy must be taken off since it causes an error in the molten quantity. The touching face of ladle is regularly polished by the fine sandpaper.

3-2 Lubricant.

1)Lubricant for reduction gear.

The lubricant is filled in reduction gear when shipped. However, it is recommendable to confirm if the oil level is at the middle point of oil gauge. After 10 days of initial operation (about 100 hours)the lubricant must be replaced With new oil, whereafter renew the lubricant semi-annually or at the interval of 2,500 hours of operation,whichever may appear first. When renewing it is recomemend able to clean the inisde of reduction gear.

Oil reservoir capacity

* on top of main body 4.0&
* At bottom of main bady 6.5&

RECOMMENDABLE OIL

Viscosity	ISOVG 460
Dynamical V. Cst mm^2 /S(40℃)	414-506

MAKER	BRAND
ESSO S.D	SPARTAN EP 460
Mobil	Mobil GEAR 634
Shell	Shell OMALA 460

2) Lubricant for the ladle arm ladle rotary axis and the chain.For the ladle rotary bearing portion the scale-shaped graphite powder is sealed-in,it is necessary to renew them regularly.Remove the ladle arm bottom cover and clean isdide. The take off the side cover and put about 80cc lubricant.

* Replace at interval of 2,500 hours
* Scale-shaped graphite powder 300 mesh

For the bearing and the chain,no grease nor commone oil is uesd.

3-3 AC Motor & inverter maintenance.

1)AC motor uses general three-phase motor and no special maintenance is required. However, if the coil insulation become ineffective dry up the coil and if the coil become very dirty Carry out a cleaning of coil. When a motor starts moving a slight creaky-sound comes out, but,such sound is not abnormal.(The inverter's characteristics).

2)Inverter.

A.Outlne.

In order to make the ladler work in a normal manner,various parameters are input in the inverter.Do not alter these parameters to avoid malfunction of ladler.This inverter does not need "replacement"of battery.

B.Inverter.

When the power source is "ON" the figures then indicated usually represent the frequency then output.(In proportion to the speed).If "MODE"key is pressed the parameter contents can be displayed,however,for security,you had better not the mode key.

C.Inverter maintenance.

a.Cooling fan : The fin cooling fan is installed on the arm inverter (INVA).The service life of this fan is about 2 years (on the basis of continuous-use). If any trouble took place on the fan causing itsstoppage the "FN"indication is shown on the inverter panel. However,as long as the ladler is used in an usual cycle of about 12 seconds,the cooling fan is not so heated that the fan ca be used as it is without stopper.If the cooling fan is overheated the "E.FIN" indication is displayed and the inverter stops.

It is therefore suggested to replace earlier than usual in the system is used in summer or used in the cite of high temperature.

b.Condenser :Each inverter has 2 condensers.The condenser function varies according to the envirnments.The normal service life of it is about 5 years.

As to the details of inverter,refer to the Inverter Instruction Manual placed inside the control panel.

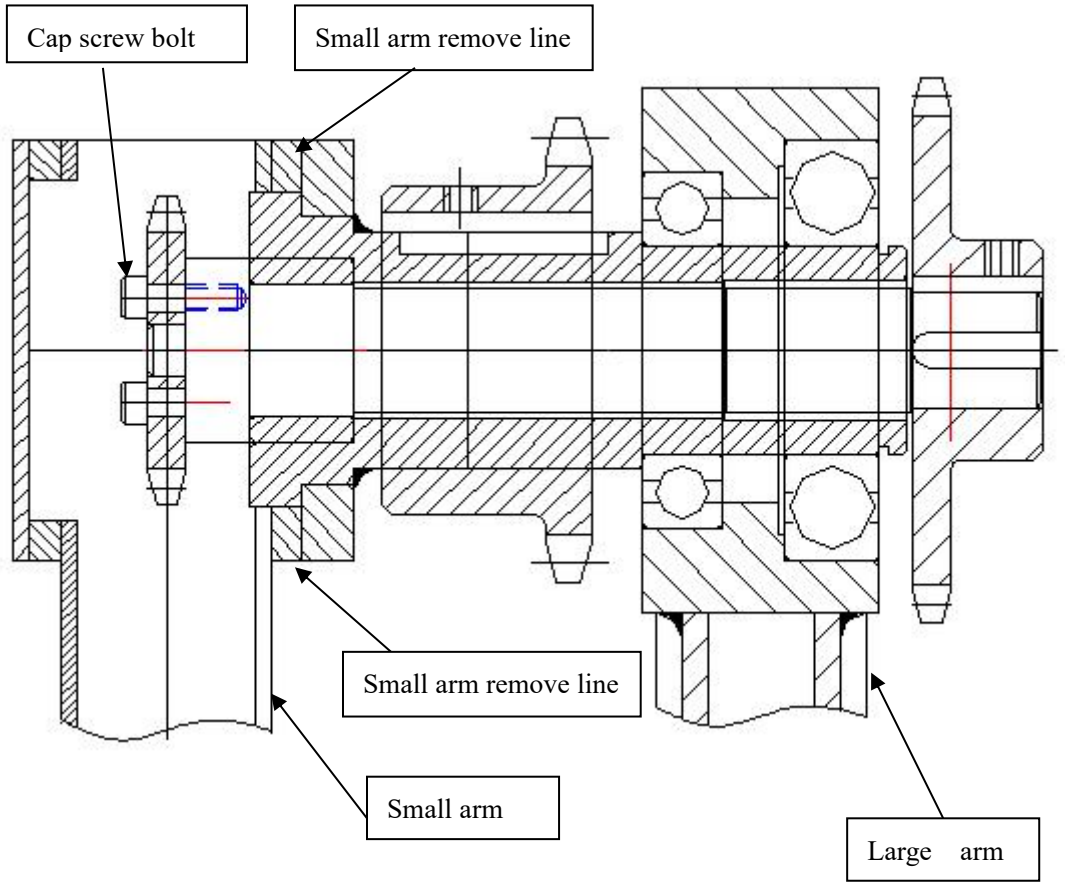
Inverter Error list:

Indication on inverter panel	Description	Contents	Countermeasures
E.0C1	Overcurrent during speed-increase.	lnverter output current exceeded 200%	Lower the speed. (Speed-increase time to be lengthened)
E.0C2	Overcurrent during constant speed.	Same as above.	Lower the speed.
E.0C3	Overcurrent during constant speed	Same as above.	Lower the speed. (Speed-derease time to be lengthened)
E.ov1	Overcurrent during speed-increase.	Over-energy when brake functioned.	Lower the speed. (Speed-derease time to be lengthened)
E.ov2	Overcurrent during constant speed.	Same as above	Lower the speed.
E.ov3	Overcurrent during constant speed.	Same as above.	Lower the speed. (Speed-derease time to be lengthened)
E.THM	Motor over load. (Electronic thermal)	Thermal trip within the inverter.	Lower the speed or ladling cycle to be lengthened.
E.THT	lnverter overload.	lnverter output current exceeded 150%.	Lower the speed Load was overcharged.
E.FIN	Fin heating.	Cooling fin (Radiation part) was heated.	Check the fin function speed to be lowered.
FN	Fan trouble.	Fan stops.	Fan to be replaced.
E.BE	Brake circuit,abnormal.	Generation overenergy. Brake transistor,abnormal	Lower the speed. Ladling cycle to be lengthened.

E.0LT	Stall prevention (ln speed-increase) (At low speed) (ln speed-decrease)	When inverter rated current exceeded 150% the output is automatically suppressed	Lower the speed . Load was overcharged.

( ) When inverter stops due to any reason above turn off the power source once,and turn it on again.

3-4Small arm remove method



Small arm remove method

Remove 4 cap screw bolts.

Shown above ,and pull the arm

in the direction of arrow.

(plastic hummer can be used to give

a light knocking for easier

removal of the small arm.)

3-5 Checkup .

Where the daily checkup,1-month checkup,3-month checkup,6-month checkup.
1- year checkup,2-year checkup,4-year checkup.

Daily checkup

*** DAILY CHECKUP LIST ***

DAILY CHECKUP ITEM(BEFORE STARTING WORK)
1. Pump stops of emerg'stop button is pushed?Safety door move well?
2. Fluid oil not dirty or decreased?cooling water is running normally.?
3. Air pressure is 0.5MPa?
4. ACC charge pressure rises normally.?(High spd.12.2Mpa,int's24.4MPa)
5. Tip lubricant outlet & tip center agree each other.?NO clogging.?
6. NO galling on sleeve & tip.?
7. SW & LAMP work normally.?No.damage.?
8. NO adheison of aluminum or dust on ladler's electrode bar or block.?
9. Ladler is well covered by coating agent?Is it well maintained ladler.?
10. NO loosening of LS for safety hook,extract confm'tn & spray top limit?
11. When extr'or & spray are in die int'lck of die lock prohibit'n work weil?
12. When die locked int'lck of'no entrance'of extr'or &spray work well?
13. Air auto drain works normally.?
14. NO oil leak out of cylinder,valve,pipe & ladler reduction gear.?
15. NO abnormal sound out of pump motor & ladler motor.?
16. NO vibr'tn, abormal sound from cyl, togle,pointer,potentio-rack & gear?
17. When work is over clean each part.

Monthly,3-months checkup

*** PERIODECAL CHECKUP ***

CONDITION	RECPRD 4509	OPERATING 50:45:01	MAINTENANCE 2000
MONTHLY CHECKUP			0/ ×
1. Control panel fan moving?Cleaning of fan filter.?			×
2. 0'point of elec.flow control in right p'stn.?Low spd.0 setup:0.lm/s.			×
3. Ladler oil level (2 places) is up to center of oil gauge.?			×

4. NO dm'ge on wire of lad'r?Work stops if mid bar earthed.?	×
5. NO shock when arm & spray turn.?If any adjust shock absorber.	×
6. Cleaning of air filter inside.	×
7. Spray cyl not descend from top lmt. Even of press decreased to zero.?	×
8. NO scrach on tie bar & guide bar.?If any,search'cause'of scratch.	×
9. NO damage on pipes,hoses,wirings.?	×
10. NO leak of air, liquid.?If needed, tighten up or change packings.	×
11. Actual stroke of die open/close & eject meets actual value on page.?	
3-MONTH CHECKUP	
1. Grease-up all grease niples, Grease-coat of rack,gear,die higt gear.	×
2. Tip'0'ring to be replaced.	×
3. No galling or wear on tie bar.?Toggle pin fixing plate not loosened.?	×
4. Extractor clamp driving part & limit SW not loosened.?	

6-months, 1-year checkup

*** PERIODICAL CHECKUP ***

CONDITION	RECORD 4509	OPERATING 50:45:01	MAINTENANCE 2000
6-MONTH CHECKUP			o/×
1. Relay,timer firmly set? Wire not loosened?If much arcing change it.			×
2. Replace oil cleaner,air filter.Cleaning of suction filter.			×
3. ACC gas pressure normal?(Hi spd.6.1MPa int's 11.2MPa)			×
4. How is tension of ladler chain.?			×
5. Adjust die slide plate.			×
6. Sampling of fluid oil for maker's check.			×
7. Bolts,nuts & couplings not loosened.?NO clattering?			×
YEARLY CHECKUP			
1. Clean oil cooler.Change galvanized bar of oil cooler			×
2. Replace slide seals.			×
3. Replace suction strainer seals.			×
4. Silencer of extractor & spray replaced.Also,change air filter.			×
5. Change graphite of ladler arm & ladle.Replace electrode bar wiring.			×
6. Overhaul & clean spray manifold.			×
7. NO air leak out of air cylinder.?If any,change packings.			×
8. Measure die plate'parallel'by using die having 1/2ared if die plate.			×

2-years, 4-years checkup

*** PERIODECAL CHECKUP ***

CONDITION	RECORD 4509	OPERATING 50:45:01	MAINTENANCE 2000
2-YEAR CHECKUP			o/×
1. Change fluid oil Flushing of oil tank.			×

2. Change hydraulic hose.(All hoses) 3. All air hoses to be change. 4. Detection bar block of ladler to be changed. 5. Ladler arm bearings & ladle axis bushes to be changed. 6. Ladler small arm chain to be changed. 7. Ladler gear oil to be changed.	× × × × × × × ×
4-YEAR CHECKUP	
1. Timing belt of ladler to be replaced.	×

3-6 Obstacle and counter plan.

TROUBLE		CAUSE	CHCK OR COUNTERMEASURE
ARM MODE NOT RETRACT	Manually retractable, but not by the auto button SW.	*Disconnection of electrode bar wiring.	*Heat-proof wire is replaced.
		*Ladle did not go back to “ladling posture”.	*Driving unit of ladle to be checked.
		*Indication of ladle position did not reach the setup point of “ladling limit”.	*Inspection,Replacement.
		*Potentiometer out of order Re-adjustment, replacement.	
	Manually advansible,but “retract”not possible neither by “manual”or “auto”.	*Floatless SW is working.	*Confirm if relay of FLS1 is being lighted. Some part of the electrode-bar and/or wiring are in the “short circuit” condition
		*Electrode wire broke off.	*Confirm if relay of RB is light off . Replace a new wire.
ARM DOES NOT ADVENCE	After “arm ladling retract”, “measure rising” Not function.	*No “output” being sent From the float switch	*Confirm if relay of FLS1 is not lighted. Electrode must keep touch on the molten surface
	“Measure rising” available But “measure rising”not Possible either in “advance, Wait”or in “auto”	*Ladle position is not in the range between “transfer ”.LSPH	*Range of cam switch to be re-adjusted.
ARM	“Advance”, “retract”not	*Control circuit was	*Is die cast machine pump

	Availableeither “manual” Or in “auto”.	cut.	Working?
		*NO fuse breaker is OFF	
		*Error inverter	*Investigate the cause of overload trouble,and turn on the power source again.
		*AC motor out of order	
	Speed of “arm advance Retract”and “ladle turning” become“slow”,and thermal relay functions.	*Weight of bearing of ladle Driving unit is “heavy”.	*Loosen driving chain,and Check which bearing is “heavy”
		*Lever of A,B&C coves in Dull motion.	*Remove the back cover & check inside.

TROUBLE		CAUSE	CHECK OR COUNTERMEASURE
LADLE DOES TURN TO POUR DIRECEION	Ladle is hard to turn, and alarm message appears.	*Bearing of ladle driving unit is heavy.	*Loosen driving chain and Check which bearing is heaving.
	“Pouring”did not take Place even though arm is at advance limit.	*Signal of “die close Completion”was not issued	*Was “dieclose”completed?
		*Signal of injection retract Position” is not issued.	*Re-adjust position.
	After “measuring” ladle does not go to “transfer posture” LSPH.	*No “output” being sent From the inverter.	*
LADLE DPES TURN TO POUR DIRECTION	After “pouring”,at advance Limit, ladle does not go back To”transfer posture”,even if in manual mode.	*No “input” being sent From the relay RB. Or FLS1 signal was hold on.	*Check the electrode wire or replace it.
	After “pouring”, no shot Takes place also ladle does Not go back to “transfer Posture”	*Pouring limit switch signal not issued.	*Cam witch is to be re-adjusted.
LADLA DOES NOT TURN	On furnance side.The ladle Does not proceeds from “transfer posture”to “turning “for ladling or Pouring, The arm can go advance or Retract manually.	Error inverter.	*Investigate the cause of Overload trouble,and turn On the power sourece again.
		*0.4kw AC	
		*0.4kw AC motor inverter out of	
	Even though motor wants to	*Bearing of ladle driving	*Loosen driving chain ,and

	Move rotating,but,due to Hindrance,thermal relay Functions.	Unit is heavy.	check to find chich bearing is heavy.
" Over-run"message comes apper,and machine halts.		*Over-run LS dog got Loosened.	*Carry out re-adjustment.

4.Standard spare parts.

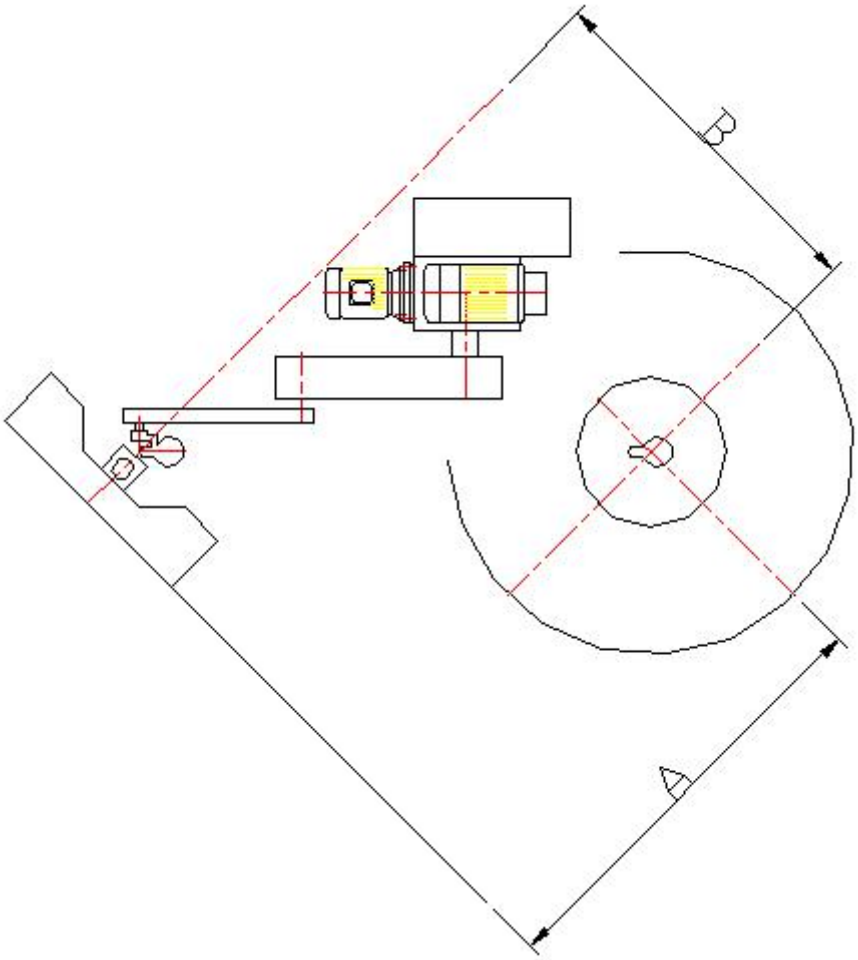
* DC-250V3C

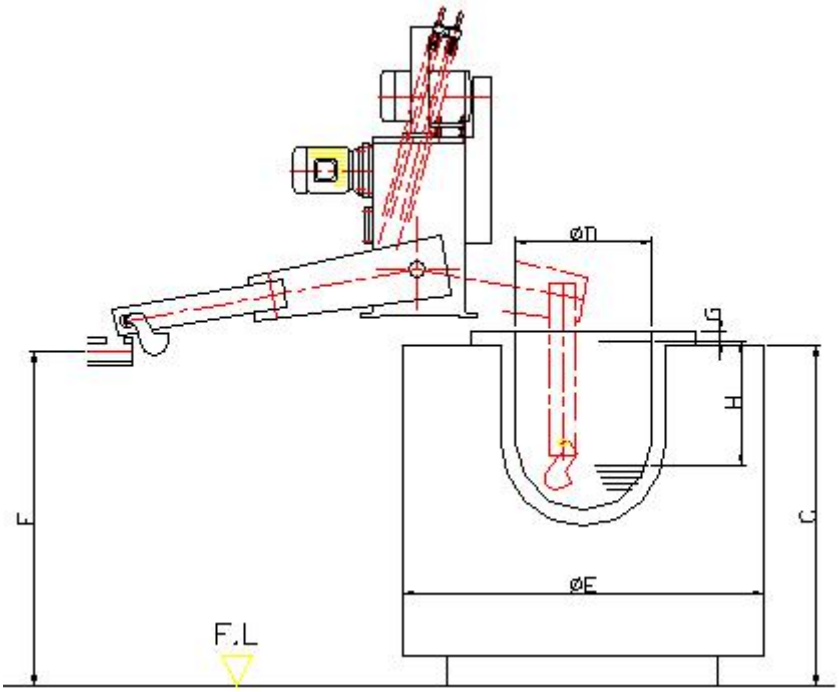
No.	PARTS NAME	MODEL	Q'TY	REMARK
1	Ladle	0.8	1	
2	Ladle	1.6	1	
3	Ladle	2.5	1	
4	Hexagonal bolt	M10*35	2	For ladle fitting
5	Washer	M10	2	

*DC-420V3C

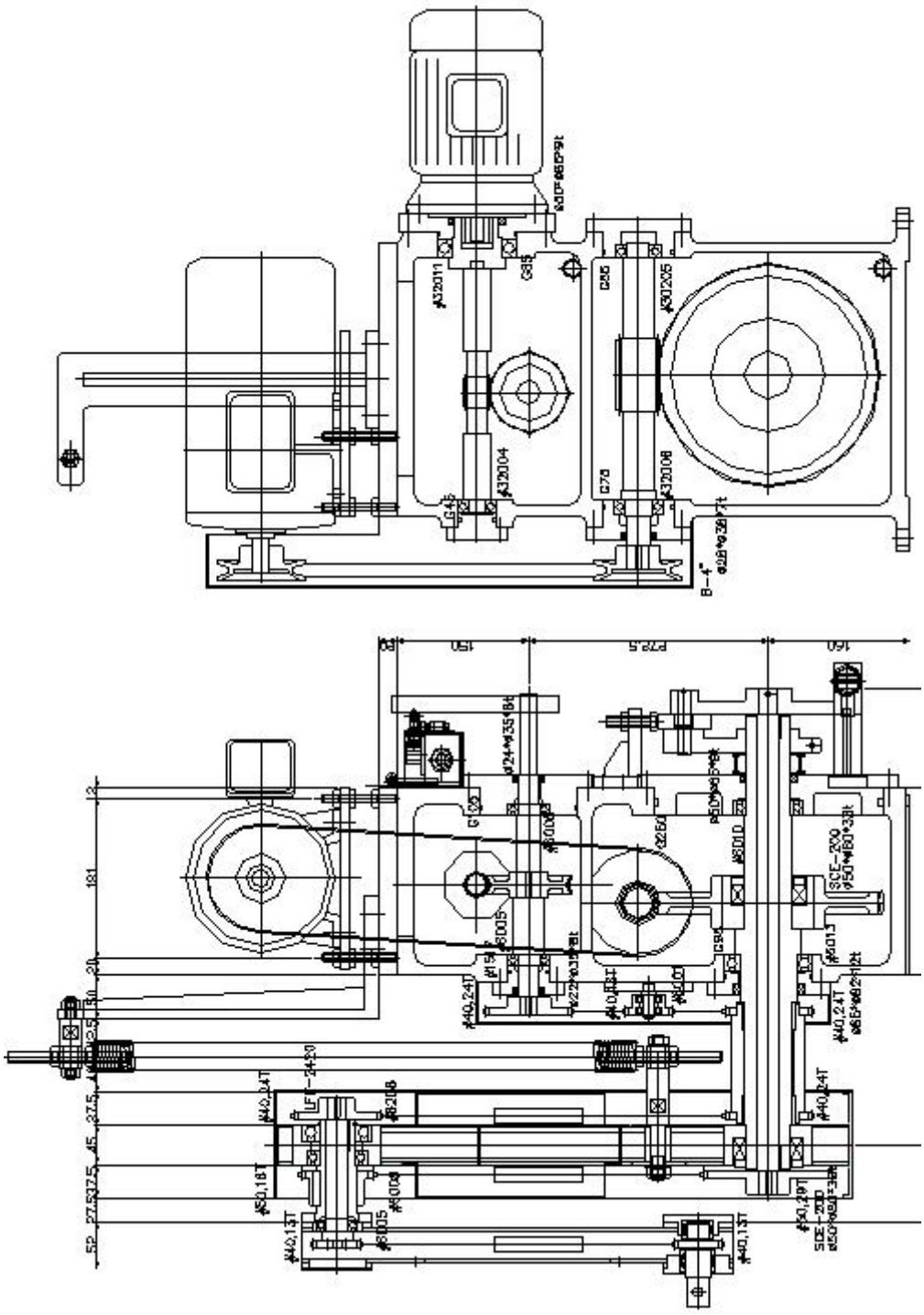
No.	PARTS NAME	MODEL	Q'TY	REMARK
1	Ladle	1.6	1	
2	Ladle	2.5	1	
3	Ladle	3.5	1	
4	Hexagonal bolt	M10*35	2	For ladle fitting
5	Washer	M10	2	do

General View

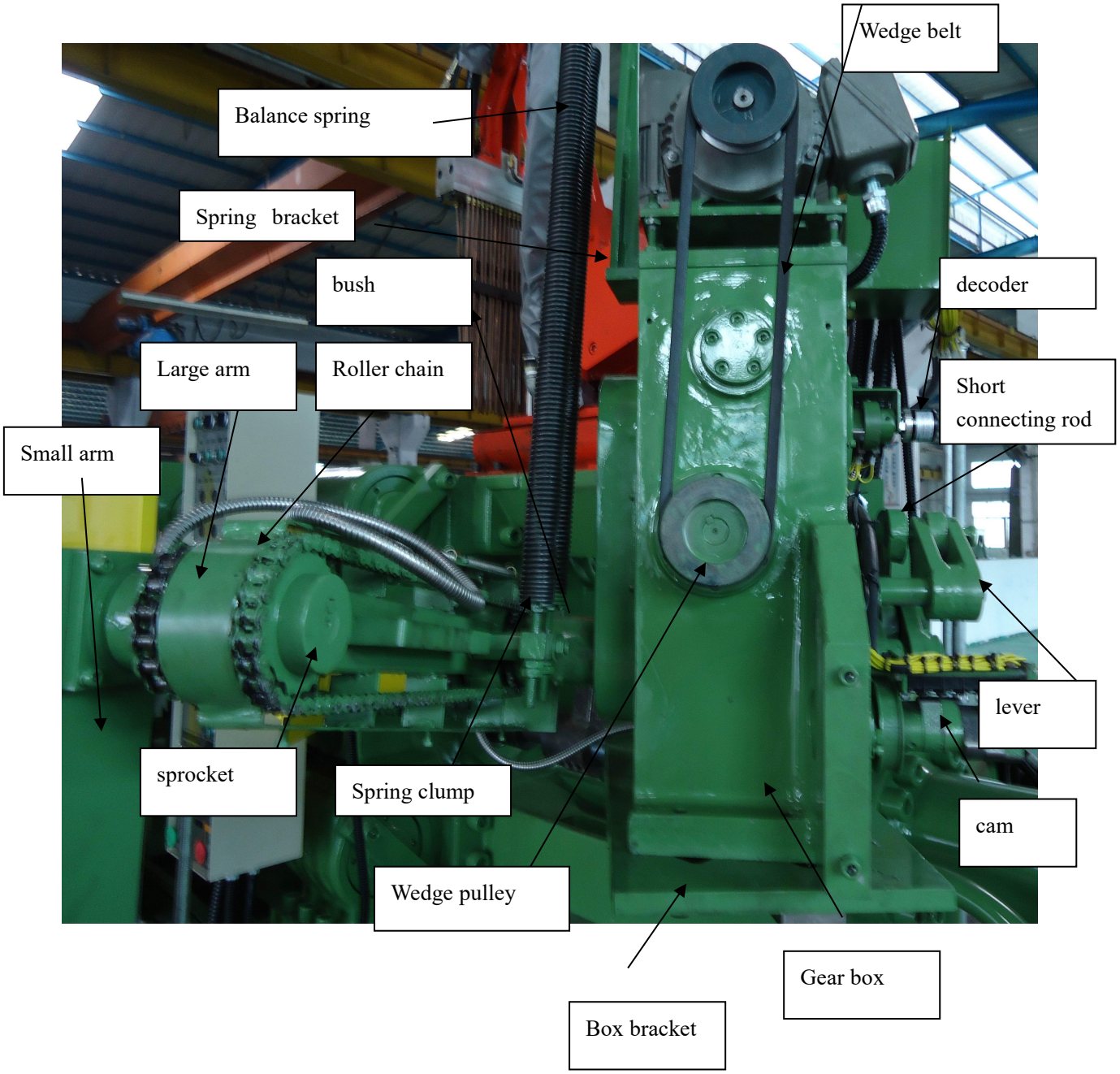




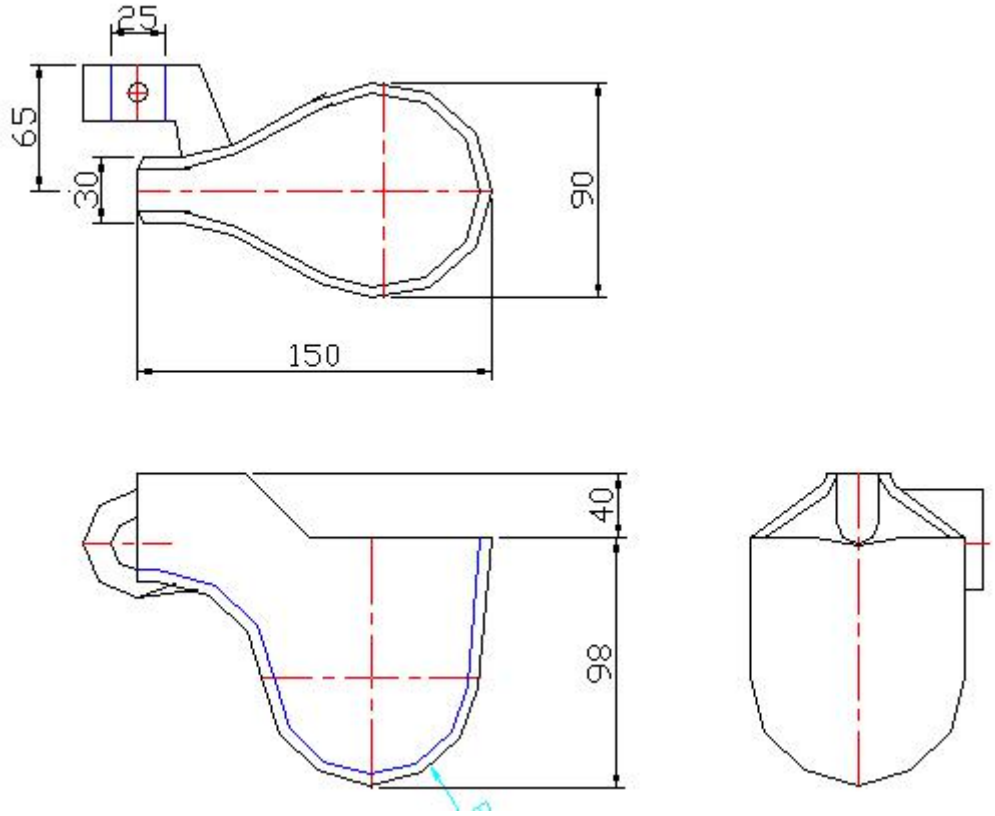
Worm reducing gear assembly drawing



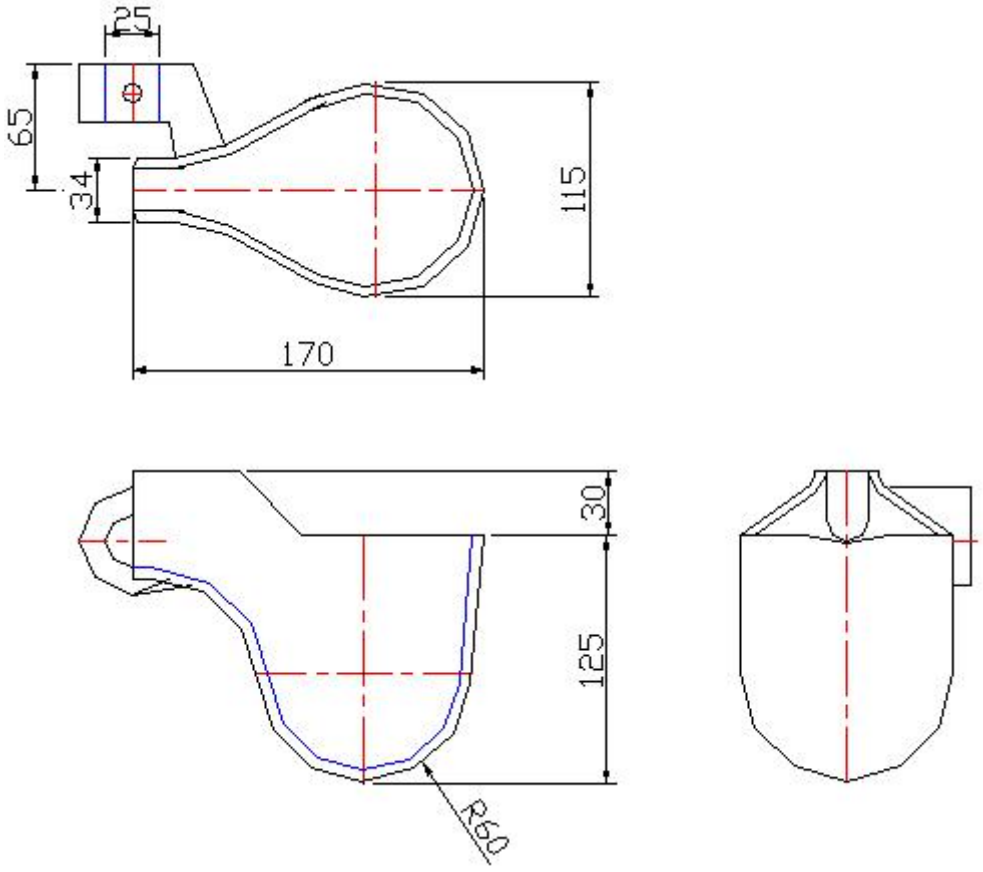
Moving Part assembly



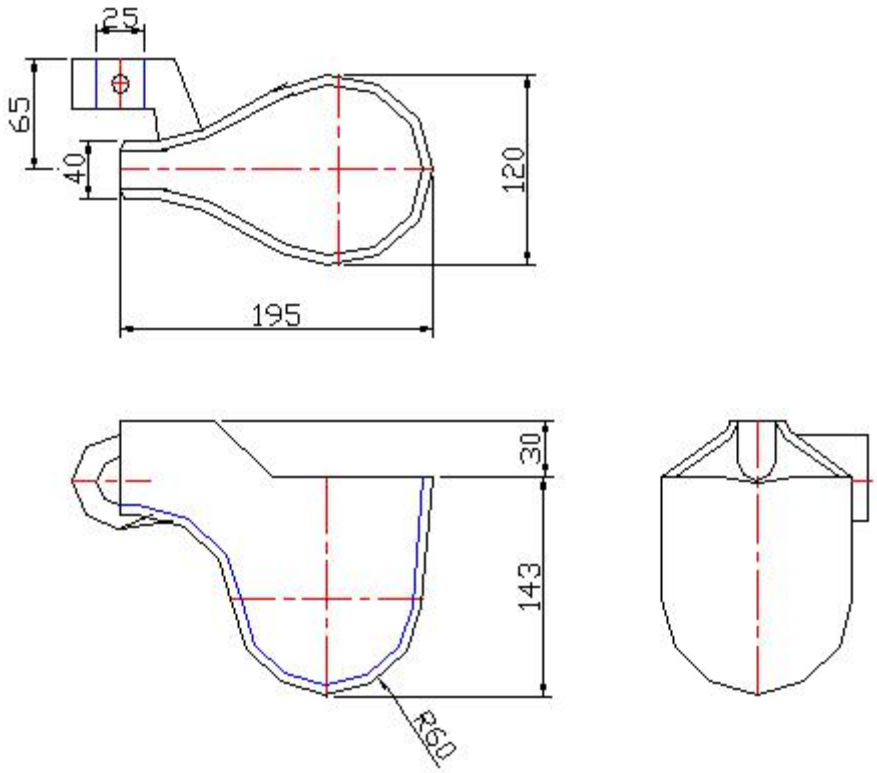
Ladle 0.8 料勺： 0.8KG



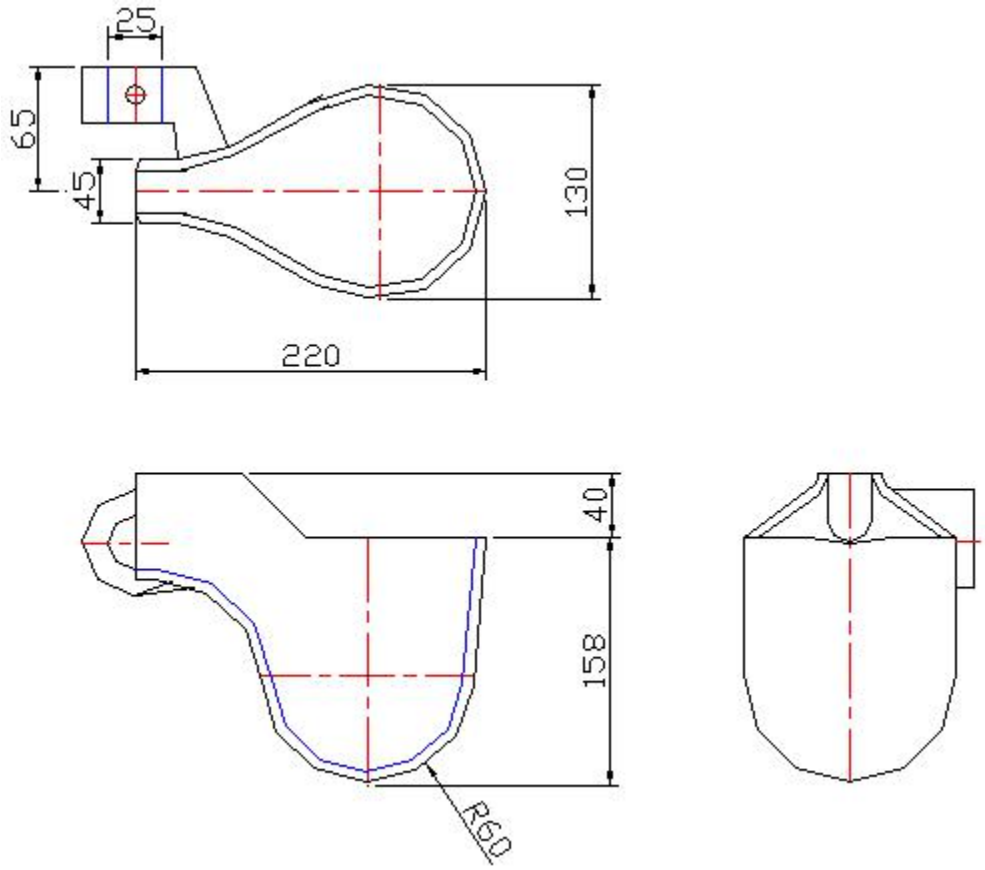
Ladle 1.6 料勺：1.6KG



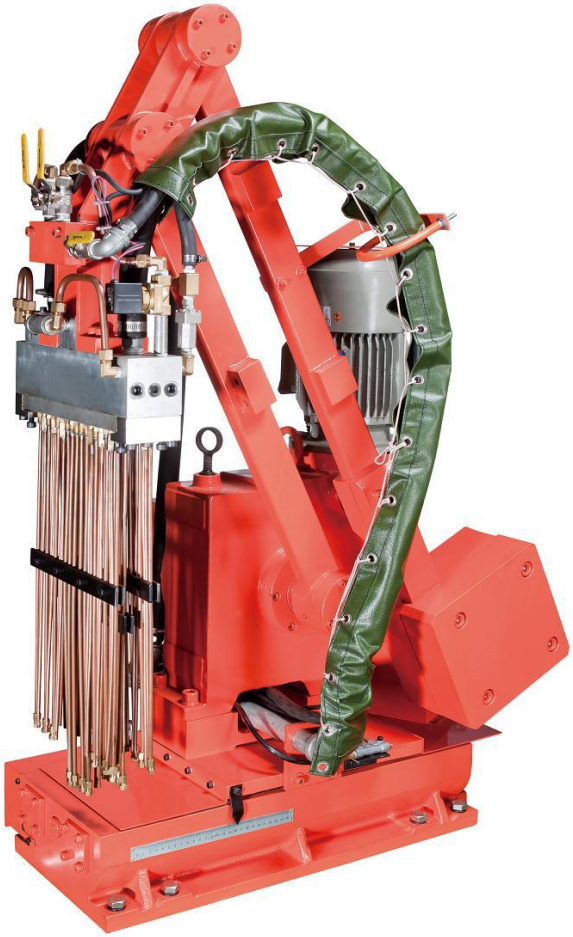
Ladle 2.5 料勺：2.5KG



Ladle 3.5 料勺：3.5KG



AUTO SPRAY



SAFETY INSTRUCTIONS AND PRECAUTIONS

1. Thoroughly read this Instruction Book and accompanying operation manual before installing, operating or servicing EVERGREAT machine.

2. EVERGREAT machines are highly technological and sophisticated. Only skilled persons having the requisite level knowledge and competence are to be entitled to instal ,operate ,or service EVERGREAT machine.

3. Always follow all of the instructions given in this instruction book ,accompanying operation manual whenever engaged to install operate or service the machine of "EVERGREAT".

4. Always wear safety glasses when installing operating or servicing EVERGREAT machine to protect your eyes from flying materials.

AUTO SPRAY

SPV-42

C O N T E N T S

1. Profile.

This unit installed on DC-250/DC-420 V3 OR V4N die casting machine for the duty of automatic spraying performance. For this unit, the water soluble release agent to be used. The oily agent should not be used for a danger of catching fire.

2. Main particulars.

1) Applicable to

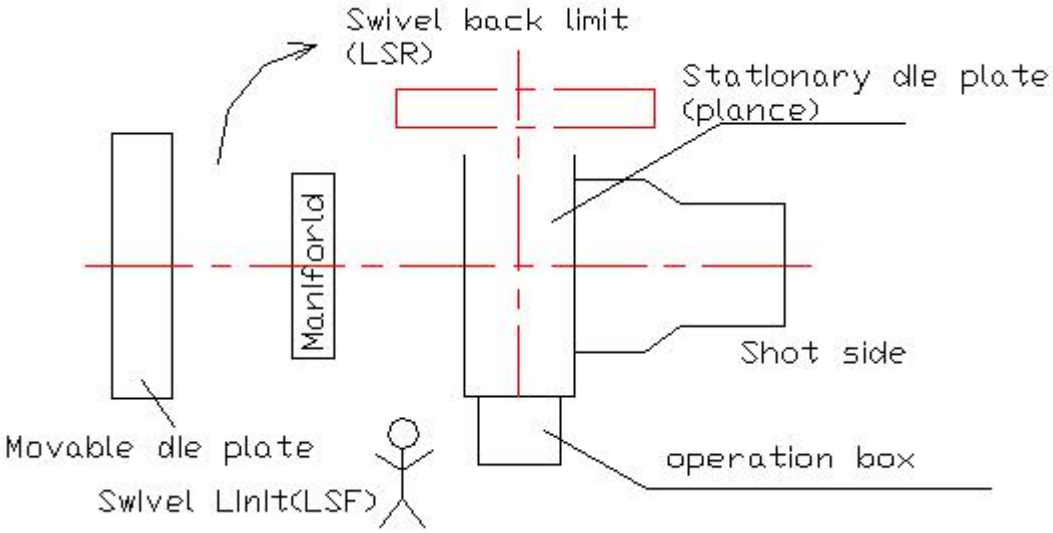
•SPV-42 : DC-250V3C/DC-420V3C,DC-250V4N/DC-420V4N

2) Up/down stroke	: 750 mm
3) Swivel angle	: NIL
4) Back & forth adjustment stroke :	200 mm
5) Spray pipe	: 62 pieces (31×2)
6) Air blow pipe	: 20 pieces
7) Net weight	: 150 kg

3. Spray performance.

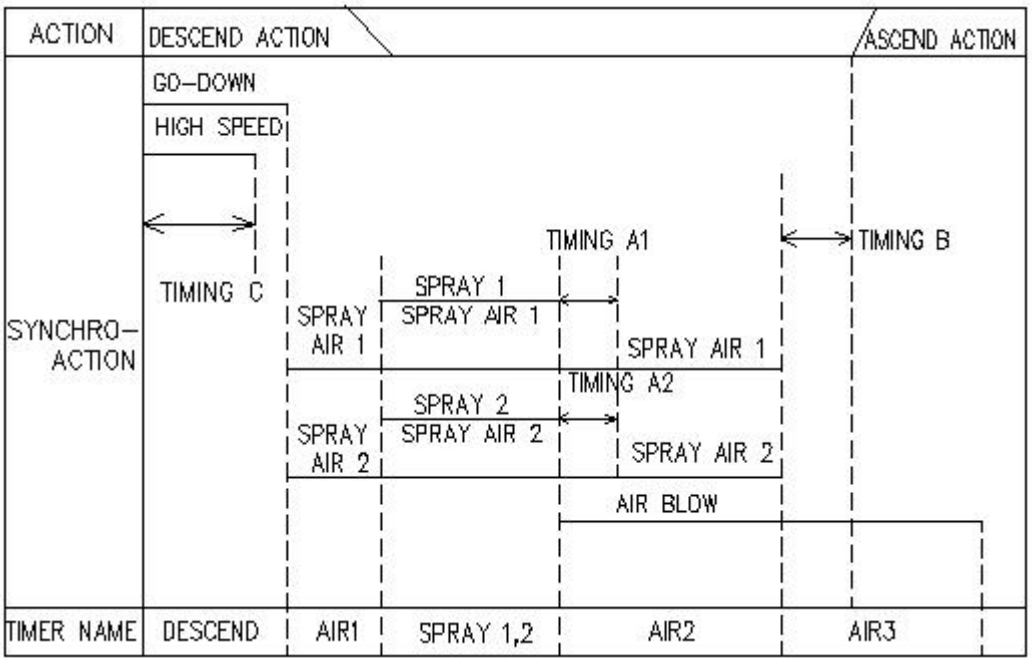
1) Swivel and swivel back.

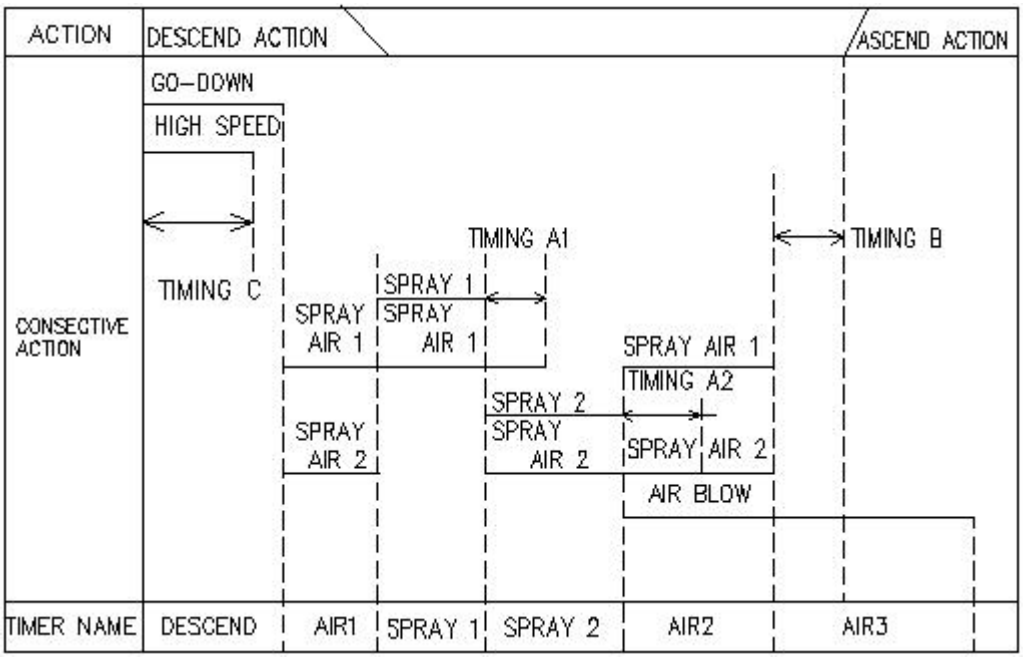
1) Swivel and swivel back.



If the die with hydraulic core is used, it may interfere with the automatic spray during die closing. In this case, turn on the snap switch that the die may start closing after the spray is fully retracted.

2) Spray pattern (standard) :





• When “go-down timer” timed up, “spray air 1, 2” will start.
• “Air 1” time to be set by “spray air 1, 2”.
• “Spray time” to be set by “spray 1, 2 timer”.
• “Air blow” time to be set by “Air 2 timer”.
• “Go-up air blow time” to be set by “Air 3 timer”.
• The above “time” can be set on the < SPRAY> screen of PLCS at discretion.
• The timing “A”, “B” and “C” can be altered on the <FIXED DATA 2> screen.
As to the details, refer to the operation manual

3). Control of spray time.
The spray time can be controlled by “cycle number” or by “die temperature”.
As to the details, refer to the operation manual.

4. Primary side piping.

1) Air piping.
The air connection mouth of the spray unit is 1 B size. For primary side air piping, prepare the pipe of 1 B size or bigger, and the air of 0.4MPa or bigger. Also, install the air filter (accessory) on the mid way of piping.

2) Liquid piping.
For the pressured “transfer” of release agent, the “auto dilute transfer system” is recommendable. If not AD system used, it is necessary to dispose of the waste liquid. The liquid pressure is set at 0.3～0.5 MPa range, and to be adjusted along with the spray air pressure to gain the best condition of spraying.

3) Connection of each piping.
The connection of each hose to be connected to the hose connection of under the swivel cylinder bracket that is located behind the spray unit.

* On the passage of air connection, the air filter (accessory) to be installed.

5. Adjustment

1) Back-and-Forth position of spray unit.
Loosen the locking bolt ①,and turn around the hand wheel ② clockwise.
Then the spray unit advances toward the movable die plate side.
If the hand wheel ② is turned around counter-clockwise, then, the spray unit moves backward to the stationary die plate side.
When the position is determined tighten up the locking bolt ① firmly.

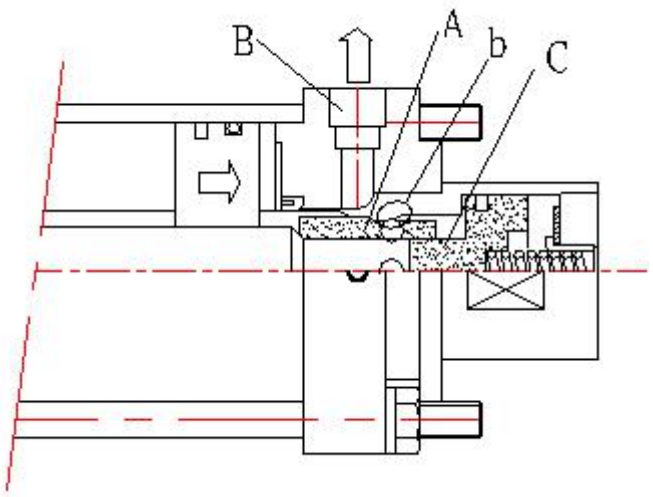
2) Adjustment of Up-Down stroke.
To get shouter stroke than particular it, loosen the stopper bolt ③ and lower its position. After lowered, adjust the height of both stoppers, right and left, to be on the same level.
In the case of short stroke, a shock may occur at the spray descending.

3) Adjustment of the shock absorber.
At the both ends of swiveling stroke, there provided the shock absorbers.
If there is any shock when the swiveling speed is changed, then adjust these absorbers .

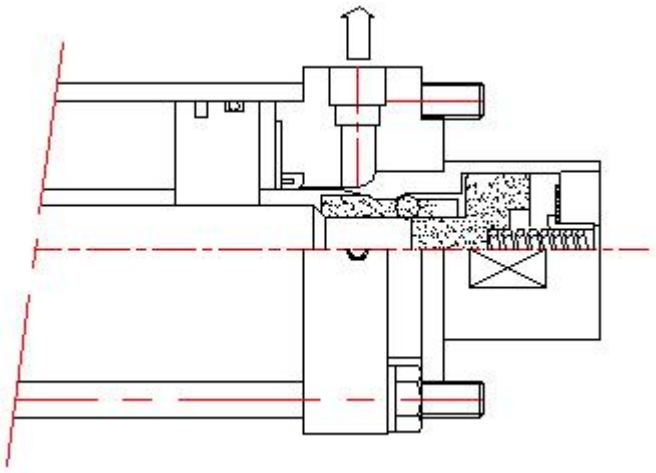
4) Adjustment of "swiveling" speed.

Adjust the "swiveling" speed by the controller (bottom sketch).
Set the controller in such a manner that no shock is noted when the spray moves swiveling .The controller ⓒ is for adjustment of "swiveling" speed, and ⓓ for "swiveling-back" speed.

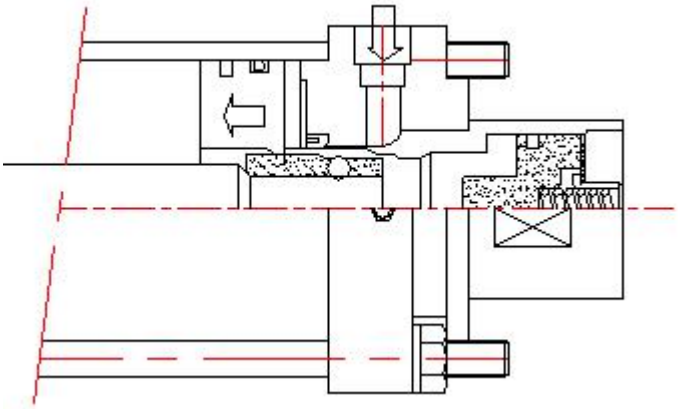
5）Mechanism of Top and Bottom cylinder lock
When the cylinder piston approached the stroke end (head side), the ball retainer a pushes the tip end of locking piston via the steel ball.



Further, when the piston approached the stroke end, and when the steel ball came to the tapered portion ⓑ of the body, then the steel ball will be pushed up by ⓒ and expand to outside.
Simultaneously, the locking piston will be pushed back by the spring, and ⓒ will slide into the ball retainer. Thus, the system will be locked up.



Next, when the pressure was given to the port ⓑ, the locking piston will push back the spring and will go forward to the right direction. Since the steel ball is now free and can move freely in the ball retainer, the lock will be released.



Adjustment of flowing amount and condition of release agent

① There are 4 methods for adjustment
A) If open-degree of mixing atomizer is made larger, the liquid amount increases
B) If spray timer is set “longer”, the liquid amount increases.
C) If liquid pressure made “large”, the liquid amount increases.
D) If spray-air pressure made “small”, the liquid amount increases.
② Adjustment of flowing condition of spray liquid
A) If liquid pressure is release-agent is lowered, “foggy” condition becomes more misty.
B) If spray-air pressure is raised, the “foggy” condition becomes more misty.

C) If open-degree of mixing atomizer made “small”, the “foggy” condition becomes more misty.

Note 1) In this case, spray liquid amount is reduced, set the spray-timer “longer”, and refill the liquid.

Note 2) Adjustment explained above is good for casting of “thin-wall”, “small-product”, and Zn products.

③ Spreading of “spray liquid”

Spread-area is about 25mm in diameter at the point of 50mm from nozzle tip-end. And, the most dense part of liquid is about 15mm in diameter. (in the case of “copper tube straight”).

6. Operation (Refer to chapter 9, 9-1 <Operation Panel>.)

(As to SPV-42 refer to the operation manual.)

1) Manual operation

(1) Turn on “operation power source” key switch that is on operation panel of die casting machine.

(2) Set the “Auto-manual” selection switch at the “manual”.

Caution

Under the condition that the swiveling ON-OFF switch is ON, and the rising-descending selection switch is at rising position, if the operation switch is set at “Manual” position, the spray will make a swiveling motion beyond the dies area of the die casting machine.

(3) Spray rising, descending

The spray rising and descending are controlled by the selection switch .

(4) Swiveling

If the “Swivel ON-OFF Selection switch” is set at “OFF” position, then the spray unit will swivel to the dies side of die casting machine (Spray descending position). Contrary, if it is at “ON” position, then the unit will swivel to the outside the dies (rear operation side).

(5) The air blow and the spray are controlled by the push button switch PB3 and PB1 respectively.

Caution

The spray descending will start at the die opening completion of die casting machine. The spray does not descend unless the die opening is completed.

Likewise, if the die opening is not completed, the spray will not start swiveling toward the die side.

2) Automatic operation(SPV-42)

(1) "Rise-Descend" selection switch (SSD) to be at "Rise".
The "Manual-Auto" selection switch (CSA) of the die casting machine to be set at "Auto".
The "Manual-Auto" selection switch (SS1) of the spray unit to be set at "Auto". Push "Spray Start" pushbutton switch (PBSA).

(2) At the spray start signal coming from the die casting machine, the "spray start timer" TD will start , and when TD has timed up, the air blow (1) will start.
At the time-up of T1, the air blow (1) will complete, and the spray (1) (2)will start .

(3) When the spray is completed the air blow (2) will start. The time length of the air blow (2) is controlled by the timer "air blow (2) "T3.

(4) If the air blow "rising-descending-bottom rising" switch SS3 is set at the "rising", the air blow will start at the same time of "rising" after completion of spraying. The time length of air blow will last for the duration whichever shorter period set by the timers T4 and T3. If set at "bottom", the air blow will start at the completion of spraying, and , when the timer T4 has timed up , the spray unit will ascend. The time of air blow will be for the duration set by the timer T4 .If set at the "bottom · rising" the spraying will complete when the air blow timer T4 has timed up, and the spray unit will ascend .The time length of the air blow will last for the duration set by the timers T4+ T3 . Namely, the "ascending · air blow" will last for the duration set by the timer T3.

3) Caution during auto operation

(1) In case if the spray unit touches the hydraulic core in the ascended area withing the dies during the die closing operation of die casting operation, then the "swivel back-swiveling" switch SS2 must be set at "swiveling" side. If the operation is kept going with the switch being at "OFF" position, then the spray unit will be damaged.

(2) If the unit swivels even though it is not in the "spray ascending limit", or the die casting machine performs the die closing operation, then it is suspicious that something is wrong with the "ascending limit switch" LSUP. Check and replace if necessary. ("Ascending switch" is shown in Drawing No.1).

(3) Unless the "ascending · descending" selection switch SSD is at ascending position the auto operation can not be performed.

7. Check of interlock (safety) circuit

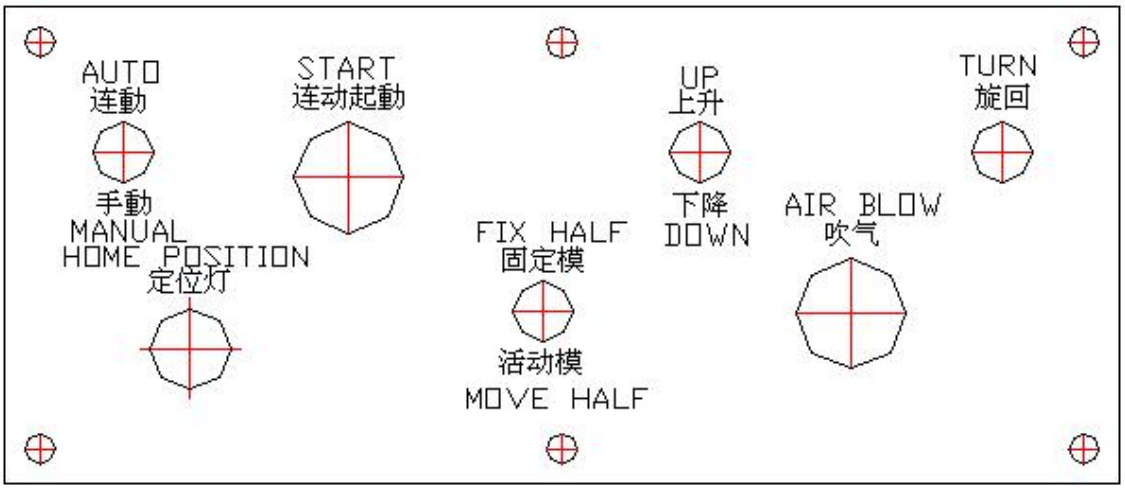
Check point for interlock (safety) circuit between the die casting machine and the auto spray unit.

1) First confirm by manual operation that spray does not descend under the condition that die casting machine is in the die locking condition.
   Only when the die casting machine is in the die opening completion status, the spray descends. It is abnormal if the spray descends even when the die casting machine is in the die locking status.

2) The die casting machine is operated for die opening, and the spray is descended by hand. Under this condition, the die casting machine manual die open/close selection switch is set at “close”, and the both hands pushbutton switch is pressed down. After having done there operations, confirm that the die locking operation does not take place.
   It is abnormal if the die locking movement takes place even though the spray is between the die halves. In this case, immediately release the push button switch, letting the machine stop instantly.

   In order to secure the safety of operation as well as the safety of the dies and automatic spray unit, be sure to carry out the above checking.
   If any abnormality found, suspend the automatic operation and contact us.

3) Abide by the stipulations in the “Caution when auto-operating” as stated under the item).



8. CONTROL PANEL、PARTS LIST

記號 （Mark）	品名 (Name)	形式 (Type)	メーカ (Maker)	個數 (Quantity)
PL-12	表示燈 (Display unit)	AH165-ZOH1	フヅデソキ (Fuji)	01
SS1.SSS SS4	スナップスイッチ (Snap S.W)	A J -311200	マツッタ （Matsushita）	03
SS2.SSD	スナップスイッチ (Snap S.W)	A J -311100	マツッタ （Matsushita）	02
PB1. PB2 PB3. PBSA	オツポタンＳW (Push –button S.W)	SB-61A(クロ） (Black)	ニッカイ (Nikkai)	04

9. Function and duty of limit switches

1) LSUP: This switch is “ON” when the spray rises to its upper limit.
   : Unless LSUP is “ON”, the swiveling motion and the die casting machine die closing motion will not take place. The extractor does not advance either.
2) LSTUN0: This switch is “ON” at the swiveling end (the spray descended position).
   Unless LSTUN0 is “ON” at the swiveling end, the spray does not descend.
3) LSTUN90: This switch is “ON” at the swiveling back (swivels toward the rear operation side).
   Unless LSTUN90 is “ON” when the unit swivels back , the die casting machine does not function the die opening nor die closing.

10. Maintenance inspection

Item	Description	Time and treatment
Limit switches	ON-OFF Function is normal or not . No looseness of fitting parts?	Daily
Filter	Drain is discharged	Daily(check auto drain)
Fitting bolts	Looseness of fitting bolts of spray body	Daily
Friction part	Lubrication of grease nipple fitting part	Once a month (replenish the grease)
Air cylinder	Pins of jointing part never slide out of positions. Bolts of jointing part never get loosened. Piping hose never gets loosened. Air not leaking.	Daily
Interlocking circuit		Daily
Bolts and nuts	Not to be loosened	Once a week
Air pressure	Pressure must be 0.4MPa/c ㎡	Daily

11. Troubleshooting

1) Spray does not go down.
 (1) Check if the power source lamp is lit on . (Check fuse.)
 (Is the die casting machine pump “ON” ?)
 (2) Check if the die opening completed?
 (3) Check if the extractor retract limit switch is pressed down.
 Adjust if necessary.
 (4) Check if the limit switch (LSTUN0) of spray swivel is pressed down.
 (5) Check if the speed controller of descending speed is throttled too much.
 Loosen the controller if necessary.
 (6) Check if the coils of solenoid valve not burnt.
 Replace if necessary.

2) Spray does not go up.
 (1) Check if air pressure is 0.4 MPa.
 (2) Check if the speed controller is not over-throttled.
 (3) Check if any objects interrupting the automatic spray.
 (4) Abnormality of solenoid valve.
 Replace if necessary.

3) Spraying liquid not coming out.
 (1) Is the air coming out of nozzle? (Check the air piping of solenoid valve.)
 (2) Isn’t the delivery throttle valve of nozzle tightened up too much?
 Open if necessary.
 (3) Isn’t the setting time of spraying too short?
 Adjust the spraying time.
 (4) Isn’t the hose of release agent pipe broken?
 Replace if necessary.
 (5) Isn’t the release agent tank empty?
 Refill if necessary.
 (6) Isn’t the spray nozzle clogged?
 Clean if necessary.

4) The unit does not swivel.
 (1) Is the swivel ON-OFF selector switch “ON”?
 (2) Is the air pressure normal? 0.4MPa
 (3) Isn’t the speed controller throttled too tight?
 Loosen if necessary.
 (4) Is LSUP limit switch press down?
 Adjust if necessary.

12. List of Accessory

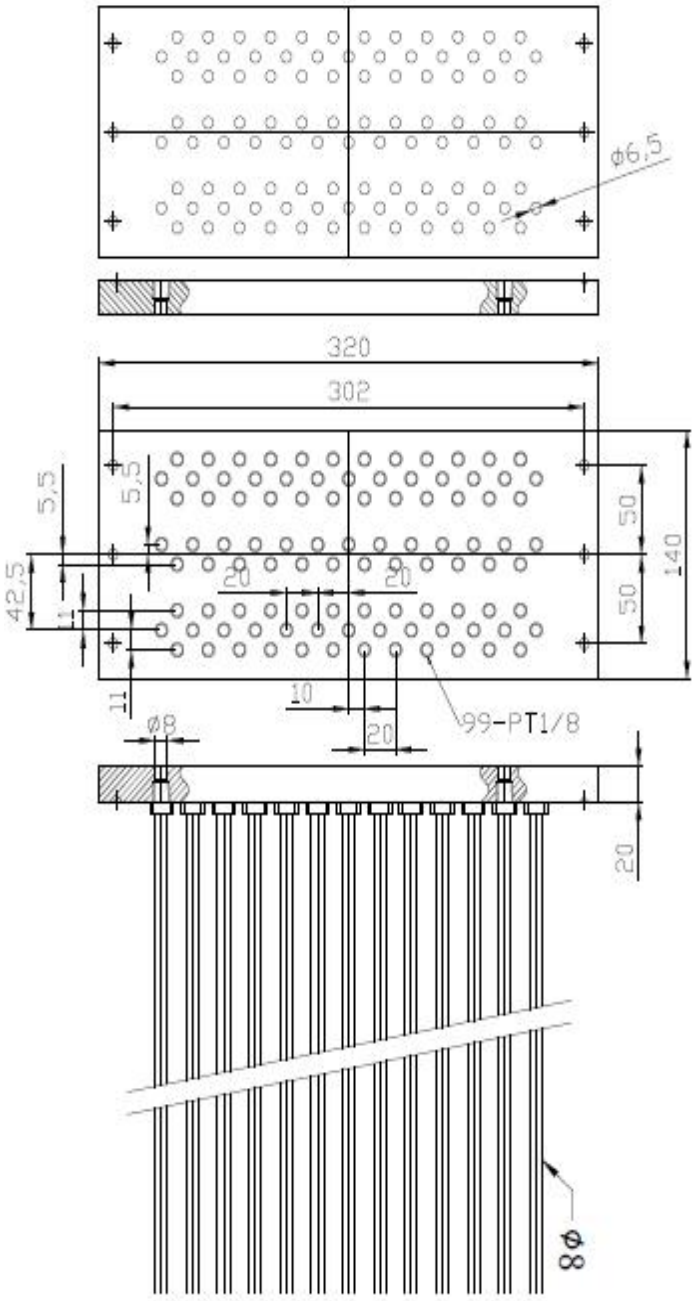
	Name	Type Dimension	Q'TY	Remark
01	Air filter	F8000-25-F	01	Air piping
02	Air hose	25(1)×3M	01	
03	Wire clamp	Φ36	02	
04	Hose connection	C-type 1"	01	
05	Air hose	12(1/2")×6M	01	Piping
06	Wire clamp	Φ28	02	
07	Hose connection	C-type 1/2"	01	
08	Hexagonal head bolt	M12×40 ょ	04	Installation
09	Spring washer	M12	04	

13. Main Purchase Parts

	Name	Type Dimension	Maker	Remark
01	Shock absorber	AM10-25U	ASIC0	Swiveling
※ 0 2 P	V cylinder with end lock	CA1BN63-L5348-600[750]	S M C	Up/down
0 2 C	V cylinder with end lock	CA1BN63-L5347-600[750]	S M C	Up/down
※ 0 3 P	Air cylinder	CDVP1DN40[50]-01-66983[68147]	S M C	Swiveling
0 3 C	Air cylinder	CDVP1DN40[50]-01-47751[47752]	S M C	Swiveling
※ 0 4 P	Solenoid valve	VXZ2230-03-5DZ	S M C	High-speed down-speed
0 4 C	Solenoid valve	VXZ2230-03-1DZ	S M C	High-speed down-speed
※ 0 5 P	Solenoid valve	VF3130-5GS-01	S M C	For atomizer changing
0 5 C	Solenoid valve	VF3130-1GS-01	S M C	For atomizer changing
※ 0 6 P	Solenoid valve	VXD2140-04-5GS	S M C	Air blow
0 6 C	Solenoid valve	VXD2140-04-1GS	S M C	Air blow
※ 0 7 P	Solenoid valve	VXD2150-06-5GS	S M C	Spray air
0 7 C	Solenoid valve	VXD2150-06-1GS	S M C	Spray air
0 8	Mixing atomizer	GRSH-40	HANAN0	
0 9	Air filter	F8000-25-F	C K D	Air
1 0	Y-type strainer	SY-6-25A(50mesh)	YOSHITAKE	Liquid
1 1	Air regulator	AR3000-03	S M C	CYL circuit

1 2	Air regulator	2303-6C	C K D	Spray air　Air blow
1 3	Limit switch	WLCA2	OMRON	Upper limit　LSU
1 4	Auto switch	D-A-59	S M C	Swiveling　end LSF
1 5	Auto switch	D-A-59	S M C	Swiveling　end LSR
1 6	Pressure gauge	G36-10-01	S M C	CYL circuit
1 7	Pressure gauge	G59D-8 PK10	C K D	Spray air,　Air blow
※ 1 8 P	Solenoid valve	VF5220-5GS-03-X10	S M C	Up/Down
1 8 C	Solenoid valve	VF5220-1G-03-X10	S M C	Up/Down
※ 1 9 P	Solenoid valve	VP4224A-025GS-X52	S M C	Swiveling
1 9 C	Solenoid valve	VP4224A-021G-X52	S M C	Swiveling

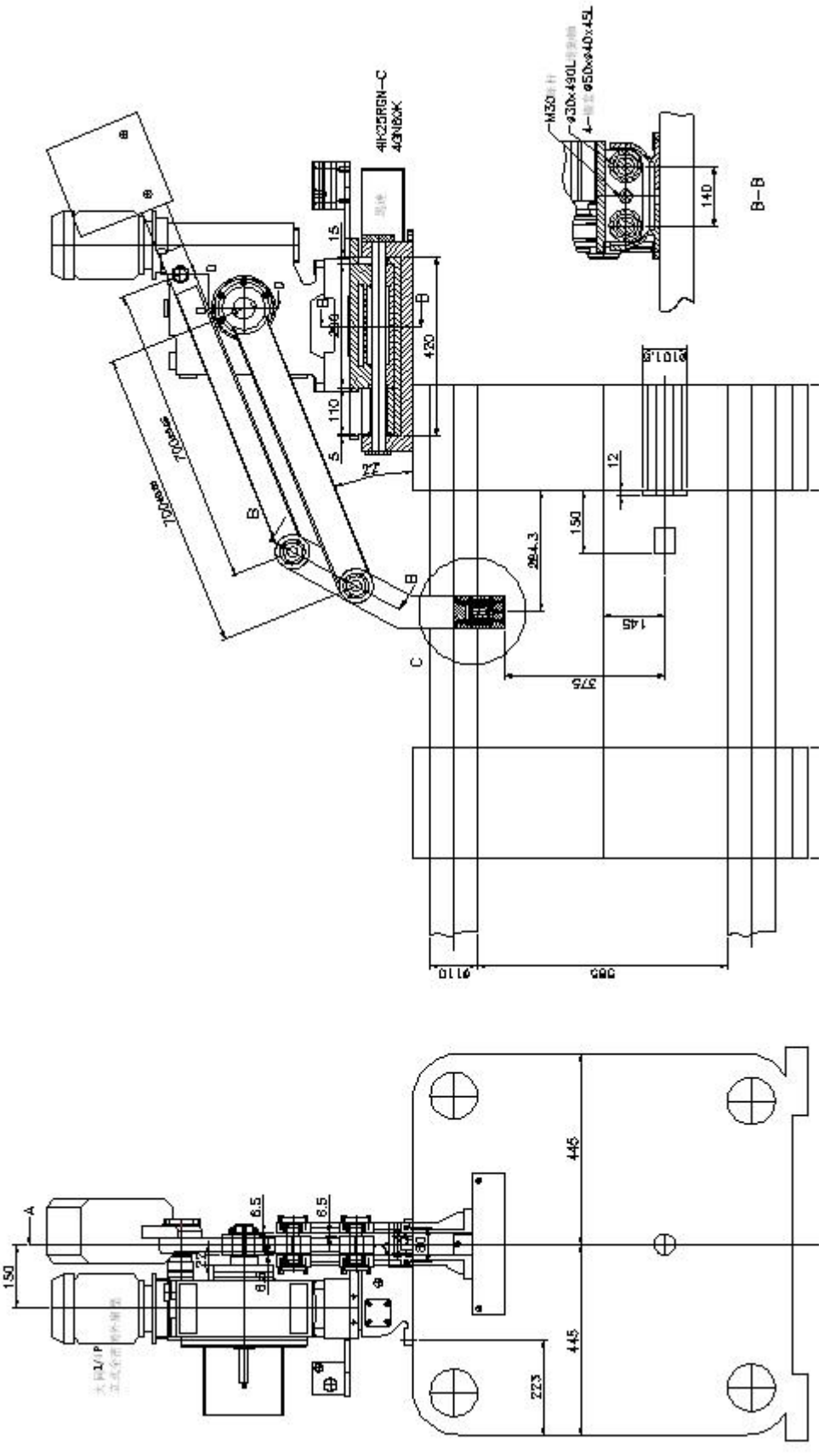
銅管， 噴霧頭



（Mixing atomizer） :GRSH-80 (×8)

銅管 （Spray nozzle）: 99 根(pieces)

SPV 噴霧機




Spray Press Adj
Spray Sol
Blow Sol
Auto Spray
Blow Sol

650給湯+噴霧 油壓伺服 I/O Table

I/O	English Code	中文說明	I/O	English Code	中文說明	I/O	English Code	中文說明
X0	SIN A	A相	X66		控制器準備完成	Y24	S'AIRBLO	料管吹氣
X1	SIN B	B相	X67	Motor O.L.	馬達過載	Y25	S'BOOST	增壓閥
X2	CUP SIN A	給湯機湯量	X70		射出低速SW	Y26		
X3			X71		高速增壓SW	Y27	STACC	蓄壓器填充閥
X4			X72	Oil Leve1	油量低限	Y30	MCLF	手臂前進
X5			X73	SW INJF	射進	Y31	MCLR	手臂後退
X6	SW ER	押退	X74	SW INJR	射退	Y32	LC1F	手臂1速
X7	SW CIF1	中子1入	X75	LS LUBE	曲手潤滑低限	Y33	LC2F	手臂2速
X10	SW CIR1	中子1出	X76	LUBE P.S	曲手潤滑壓力	Y34	MCPF	注湯
X11	PB TOG1	曲手啟動1	X77	DOOR	安全門機台	Y35	MCPR	汲湯
X12	PB INJ	射出啟動	X100			Y36	PCF1	料勺1速
X13	INCHF	寸進	X101			Y37	PCF2	料勺2速
X14	LSCIF1	中子1入限	X102			Y40	S'DO	開模閥
X15	LSCIR1	中子1出限	X103	PB STRT	噴霧機啟動	Y41	S'DC	關模閥
X16	LSO	型開限	X104	SP AUTO	噴霧機自/手動	Y42	S'DCHS	關模高速閥
X17	LSOS	型開減速限	X105	SW SP UP	噴霧機上升	Y43	LUBE	曲手潤滑
X20	LSCS	型閉減速	X106	SW SP DN	噴霧機下降	Y44	MRS	油壓馬達啟動
X21	PB TOG2	曲手啟動2	X107	PB SPR	固定模噴霧	Y45	S'DSF	型開減速閥
X22	LSEB	押退限	X110	PB BLO	吹氣	Y46	BREAK	手臂煞車
X23	LSEF	押出限	X111	LS UP	上升限	Y47	BREAK	湯杓煞車
X24	LSIB	射退限	X112	LS DN	下降限	Y50		
X25	SW DC	關模	X113	LS UP SLOW	上升減速限	Y51		
X26	SW EF	押出	X114	LS DN SLOW	下降減速限	Y52	SPR BREAK	噴霧機離合器
X27	LSC	型閉限	X115	PB SPR MOV	活動模噴霧	Y53	S'BLO	噴霧機吹氣閥
X30	PB STOP	緊急停止	X116			Y54	S'SPR1	噴霧機動模閥
X31	ACC1	ACC1壓力上限	X117			Y55	S'SPR2	閥
X32			X120	SW CIF2	中子2入	Y56	L'AL STRT	給湯機啟動燈
X33	INCHR	寸退	X121	SW CIR2	中子2出	Y57		
X34	SW ADJF	調模進	X122	SW CIF3	中子3入	Y60	L'SP HOME	噴霧機定位燈
X35	SW ADJR	調模退	X123	SW CIR3	中子3出	Y61	S'SF2	二次慢進
X36	PB PUMP	幫浦啟动	X124	LSCIF2	中子2入限	Y62	L'SP STRT	噴霧機啟動燈
X37	LSSD	給湯機安全門	X125	LSCIR2	中子2出限	Y63	L'LOCK	型閉確定燈
X40	AL AUTO	給湯機自/手動	X126	LSCIF3	中子3入限	Y64		
X41	AL STRT	給湯機啟動	X127	LSCIR3	中子3出限	Y65	S'SP1 MOV	活動模噴霧
X42	SW M/C AUTO	手/自動	Y0			Y66	S'SP2 FIX	固定模噴霧
X43	SW DO	開模	Y1			Y67		
X44	SW AL FWD	前進給湯機	Y2			Y70		
X45	SW AL RET	後退給湯機	Y3	S'EJE F	押出閥	Y71		
X46	SW PR	汲湯給湯機	Y4	S'EJR R	押退閥	Y72		
X47	SW PF	注湯給湯機	Y5	S'CIF1	中子1入	Y73		
X50	RB	斷線給湯機	Y6	S'CIR1	中子1出	Y74		
X51	LSR	手臂後退限	Y7	S/ADJF	調模進接觸器	Y75		
X52	LSRF	手臂後退減速	Y10			Y76		
X53	LSW	手臂後退待機位置	Y11	S'INJF	射進閥	Y77		
X54	LSFF	手臂前進減速	Y12	S'INJR	射退閥	Y100	M1 INC	增壓閥 增
X55	LSF	手臂前進限	Y13	S'SHOT	快射閥	Y101	M1 DEC	增壓閥 減
X56	LSF2	手臂前進安全限	Y14	SP DN	噴霧機下降	Y102	M2 INC	快射閥 增
X57			Y15	SP UP	噴霧機上升	Y103	M2 DEC	快射閥 減
X60	LSPF	湯杓注湯限	Y16	SP S1	噴霧機一速	Y104	S'CIF2	中子2入
X61	LSPH	湯杓水平限	Y17	SP S2	噴霧機二速	Y105	S'CIR2	中子2出
X62	FLS1	湯面檢出1	Y20	BZ	警報器	Y106	S'CIF3	中子3入
X63	INV OL	變頻器過載	Y21	S'ADJR	調模退接觸器	Y107	S'CIR3	中子3出
X64	LSPFF	注湯安全限	Y22	S'TIPLUB	料管潤滑			
X65	FLS2	湯面檢出2	Y23					

FX3UMT 650 給湯機+噴霧機 油壓伺服　外線表(一)

中子外線表

線號	名稱	I/O
1	押出閥	Y3A
2	押退閥	Y4A
3	中子入閥	Y5A
4	中子出閥	Y6A
5	開模閥	Y40A
6	關模閥	Y41A
7	關模高速閥	Y42A
8	曲手潤滑	Y43A
9	型開減速閥	Y45A
10	中子1入限	X14
11	中子1出限	X15
12	型開限	X16
13	型開減速	X17
14	型畢減速	X20
15	押退限	X22
16	押出限	X23
17	型閉限	X27
18	曲手潤滑低限	X75
19	曲手潤滑壓力	X76
20	電源供應器	0V
21	電源供應器	24VD
22	AC220V	12
23	AC220V	13
24	中子2入閥	Y104A
25	中子2出閥	Y105A
26	中子3入閥	Y106A
27	中子3出閥	Y107A
28	中子2入限	X124
29	中子2出限	X125
30	中子3入限	X126
31	中子3出限	X127
線料:0.75*30C		
線長:		
浪管尺寸:		
浪管長度:2.8米		

操作箱外線表

線號	名稱	I/O
1	射出指示燈	Y11
2	警報指示燈	Y20
3	料管潤滑	Y22
4	料管吹氣	Y24
5	型閉中	Y41
6	馬達起動燈	Y44
7	吹氣指示燈	Y53
8	給湯機起動燈	Y56
9	噴霧定位燈	Y60
10	噴霧起動燈	Y62
11	型閉確定燈	Y63
12	押退	X6
13	中子入	X7
14	中子出	X10
15	曲手起動1	X11
16	射出起動	X12
17	取手起動2	X21
18	關模	X25
19	押出	X26
20	緊急停止	X30
21	調模進	X34
22	調模退	X35
23	馬達起動燈	X36
24	給湯機安全門	X37
25	給湯機手自動	X40
26	給湯機起動	X41
27	手自動SW	X42
28	開模SW	X43
29	手臂前進	X44
30	手臂後退	X45
31	汲湯	X46
32	注湯	X47
33	射進SW	X73
34	射退SW	X74
35	噴霧起動	X103
36	噴霧手自動	X104
37	噴霧上升	X105
38	噴霧下降	X106
39	噴霧固定模	X107
40	吹氣	X110
41	噴霧活動模	X115
42	噴霧右移	38
43	噴霧左移	39
44	AC220V	12
45	電源供應器	0V
46	電源供應器	24VD
47	操作電源AC220V	5
48	操作電源AC220V	5A
49	射出低速	X70
50	高速增壓	X71
51	中子2入	X120
52	中子2出	X121
53	中子3入	X122
54	中子3出	X123
55	料管潤滑	Y22A
56	料管吹氣	Y24A
57	異常復歸	X32.8
線料:0.75*50C+0.75*10C		
線長:		
浪管尺寸:		
浪管長度:4.5米		

FX3UMT 650 給湯機+噴霧機 油壓伺服　外線表(二)

射出外線表20C

線號	名稱	I/O
1	射進閥	Y11A
2	射退閥	Y12A
3	快射閥	Y13A
4	料管潤滑	Y22A
5	料管吹氣	Y24A
6	增壓閥	Y25A
7	蓄壓器填充	Y27A
8	二次慢進	Y61A
9	射退限	X24
10	電源供應器	0V
11	電源供應器	24VD
12	AC220V	13
隔離線(不經過端子)4C		
綠	A相(綠)	X0
白	B相(白)	X1
紅	PLC(紅)	+24V
黑	PLC(藍)	0V
隔離線(不經過端子)10C		
	壓力感應器ACC1	78
	壓力感應射出	79
	壓力感應器ACC2	80
	快射閥開度電位計	82
	增壓閥開度電位計	83
	PLC	+24V
	PLC	0V
		+10V
線料:0.75*20C		
隔離線:0.5*4C		
隔離線:0.5*10C		
普線長:		
隔離線長:		
浪管尺寸:		
浪管長度:6米		

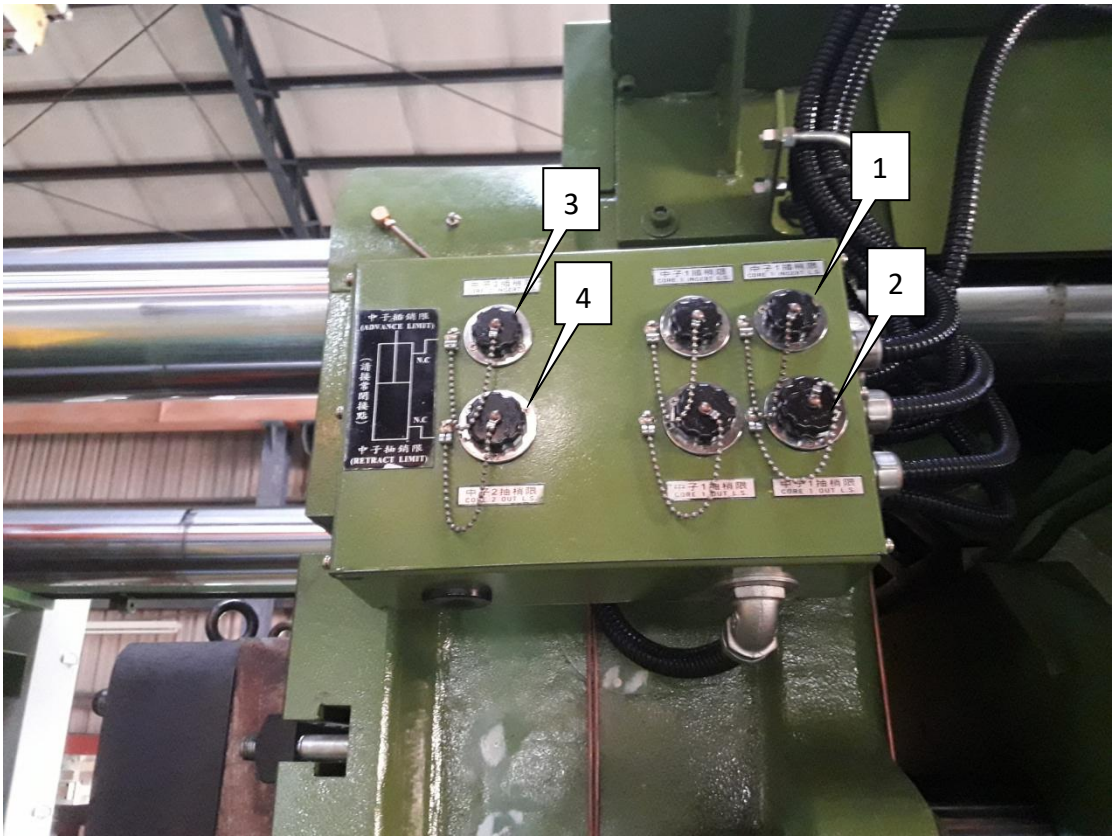
13	調模進	Y7A
14	調模進	Y7B
15	調模退	Y21A
16	調模退	Y21B
17	安全門	X77
18	安全門	0V
19	快射閥 增	Y102A
20	快射閥 減	Y103A
21	快射閥馬達剎車	229

給湯機外線表20(芯)C

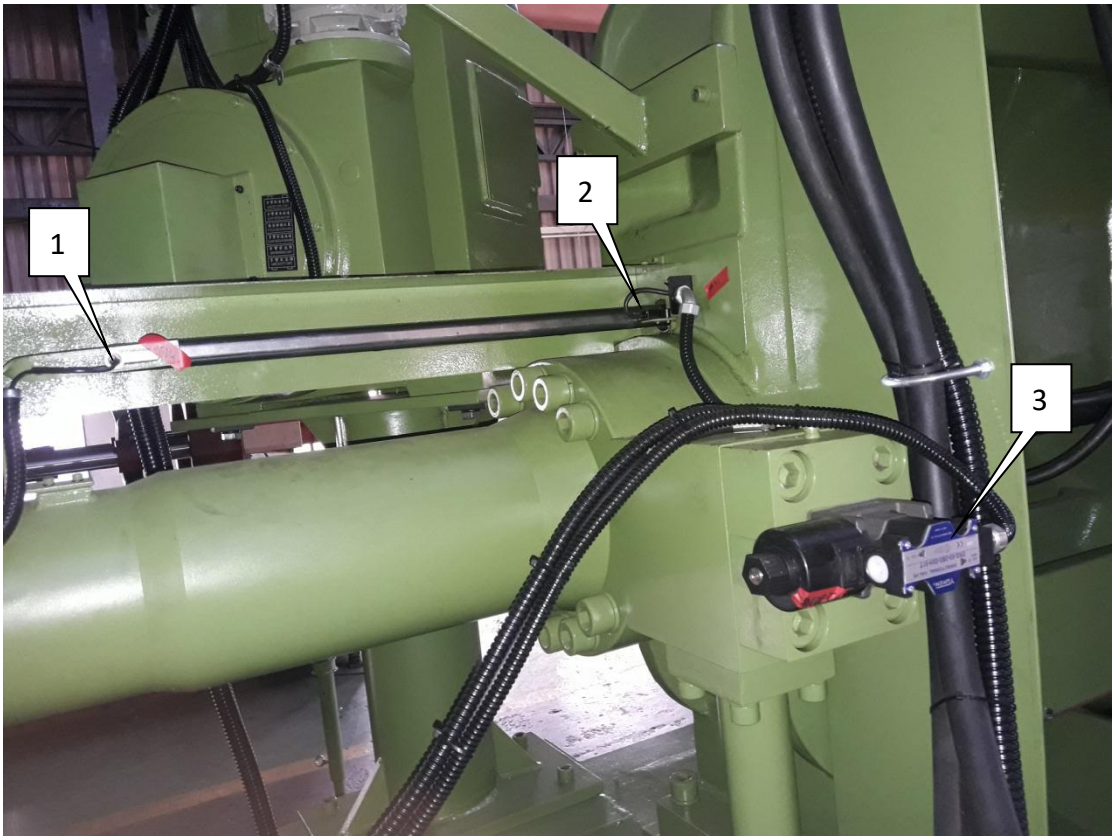
線號	名稱	I/O
1	後退限	X51
2	後退減速限	X52
3	後退待機位子	X53
4	前進減速	X54
5	前進限	X55
6	前進安全限	X56
7	注湯限	X60
8	水平限	X61
9	汲湯安全限	X64
10	深針線	8
11	深針線	9
12	深針線	10
13	深針線	11
14	電源供應器	0V
隔離線(不經過端子)4C		
紅	PLC	+24V
黑	PLC	0V
綠	湯量調整	X2
手臂馬達1.25*5(芯)C		
紅(1)		U1
白(2)		V1
黑(3)		W1
黃(4)		Y46A
綠(5)		13
湯勺馬達1.25*5C		
紅(1)		U2
白(2)		V2
黑(3)		W2
黃(4)		Y47A
綠(5)		13
線料:0.75*20C		
隔離線:0.5*4C		
馬達線:手臂1.25mm/勺0.75mm		
普+隔離線長:		
馬達線長:		
浪管尺寸:		
浪管長度:0.75米*2		

噴霧機外線表20C

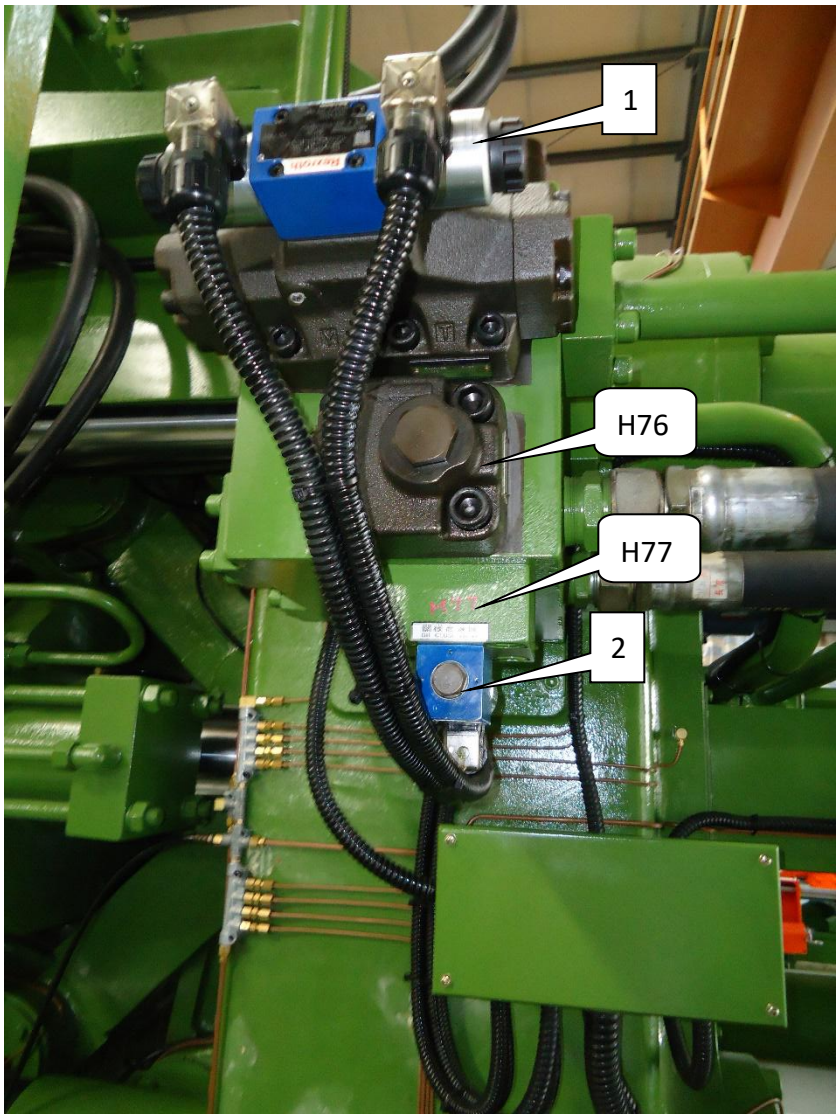
線號	名稱	I/O
1	吹氣閥	Y53A
2	噴霧活動模氣閥	Y54A
3	噴霧固定模氣閥	Y55A
4	活動模噴霧閥	Y65A
5	固定模噴霧閥	Y66A
6	上升限	X111
7	下降限	X112
8	上升減速	X113
9	下降減速	X114
10	右移電源	38
11	左移電源	39
12	電源供應器	0V
13	AC220V	13
噴霧機馬達1.25*5(芯)C		
紅(1)		U3
白(2)		V3
黑(3)		W3
黃(4)		Y52A
綠(5)		13
線料:0.75*20C		
馬達線:1.25*5C		
線長:		
普線浪管尺寸:		
馬達浪管尺寸:		
浪管長度:8米*2		



1.中子 1 入限插座　X14 0V　Core NO.1 IN limit sw socket
2.中子 1 出限插座　X10 0V　Core NO.1 OUT limit sw socket
3.中子 2 入限插座　X124 0V　Core NO.2 IN limit sw socket
4.中子 2 出限插座　X125 0V　Core NO.2 OUT limit sw socket

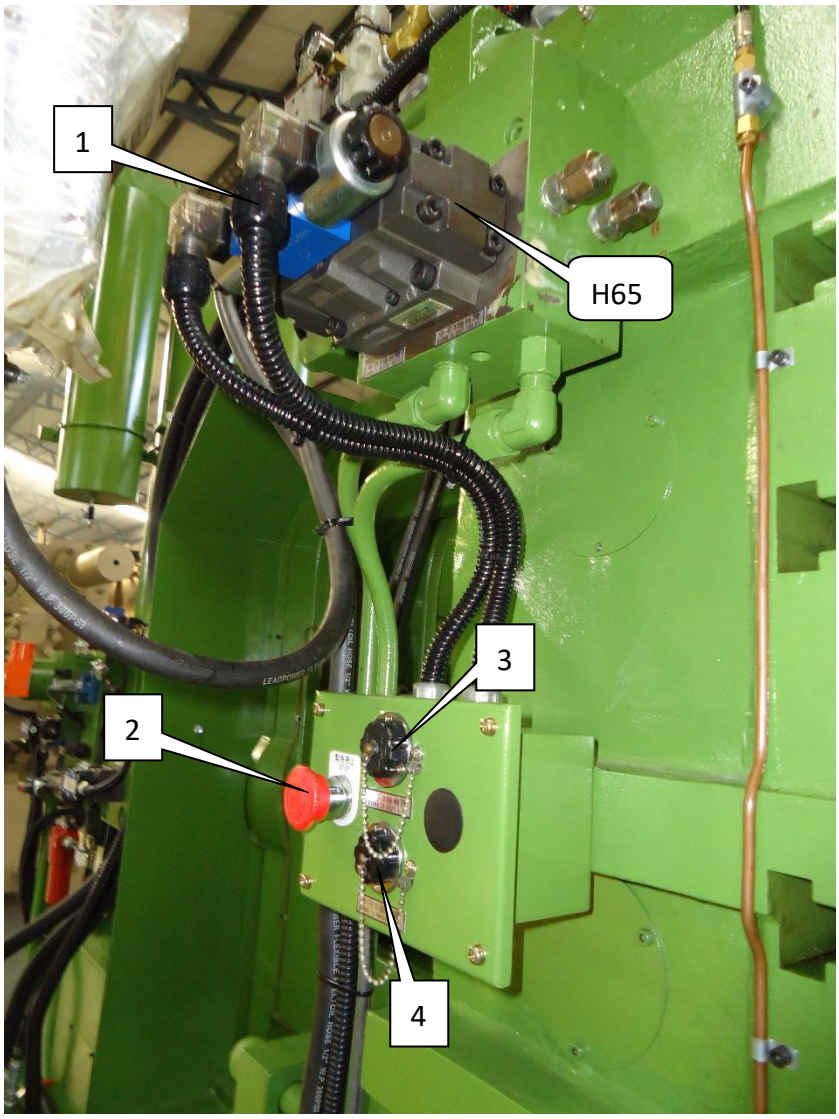


1.射退限近接開關　X24 24VD 0V　Injection Retract limit sw
2.射出行程譯碼器　X0 X1 24VD 0V　Injection strake sensor
3.射退電磁閥　Y12A 0V　Inject retract valve



1.開關模電磁閥　Y40A Y41A 0V (H15)　Die close/open valve

2.關模高速閥　Y42A 0V (H16)　Die close high speed valve

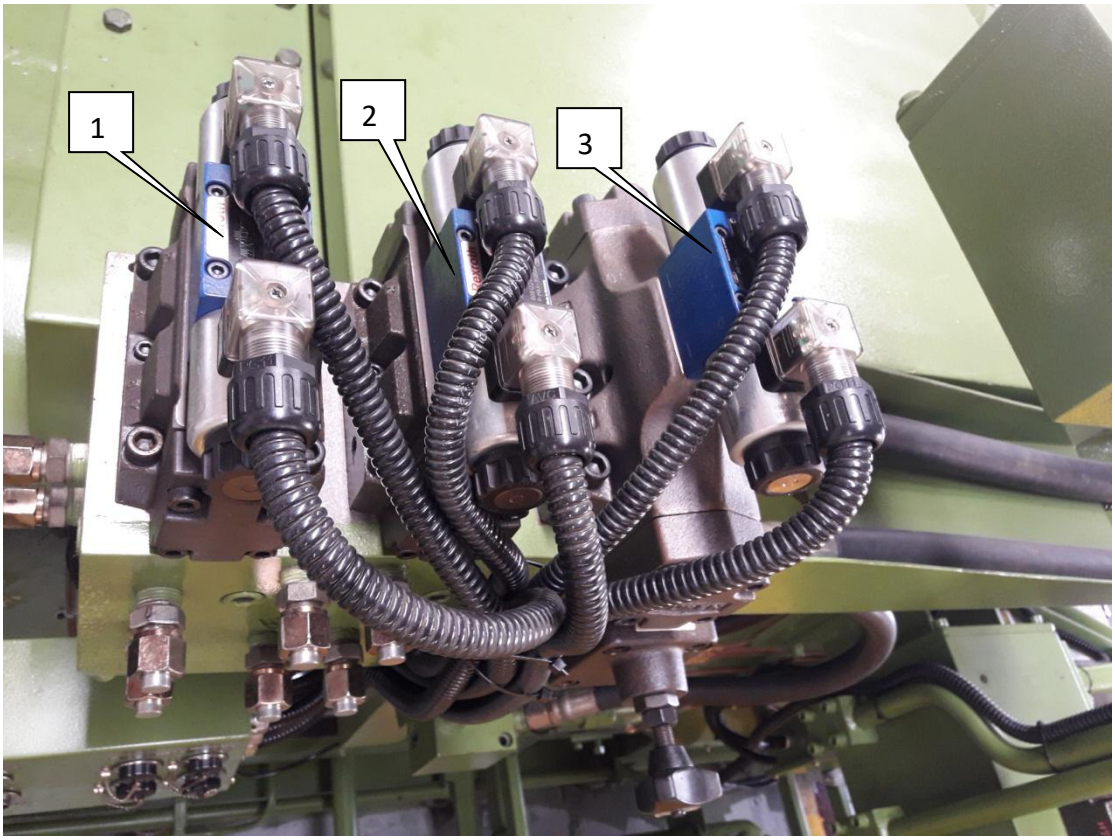


1.中子 3 電磁閥　Y106A Y107A 0V (H65)　Core NO.3 valve

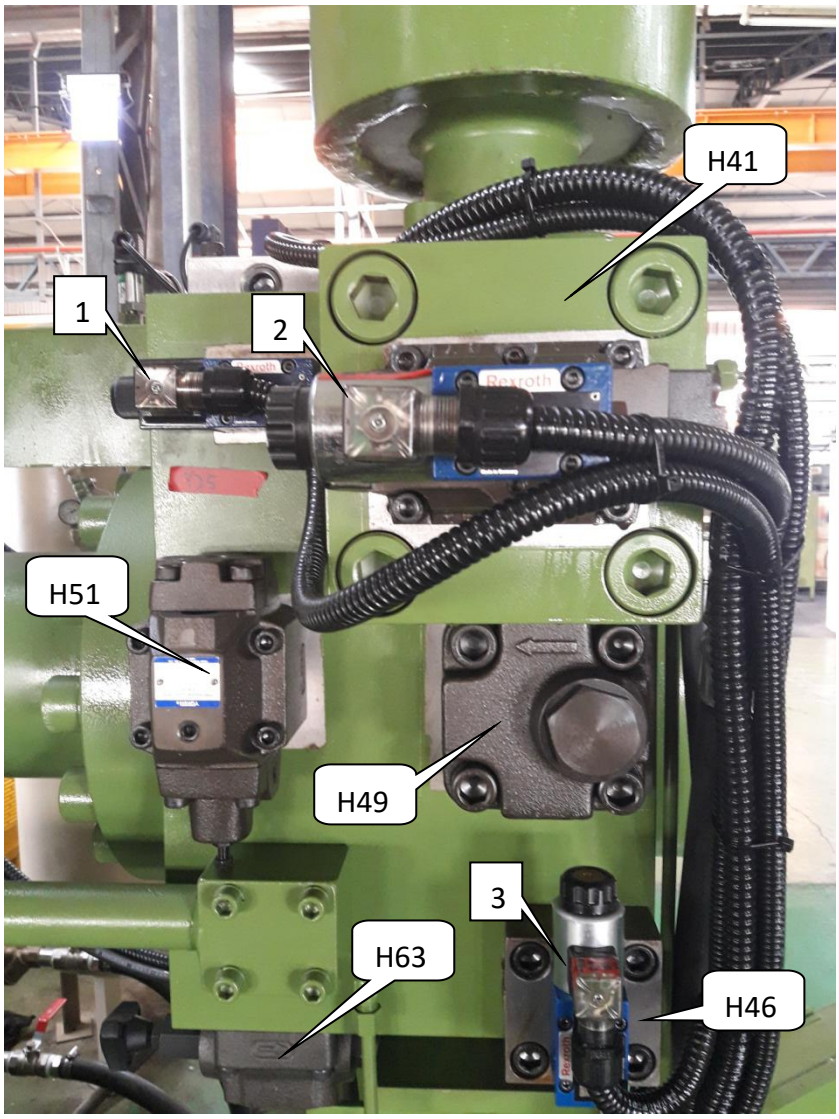
2.緊急停止　X30 0V　Emergenay stop

3.中子 3 出限　X127 0V　Core NO.3 out limit sw socket

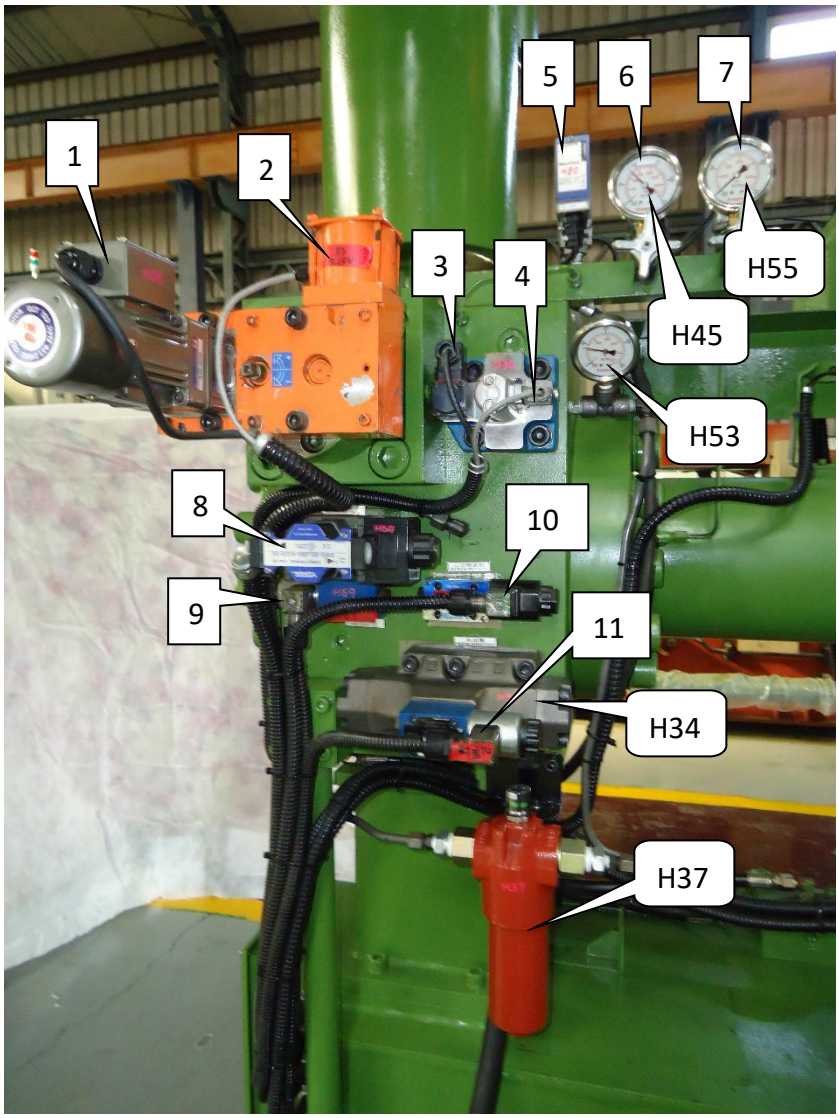
4.中子 3 入限　X126 0V　Core NO.3 IN limit sw socket



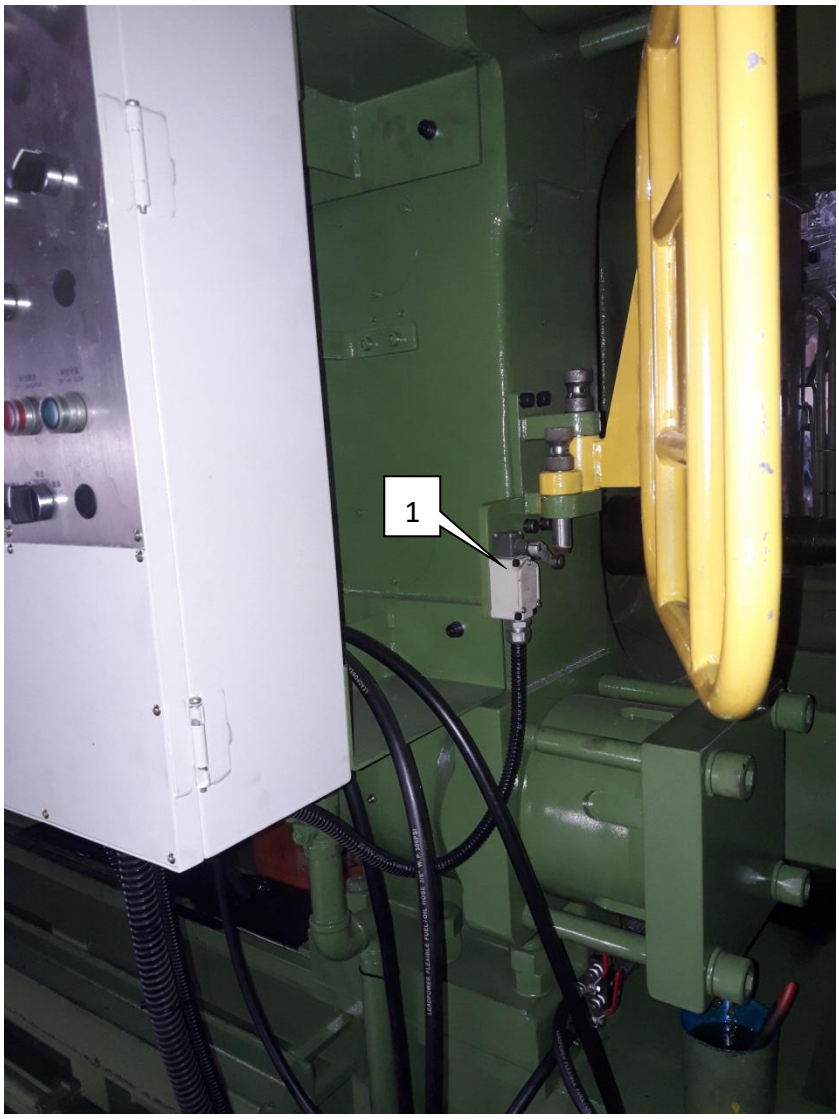
1.中子 2 電磁閥　Y104A Y105A 0V (H33)　Core NO.2 valve
2.中子 1 電磁閥　Y5A Y6A 0V (H30)　Core NO.1 valve
3.押出退電磁閥　Y3A Y4A 0V (H31)　Ejection retract valve



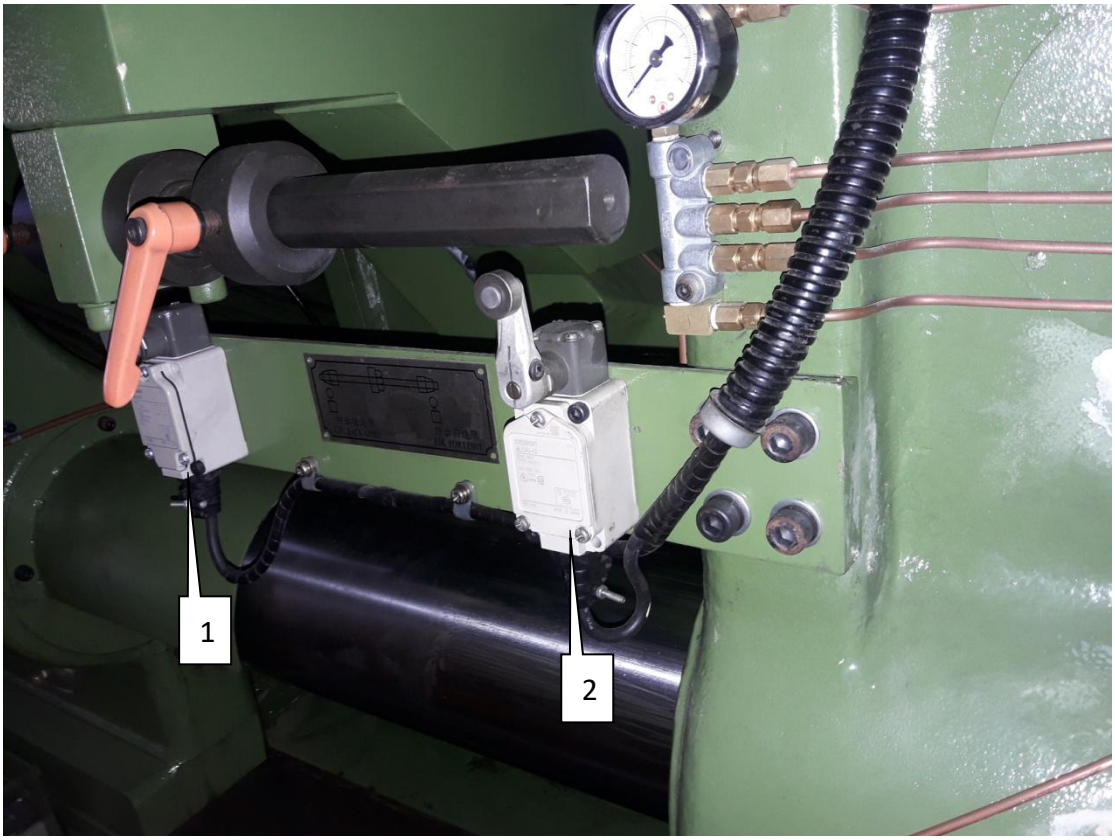
1.增壓電磁閥　Y25A 0V (H54)　Injection intensify pressure valve
2.射進電磁閥　Y11A 0V (H39)　Injection forward valve
3.蓄壓器填充電磁閥　Y27A 0V (H48)　Accumulator



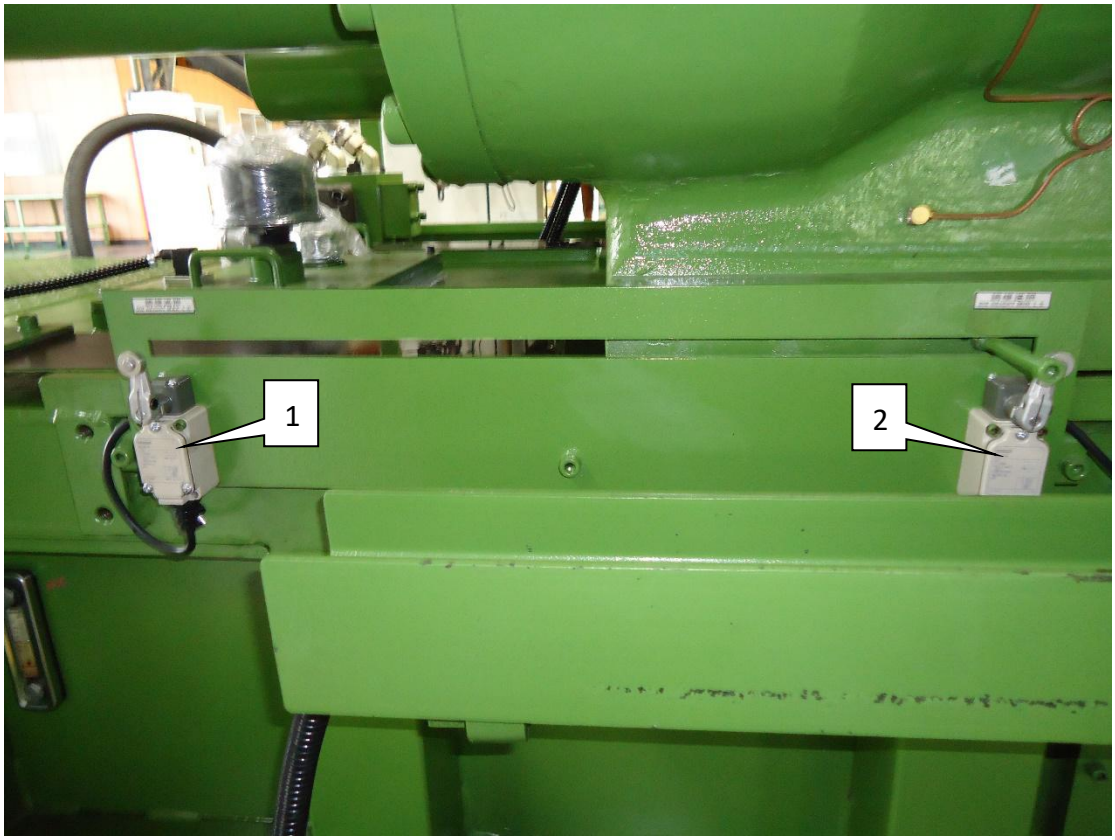
1.快射閥調整馬達　Y102A Y103A 229 13 (H26)　Shot valve adjust motor
2.快射閥電位計　82 +10V 0V (H50)　Shot valve adjust feed back sensor
3.射出比例控制閥　Z26 Z28 (H36)　Injection(slow) speed propertinal valve
4.射出比例控制閥　B14 Z22 B16 (H36)　Injection(slow) speed propertinal valve
5.ACC 壓力上限　X31 (H80)　Accumulator pressure safety sw
6.主蓄壓器壓力感應器　78 24VD 0V (H43)　Main Acc pressure sensor
7.射出壓力感應器　79 24VD 0V (H67)　Injection pressure sensor
8.快射電磁閥(AC220V)　Y13A 13 (H64)　Shot valve pilot valve
9.快射調整電磁閥　Y67A 0V (H69)　Shot valve drain valve for motor-drive
10.二次慢進電磁閥　Y61A 0V (H66)　Injection(slow) valve
11.射退電磁閥　Y12A 0V (H34)　Injection return valve



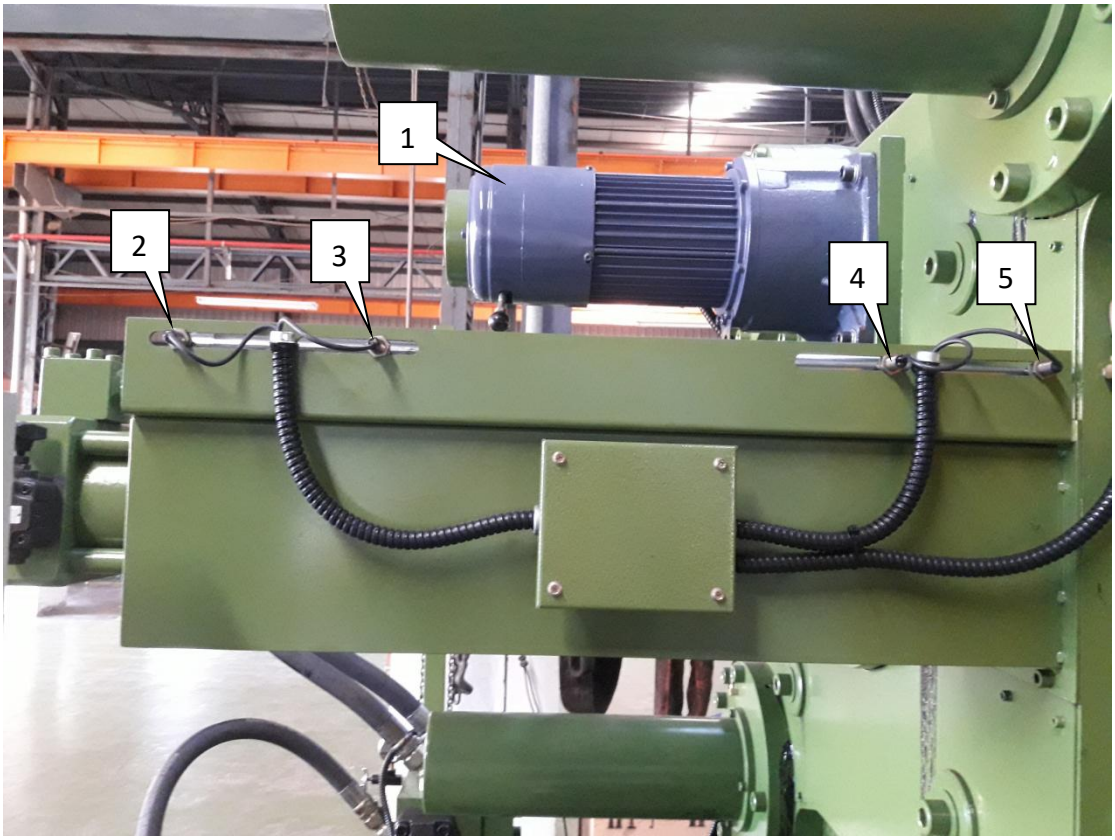
1. 給湯機安全門限動開關　X37 0V Auto ladle safty door sw



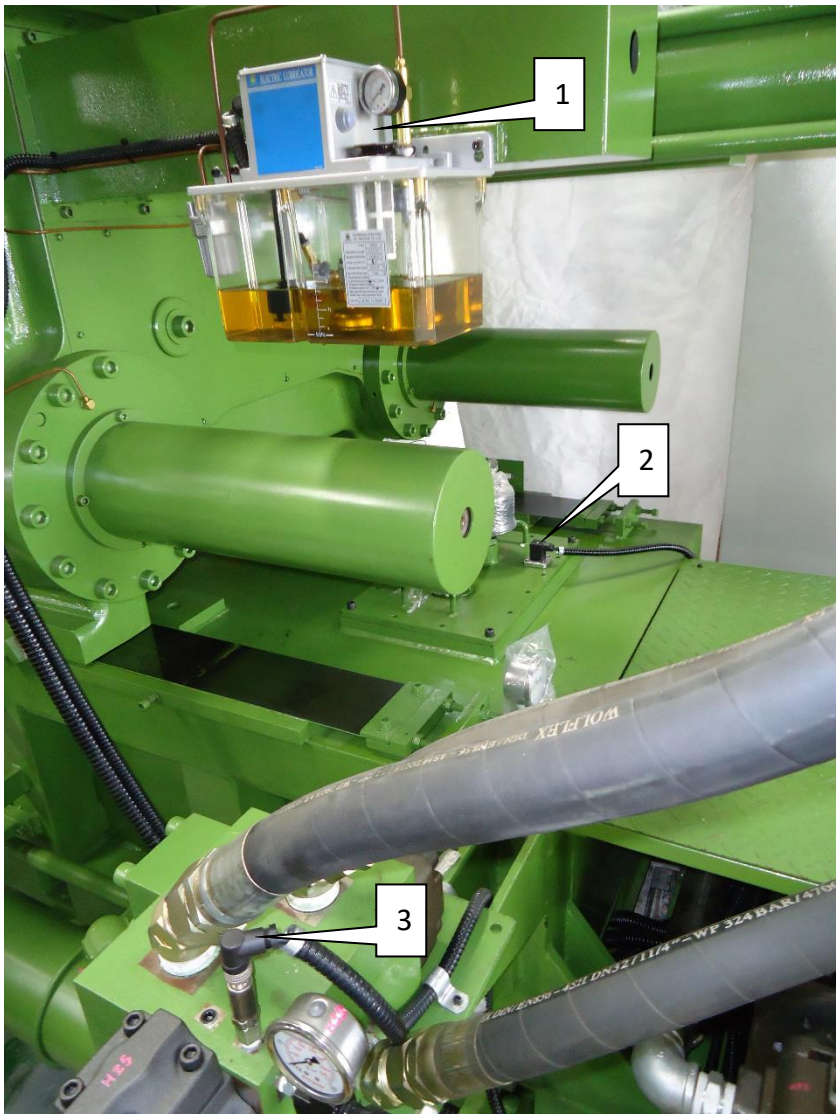
1.押出後退限　X22 0V　Ejection forward limit sw
2.押出前進限　X23 0V　Ejection retract limit sw



1.調模後退限　Y21A Y21B　Die-height adjust backwand limit sw
2.調模前進限　Y7A Y7B　Die-height adjust forward limit sw



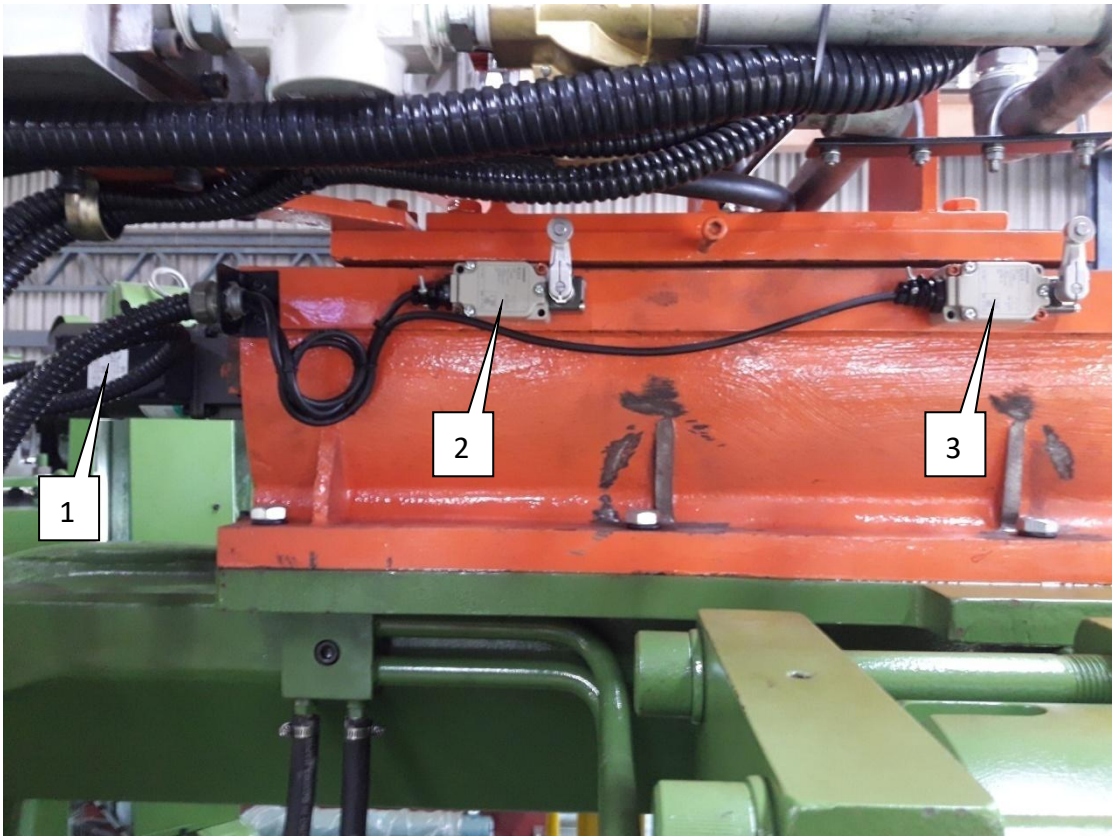
1.調模馬達　U5 V5 W5　Die height adjust motor
2.型開限近接開關　X16 24VD 0V　Die-open limit sw
3.型開減速限近接開關　X17 24VD 0V　Die-open slow limit sw
4.型閉減速限近接開關　X20 24VD 0V　Die-close slow limit sw
5.型閉限近接開關　X27 24VD 0V　Die-close finished limit sw



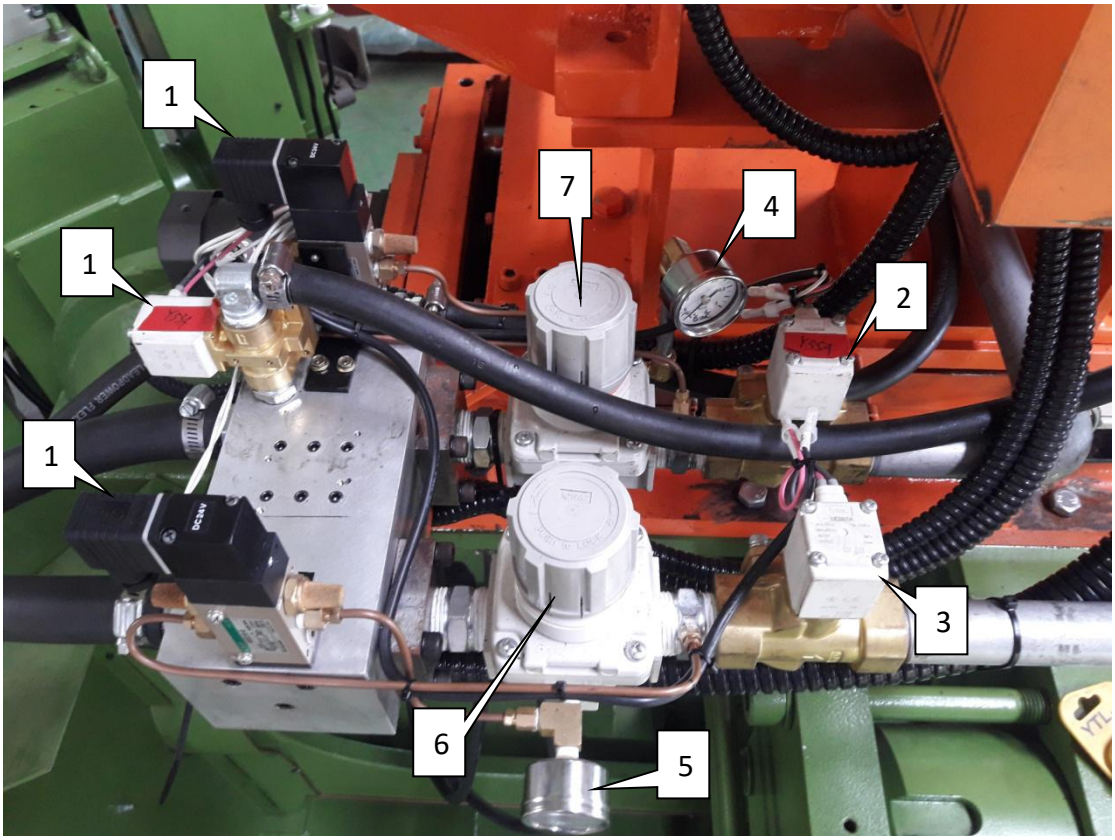
1.曲手潤滑打油機　Y43A 12 13 X75 0V　lubrication pump

2.油量液位開關　X72 0V　Tank oil levd sensor

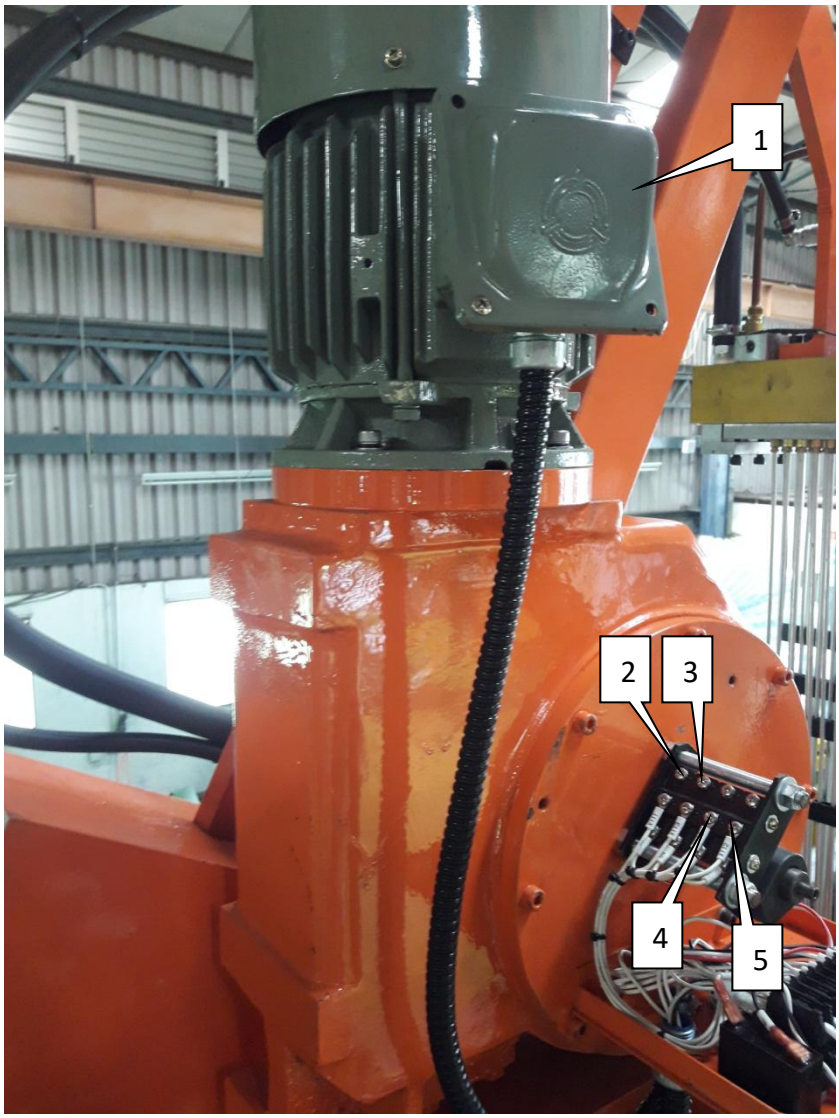
3.壓力感應器　24VD 0V X32.4 X32.5　Servo motor pressure sonsor



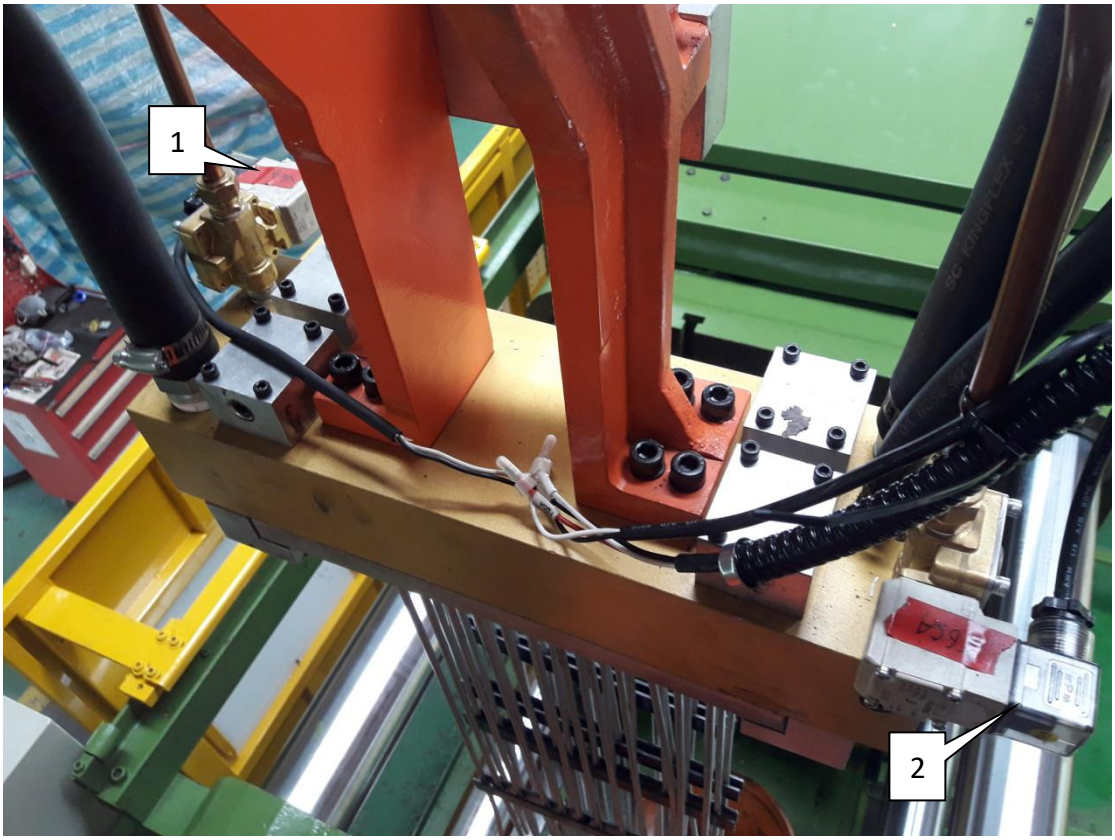
1.噴霧機座台馬達　40 41 13　Spray adjust motor
2.噴霧機座台右移限　38 40　Adjust backward limit sw
3.噴霧機座台左移限　39 41　Adjust forward limit sw



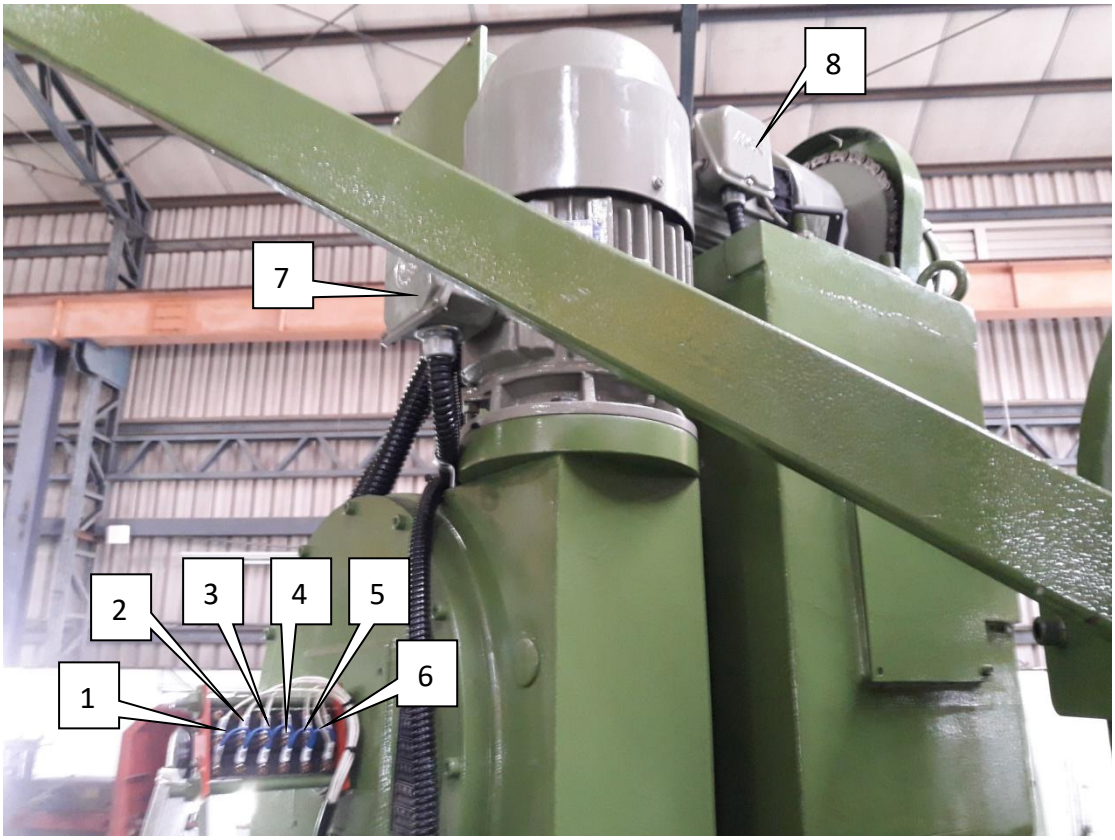
1.噴霧機吹氣電磁閥　Y53A 0V　Air blow valve
2.固定模噴霧氣閥　Y55A 0V　Fix half spray air valve
3.活動模噴霧氣閥　Y54A 0V　Moving half spray air valve
4.固定模氣壓表　Fix half preumatic pressure gorge
5.活動模氣壓表　Moving half preumatic pressure gorge
6.活動模調壓閥　Moving half air pressure regulaton
7.固定模調壓閥　Fix half air pressure regulaton



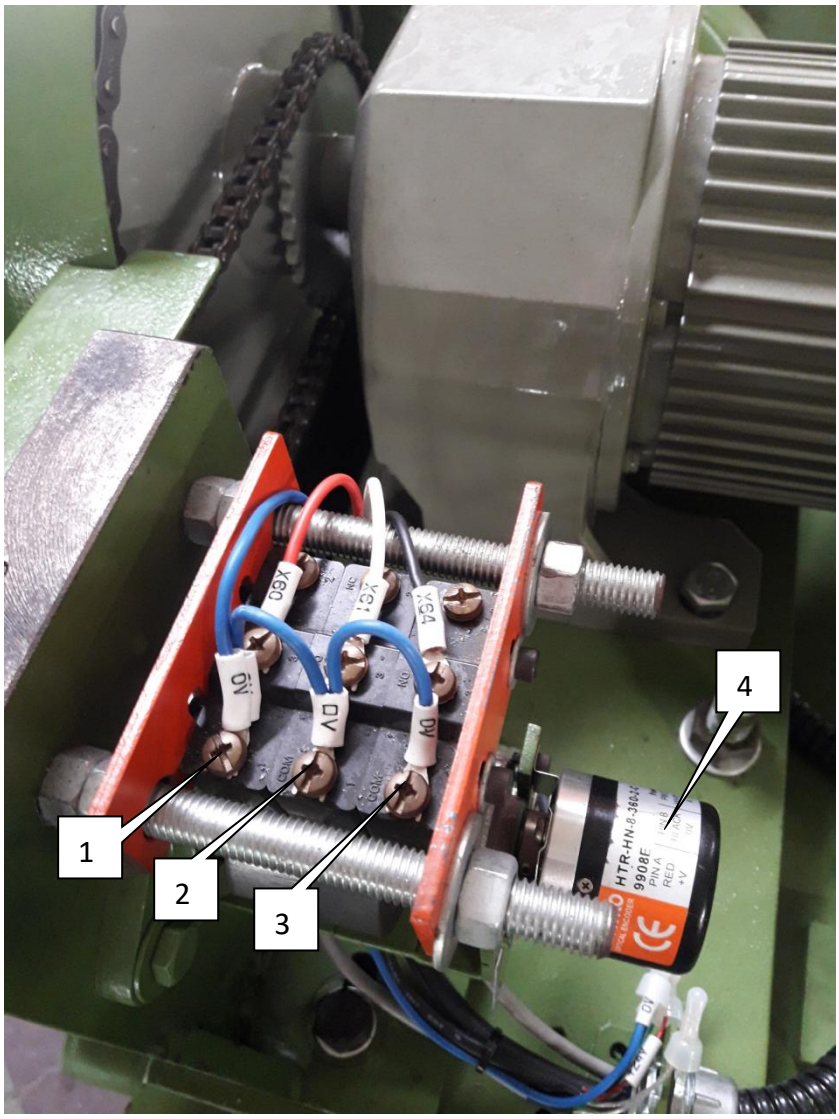
1.噴霧機馬達　U3 V3 W3 Y52A 13　Auto spray motor
2.噴霧機上升限　X111 0V　Up ward limit sw
3.噴霧機上升減速限　X113 0V　Up ward slow limit sw
4.噴霧機下降減速限　X114 0V　Down ward slow limit sw
5.噴霧機下降限　X112 0V　Down ward limit sw



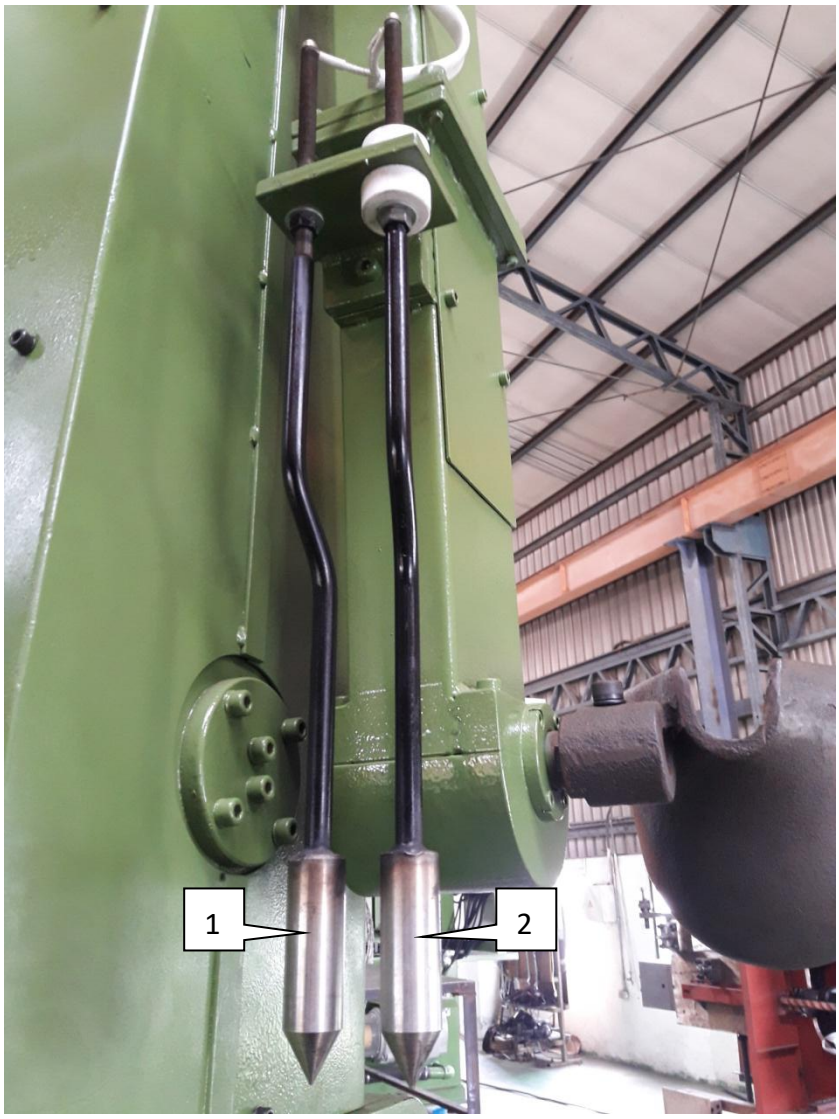
1.噴霧機固定模噴霧電磁閥　Y66A 0V　Fix half die-coat shut off valve
2.噴霧機活動模噴霧電磁閥　Y65A 0V　Moving half die-coat shut off valve



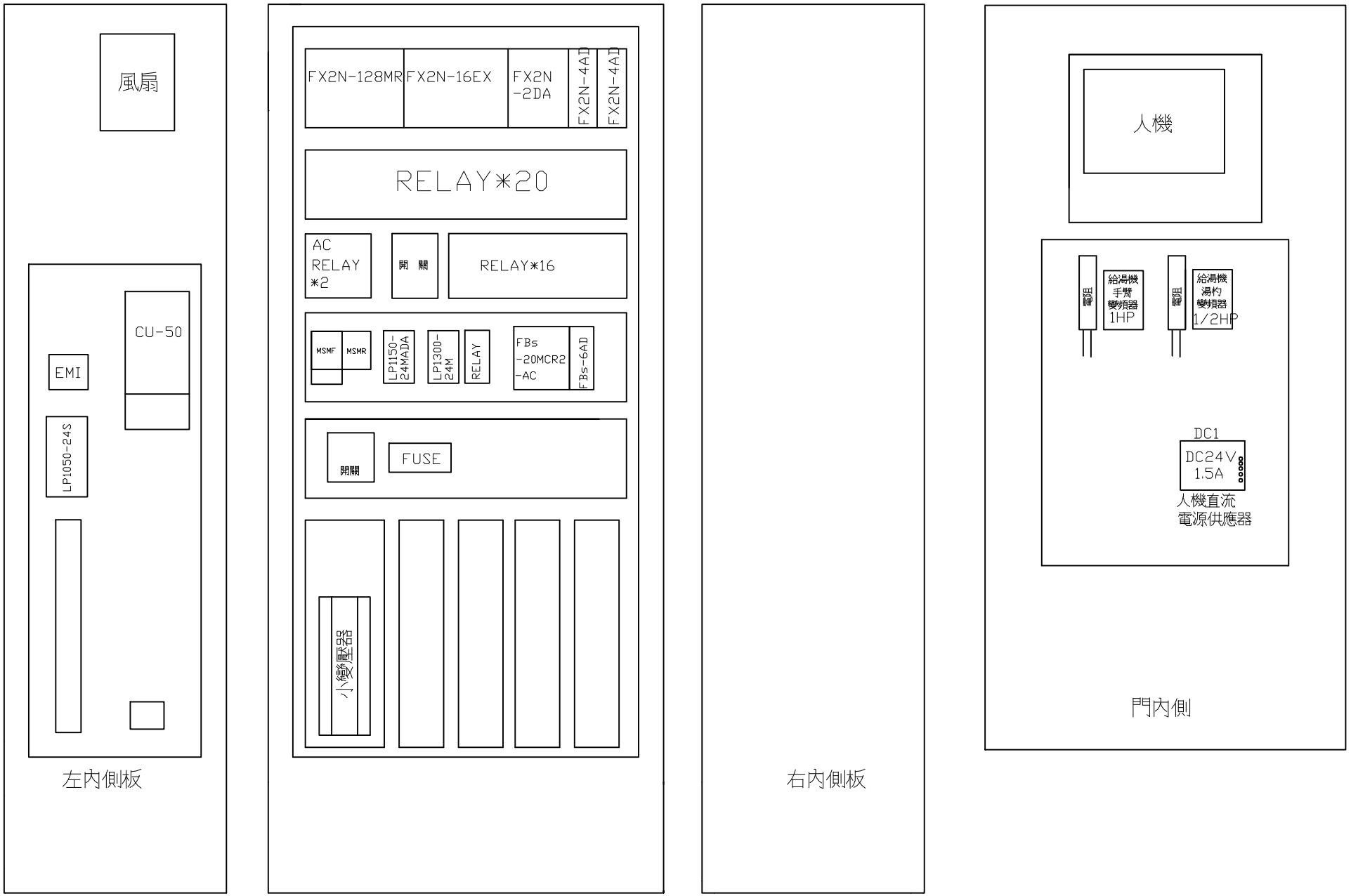
1.給湯機手臂前進安全限　X56 0V　Ladle arm forward safety limit sw
2.給湯機手臂前進限　X55 0V　Ladle arm forward limit sw
3.給湯機手臂前進減速　X54 0V　Arm forward slow position
4.給湯機手臂後退待機位置　X53 0V　Arm backward standby position
5.給湯機手臂後退減速　X52 0V　Arm backward slow position
6.給湯機手臂後退限　X51 0V　Arm backward limit sw
7.給湯機手臂馬達　U1 V1 W1 Y46A 13　Arm drive motor
8.給湯機湯杓馬達　U2 V2 W2 Y47A 13　Cup drive motor



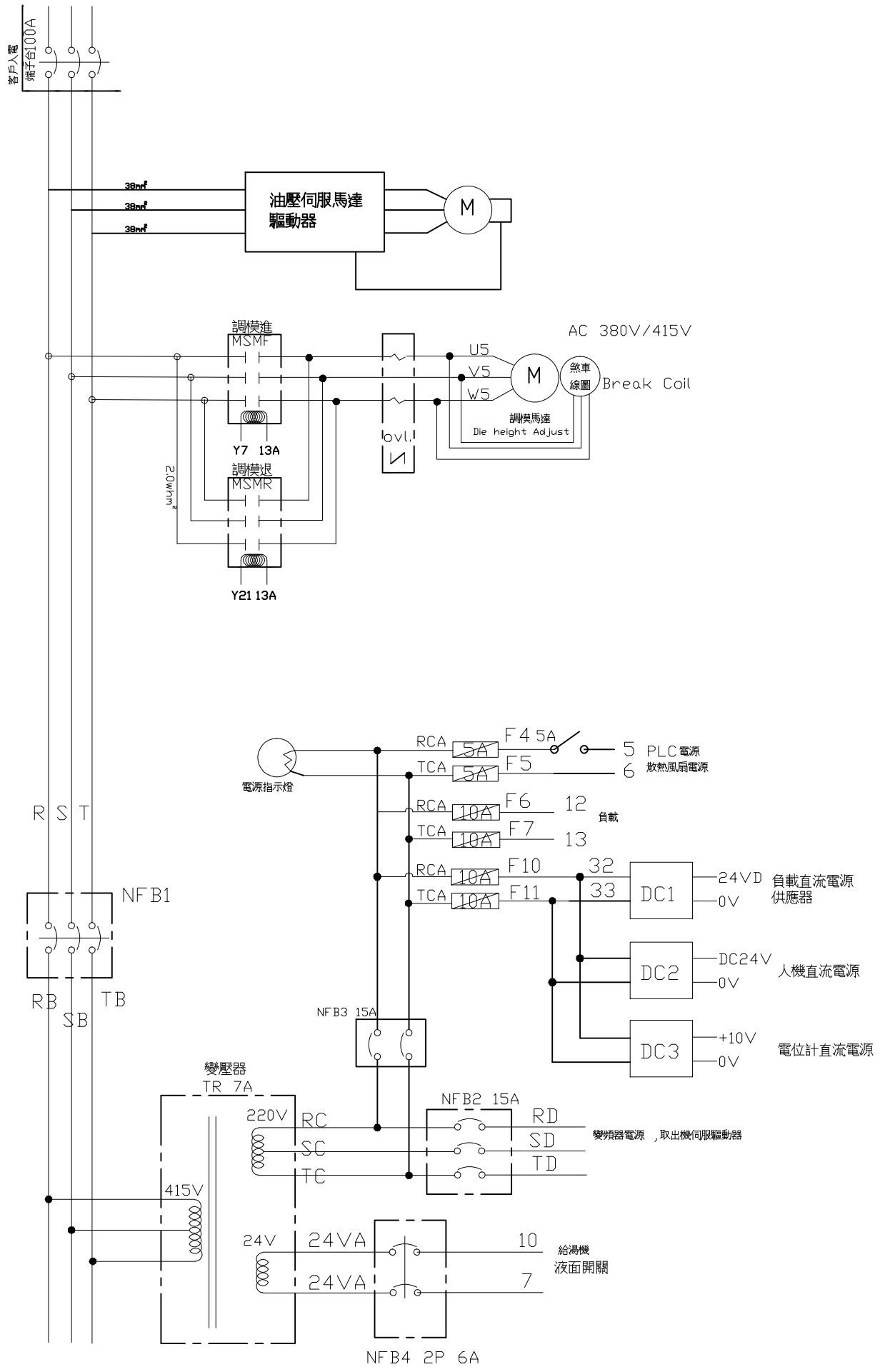
1.湯杓注湯限　X60 0V　Cup pouring limit sw
2.湯杓水平限　X61 0V　Cup horizontal position limit sw
3.注湯安全限　X64 0V　Pouring safety limit sw
4.湯量調整　X2 24VD 0V　Metal amount enconder



1.湯面檢出　8　Level detect bar
2.斷線檢出　10 9　Cable broken alarm

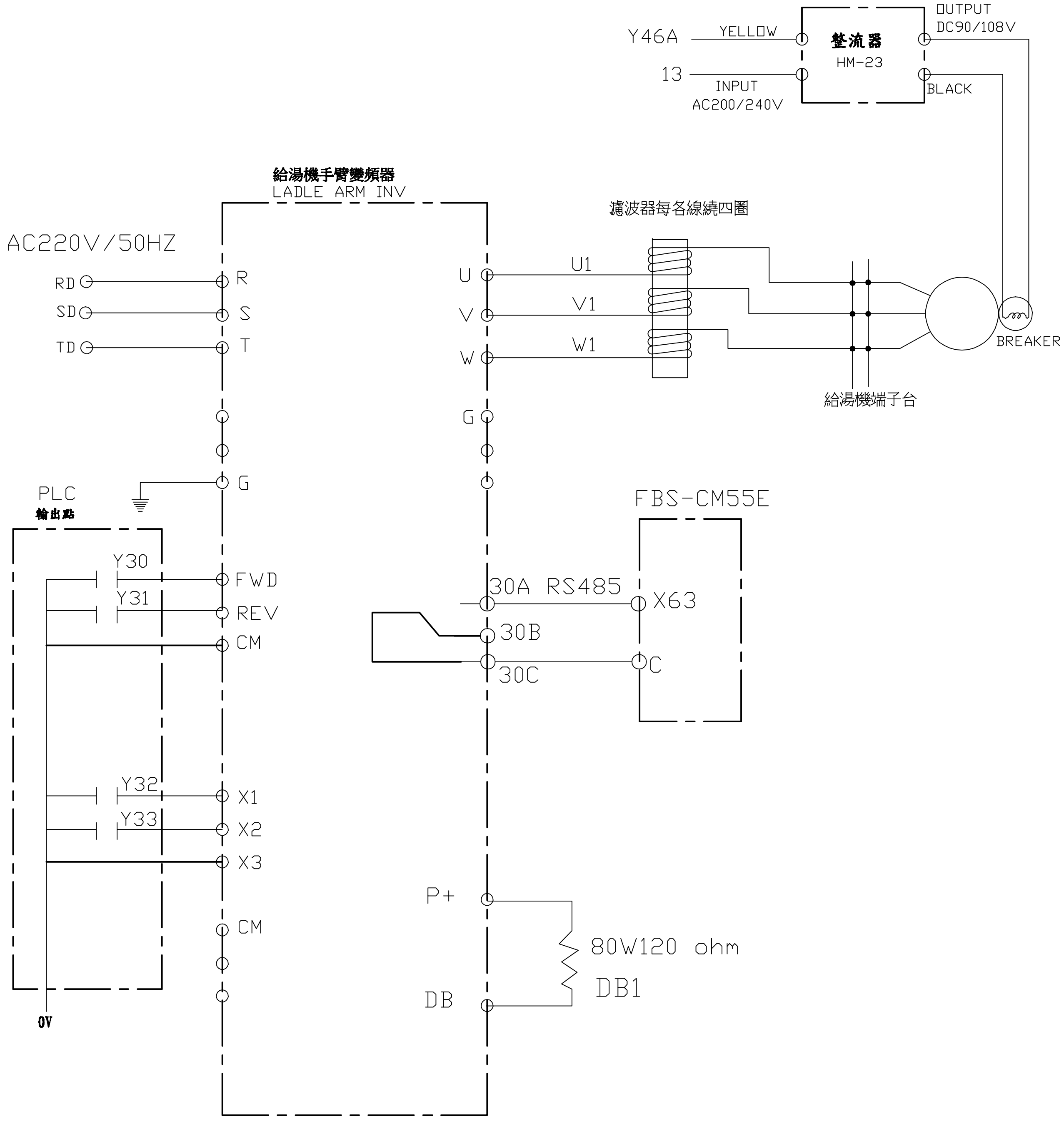


核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	控制箱配置圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F				
設計				數量	1	日期	2013/03/04		圖號	FB-09	第1頁



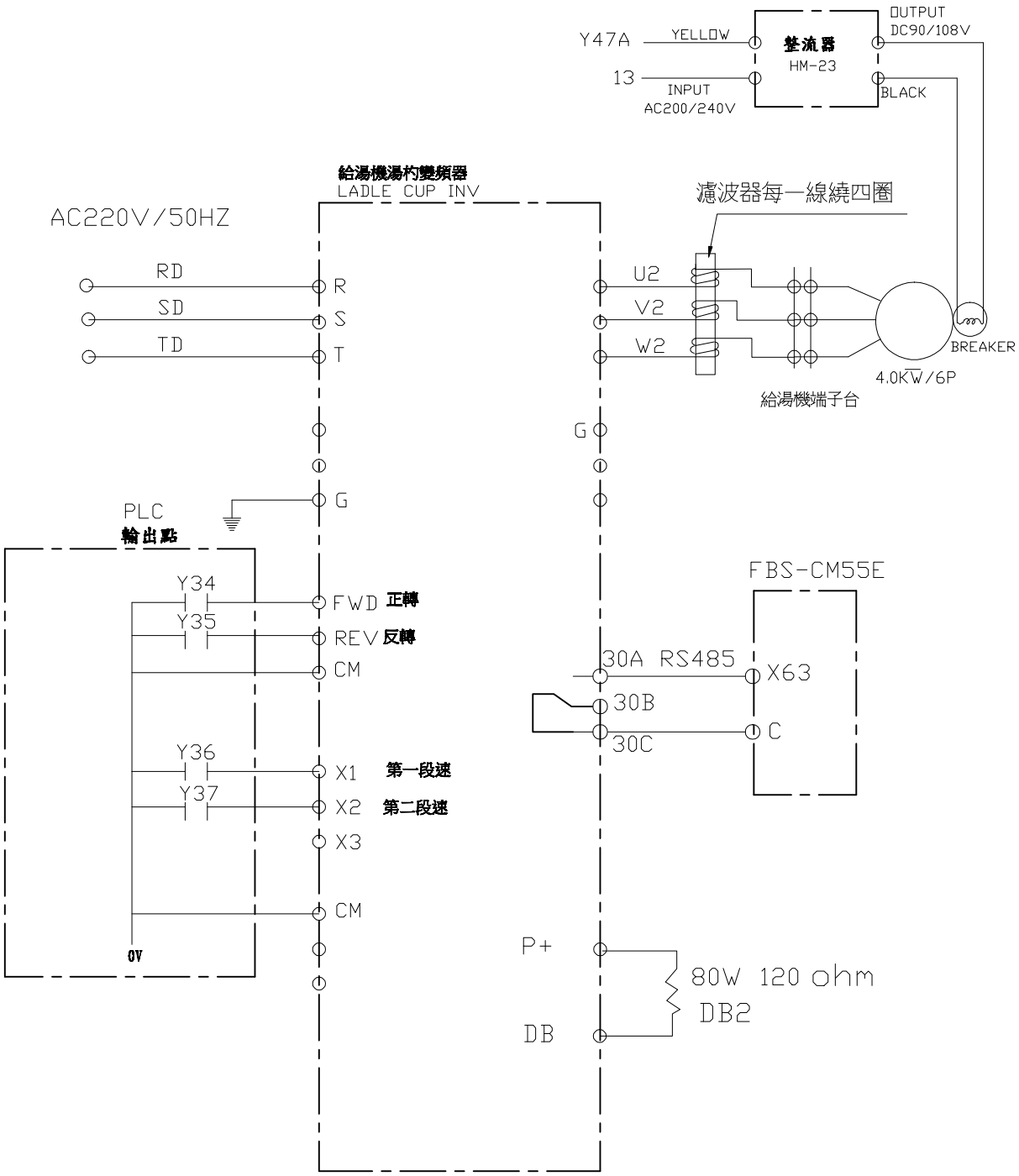
圖名	緩沖啓動電源配線圖						2013年版
圖號	FB-03						第1頁
投影	比例	日期					
	F	2013/03/04					
單位	材質	數量					
mm		1					
機型	V4N型+給湯+伺服馬達						
核准	檢圖	設計					

永鈑機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.



2013年版	第1頁
圖名	給湯手臂變頻器
圖號	FB-01
投影	
比例	F
日期	2013/03/04
單位	mm
材質	
數量	1
機型	V4N型+給湯+伺服馬達
校準	
檢圖	
設計	

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

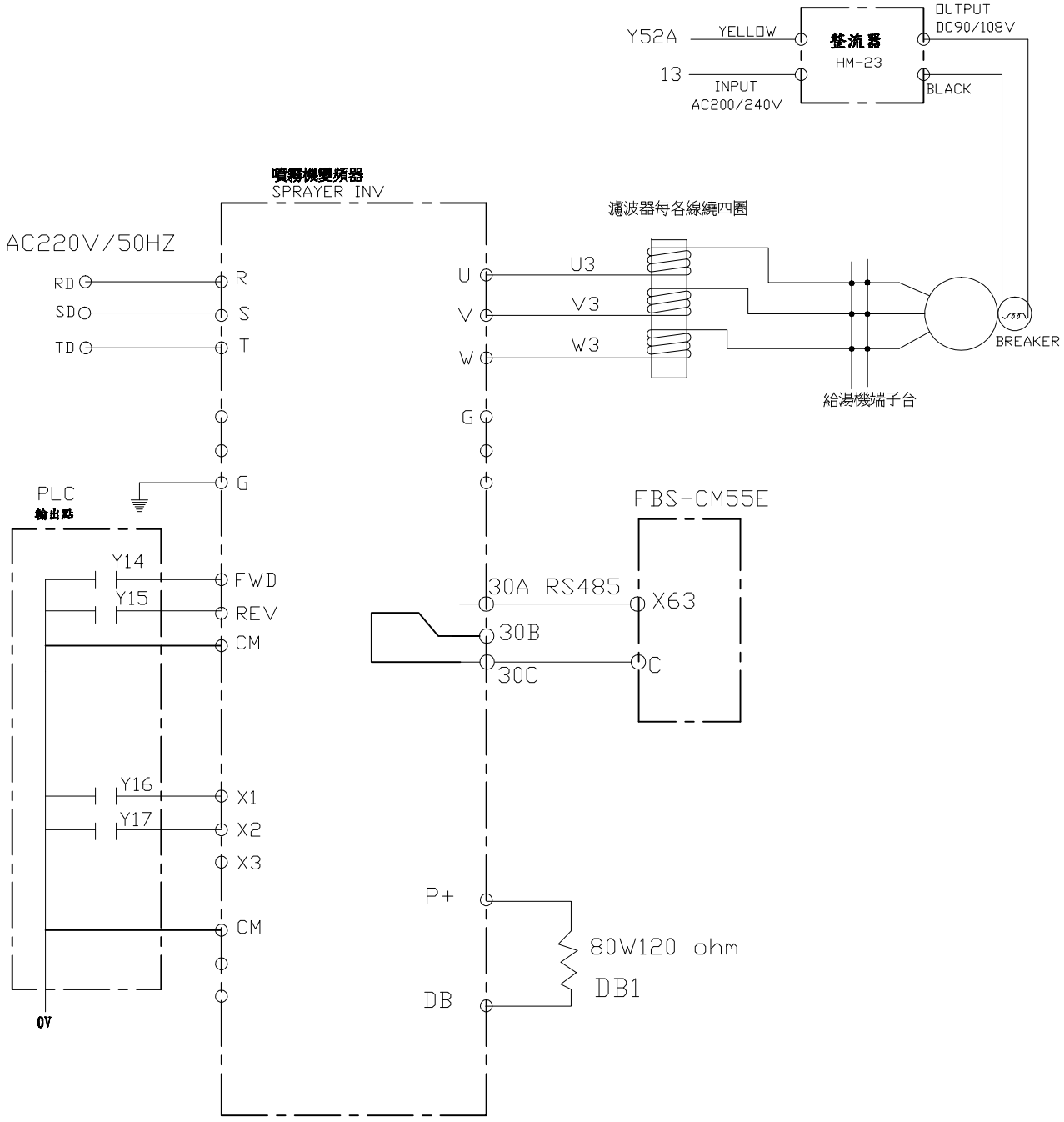


2013年版	第1頁		
M/C+AL	FB-02		
圖名	圖號		
投影	比例	F	2013/03/04
mm		1	日期
單位	材質	數量	

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

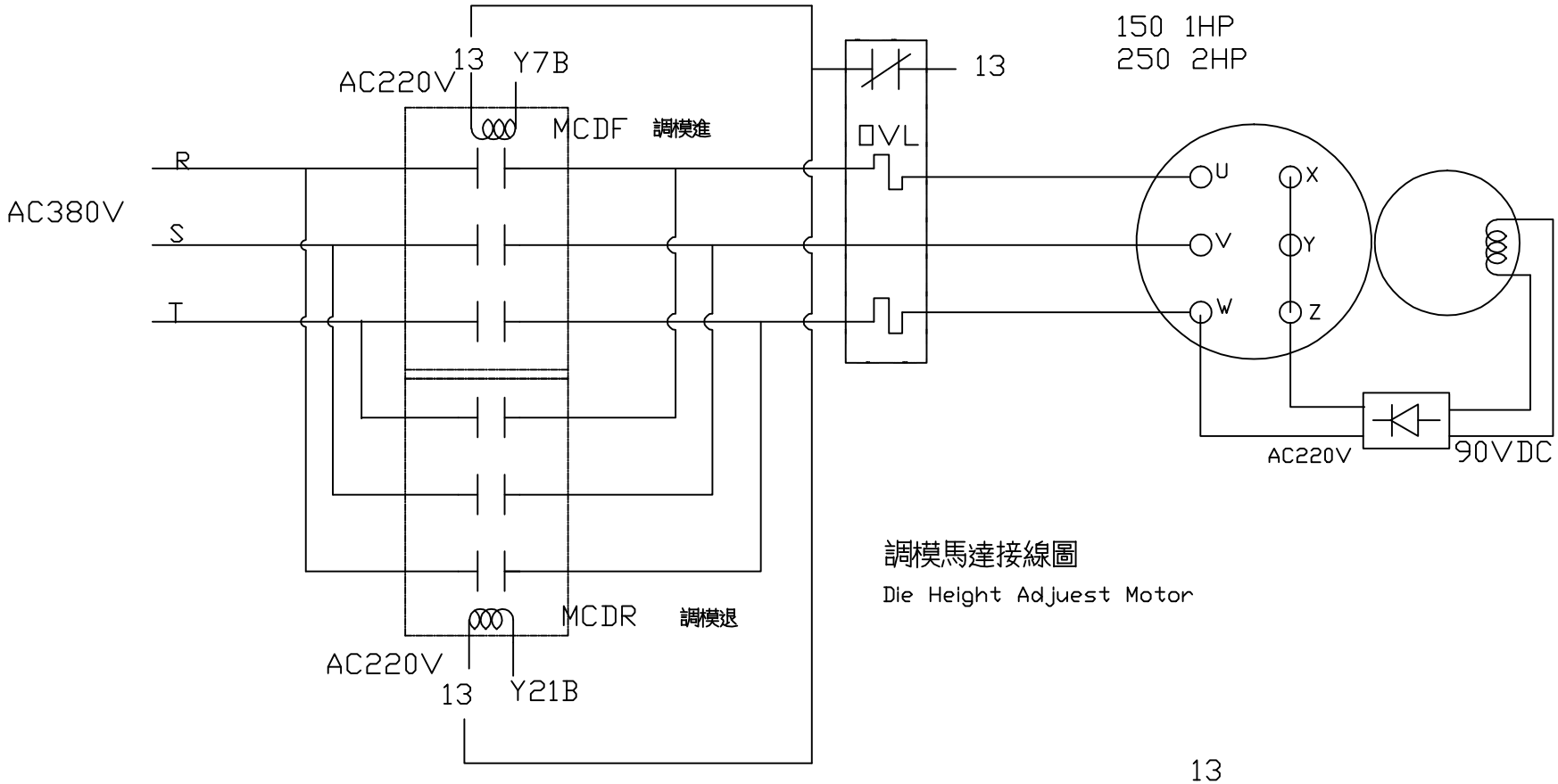
機型 V4N型+給湯+伺服馬達

核準	檢圖	設計



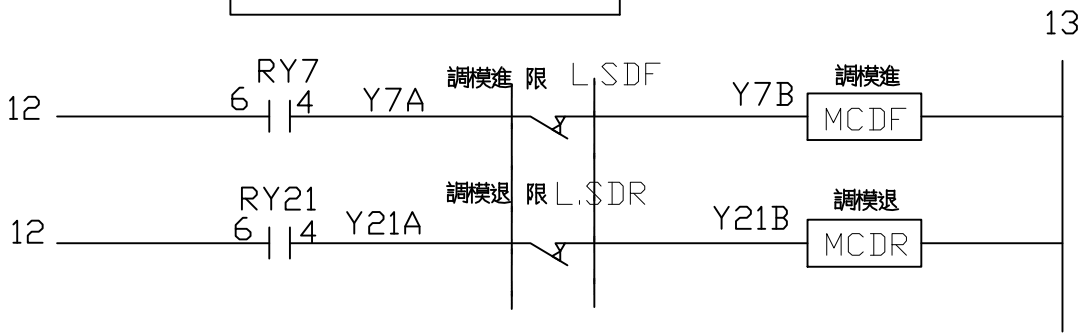
圖名	噴霧機變頻器	2013年版	第1頁
圖號	FB-01		
投影	比例	F	2013/03/04
單位	材質	數量	日期
mm		1	
機型	V4N型+給湯+伺服馬達		
核準	檢圖	設計	

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.



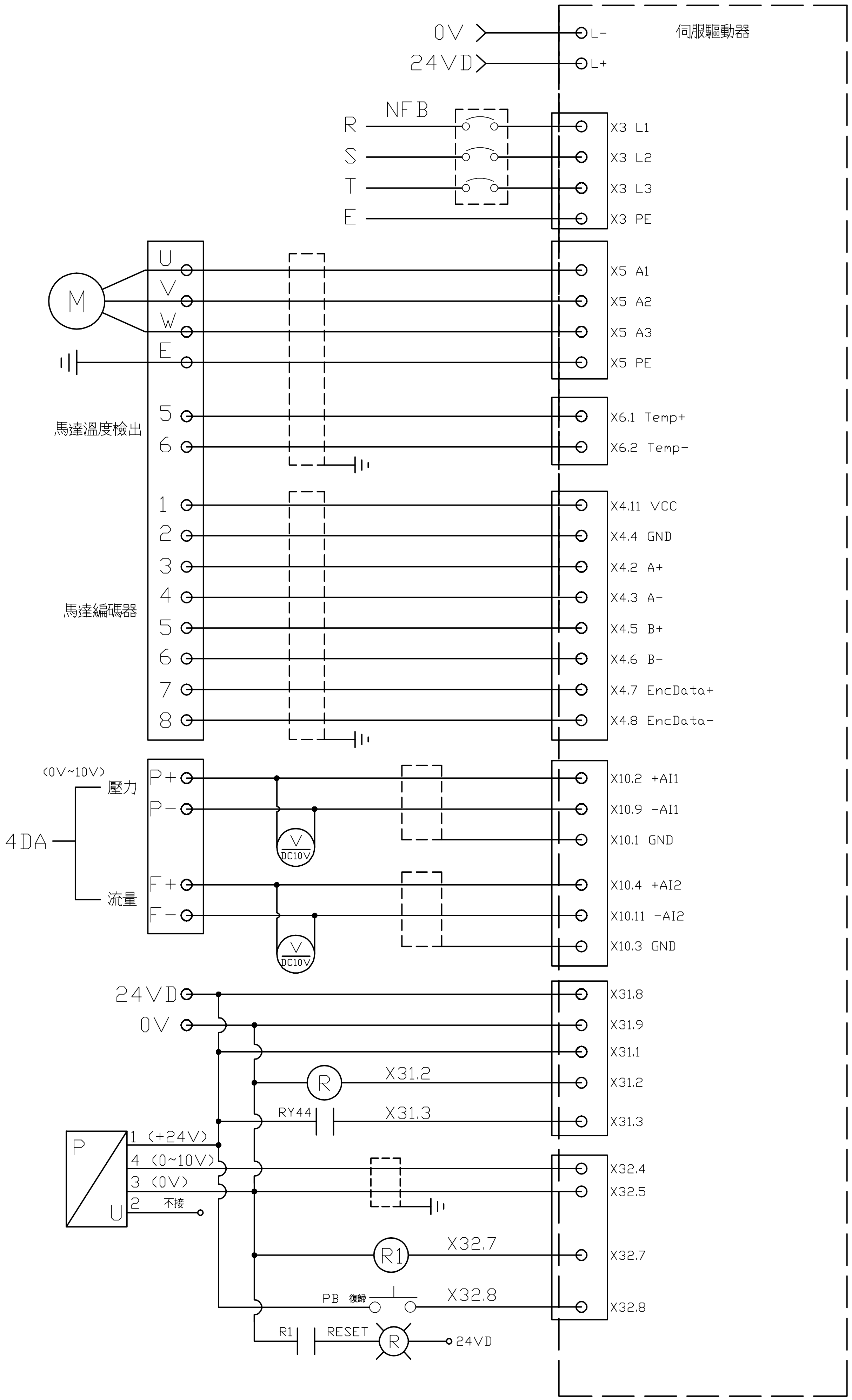
調模馬達接線圖

Die Height Adjuest Motor



中子端子台

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	調模馬達配線圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F				
設計				數量	1	日期	2013/03/04		圖號	FB-08	第1頁



2013年版

第1頁

圖名 節能伺服馬達接線圖

圖號 FB-14

投影

比例 F

日期 2013/03/04

單位 mm

材質

數量 1

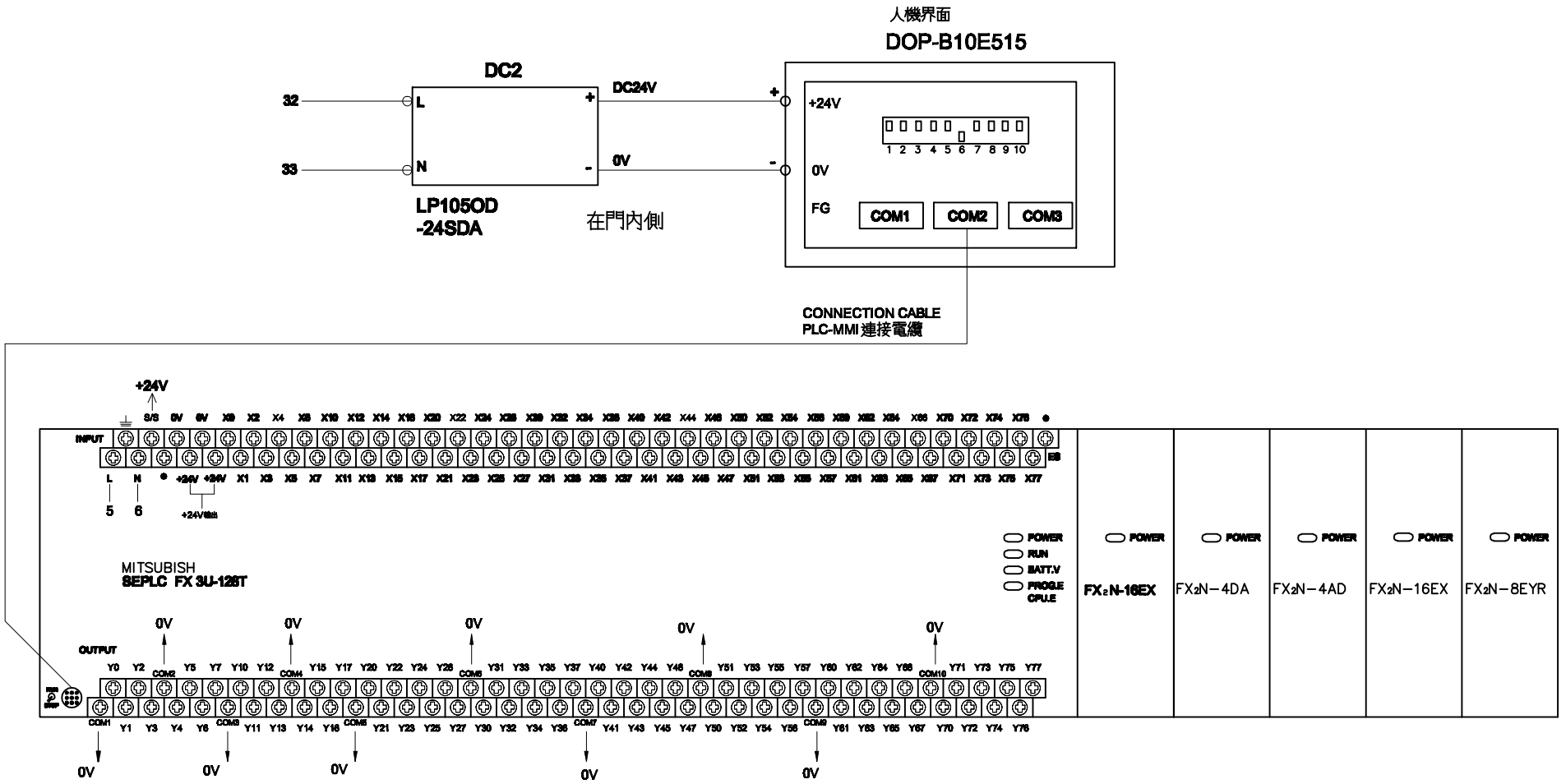
永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型 V4N型+給油+伺服馬達

校準

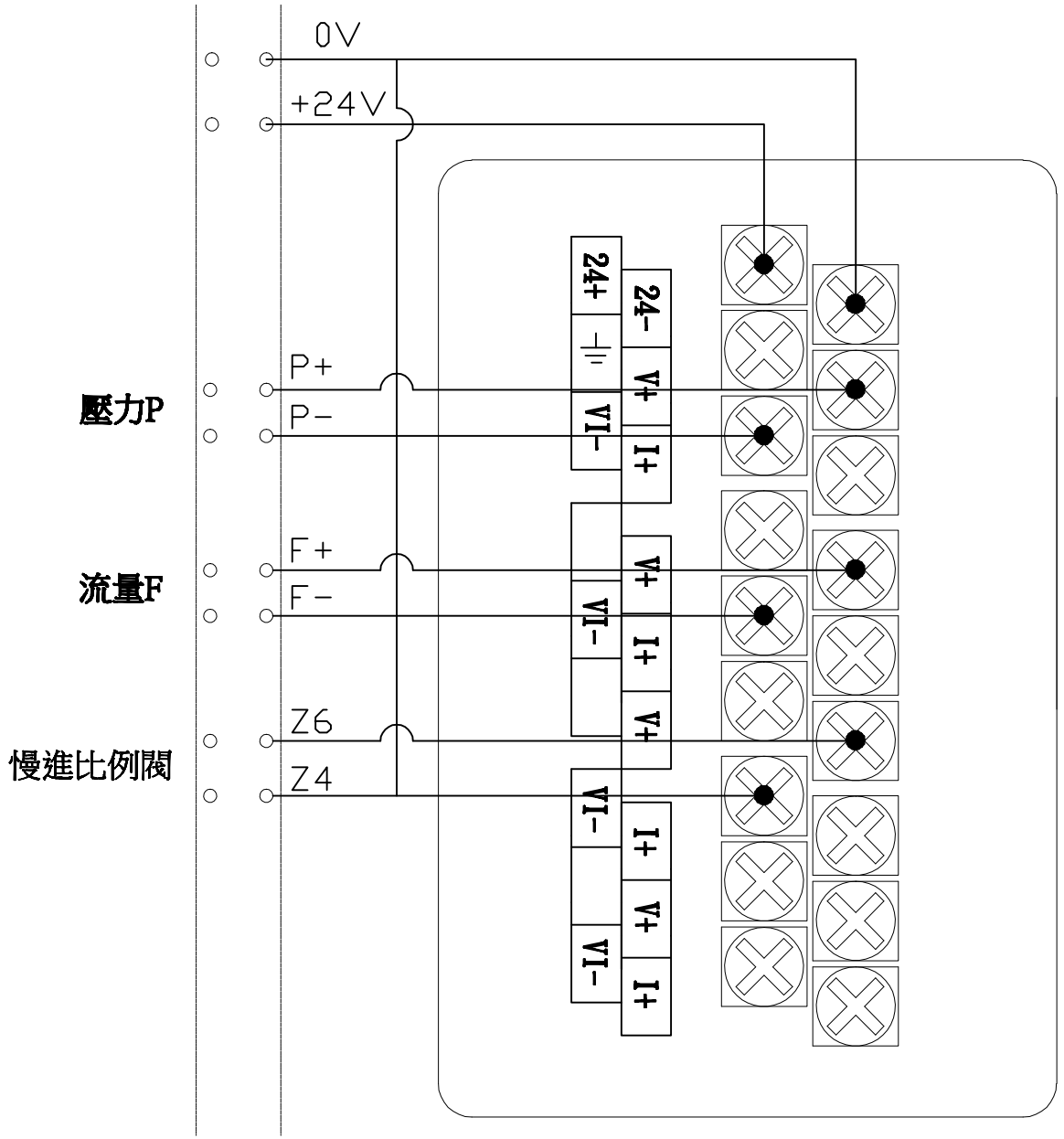
檢圖

設計

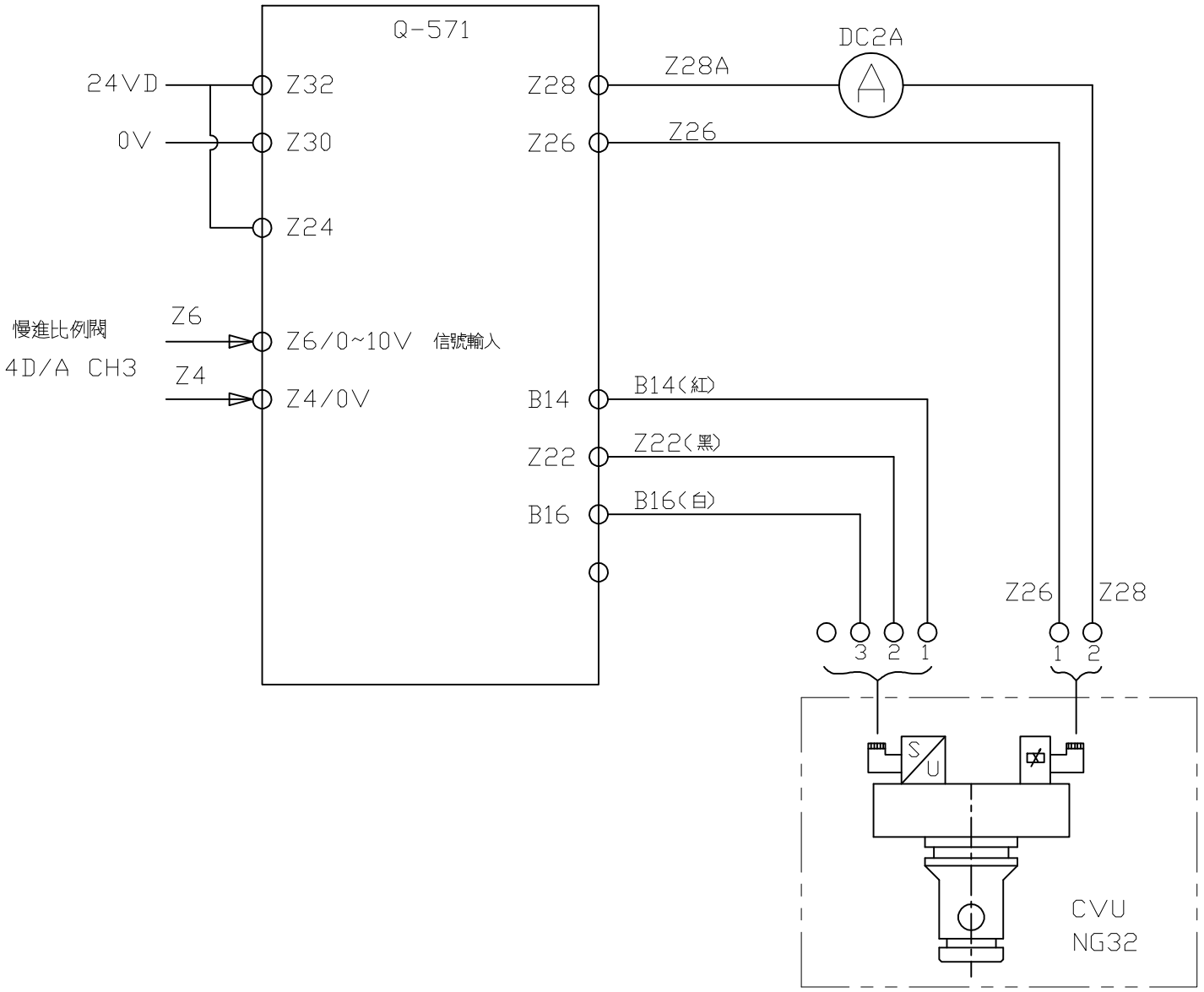


全配+比例閥+射出電
動調整+液壓節能伺服

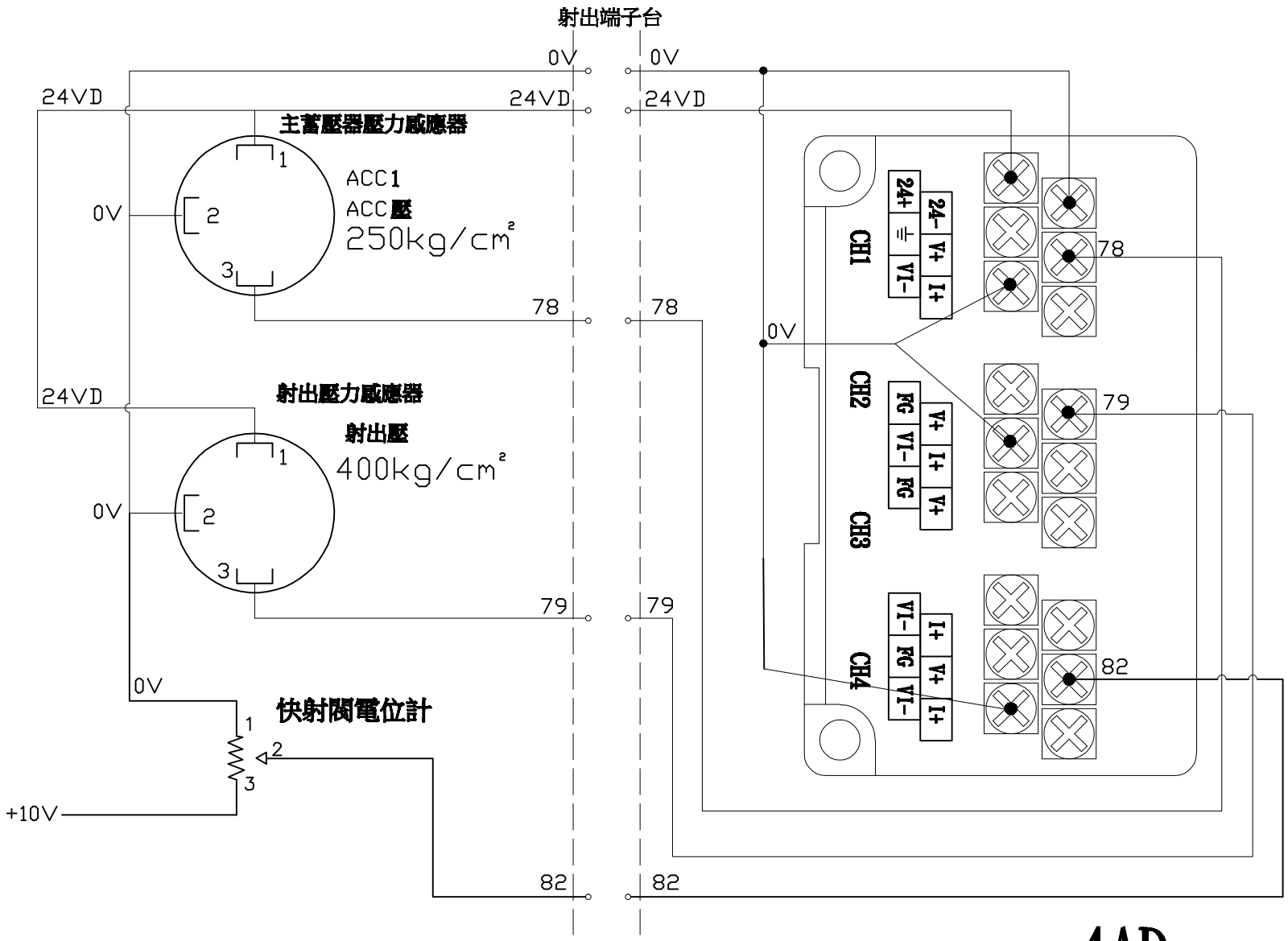
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	PLC接線圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F		圖號	B-04	第1頁
設計				數量	1	日期	2013/03/29				



核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	4DA配線圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F		圖號	FB-05	第1頁
設計				數量	1	日期	2013/03/04				



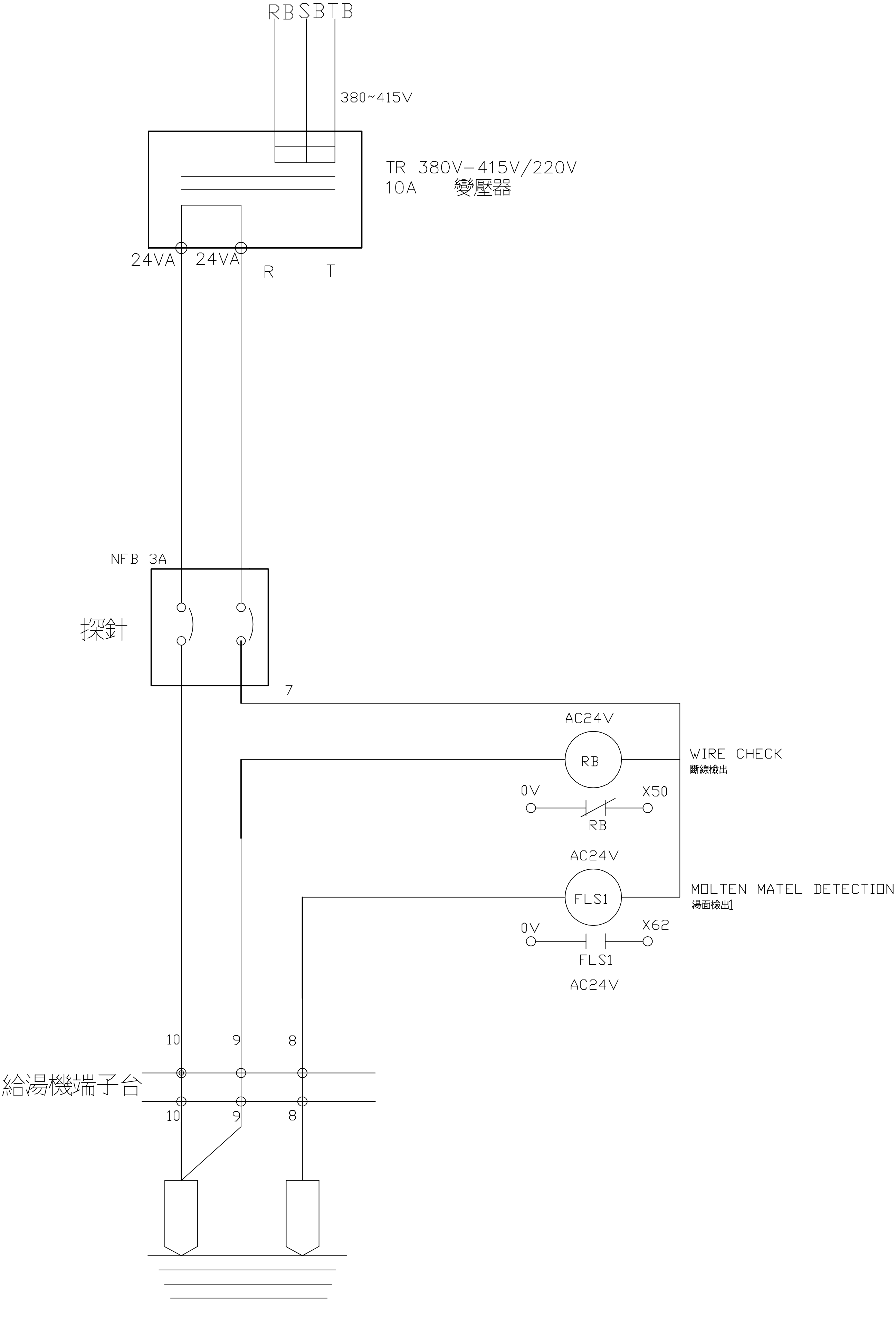
核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	射出比例控制閥線路圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F				
設計				數量		日期	2013/03/02		圖號	FB-12	第1頁



4AD

壓力感應器類比輸入模組

核準		機　型	永欽機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	壓力感應器4AD配線圖	2011年版
檢圖		共用機種		材質		比例	F				
設計				數量	1	日期	2011/12/15		圖號	B-06	第1頁

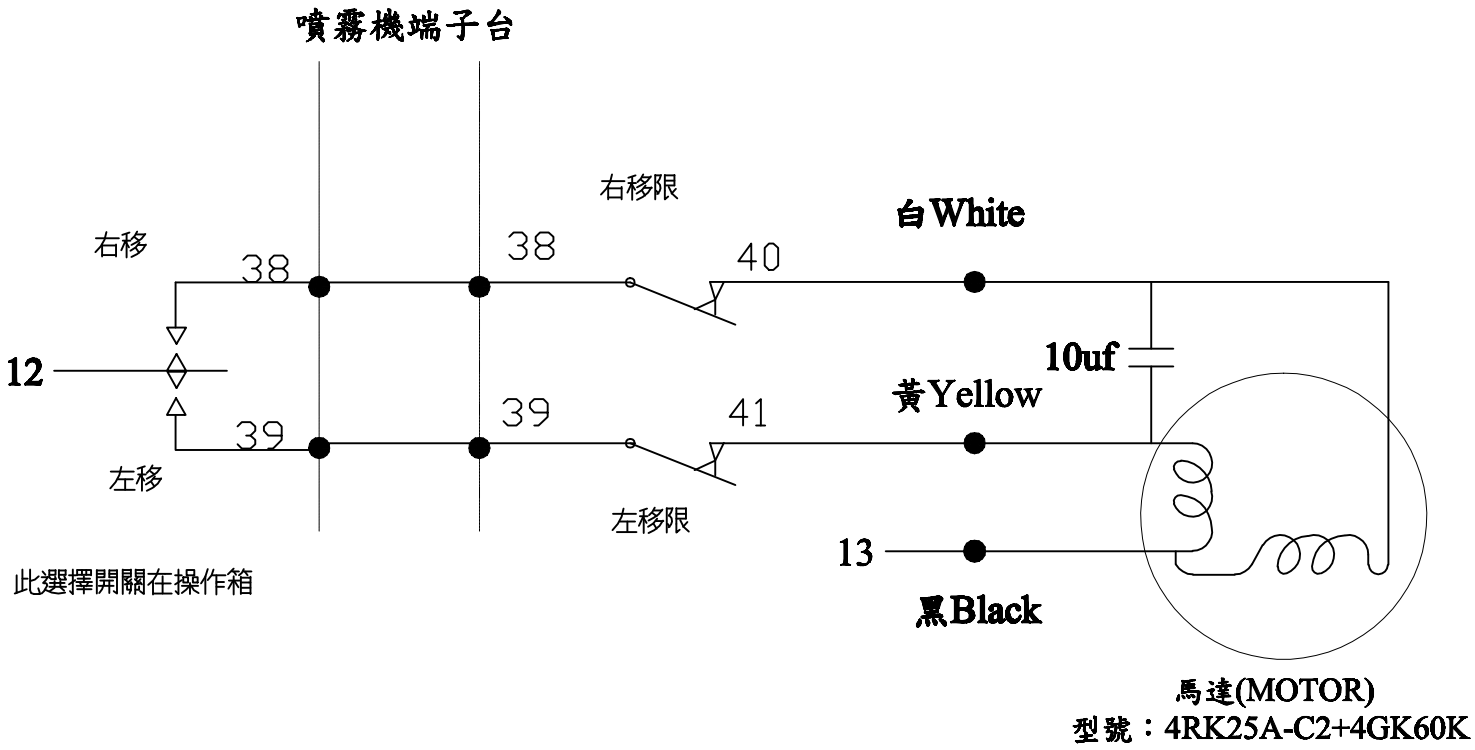


圖名	液面控制配線圖
圖號	FB-07
版	2013年版
頁	第1頁
核準	
檢圖	
設計	
投影	
比例	F
日期	2013/03/04
單位	mm
材質	
數量	

永鉅機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

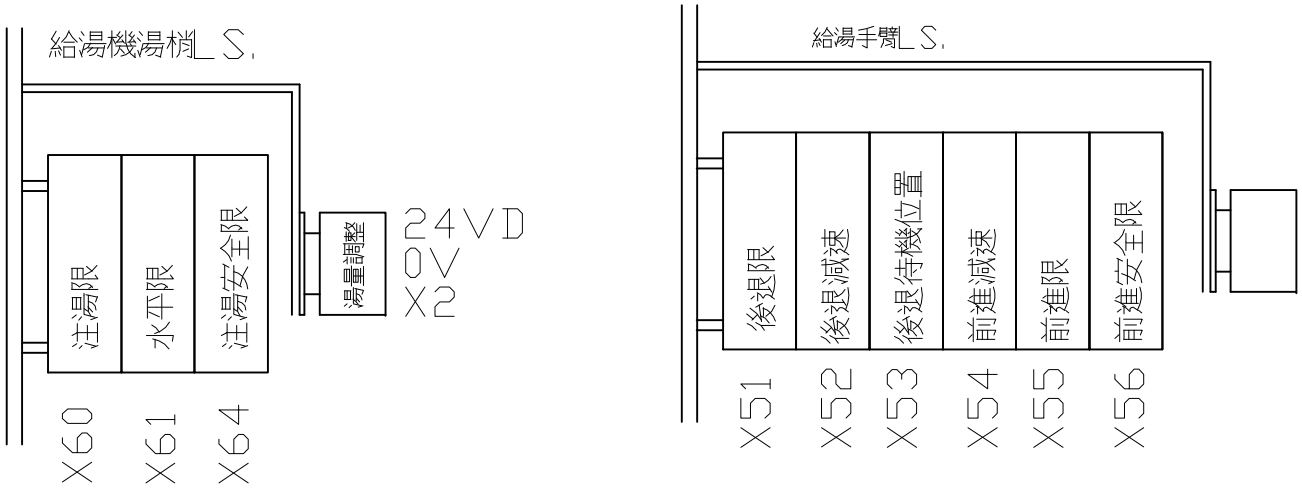
次數	設變原因	姓名	日期
1			
2			
3			

噴霧機座台馬達接線圖
(Auto Spray Table adjust Motor)

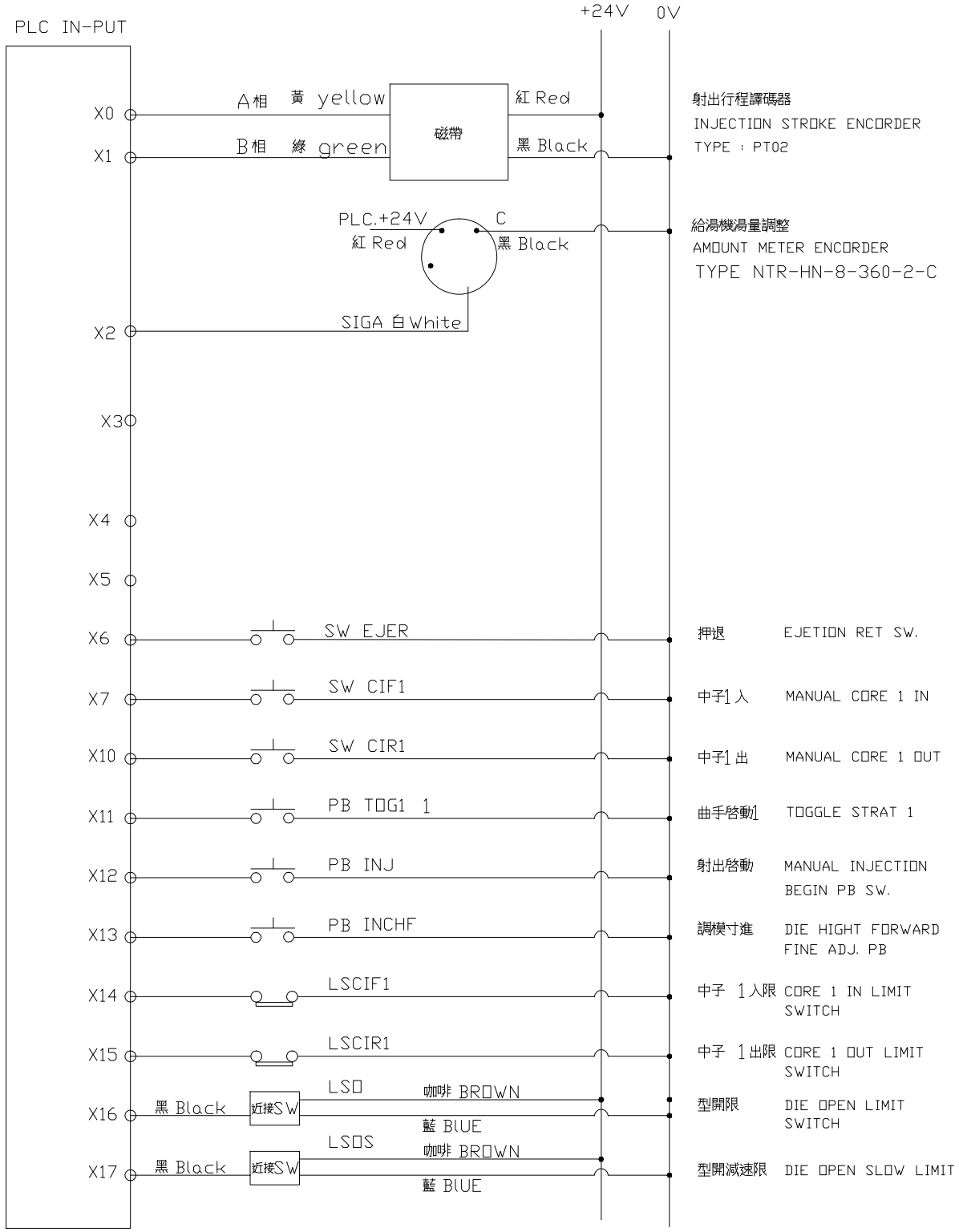


M/C+AL+SP

核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	噴霧滑座馬達配線圖	2011年版
檢圖		共用機種		材質		比例	F				
設計				數量	1	日期	2011/07/25		圖號	FB-17	第1頁



核準		機　型	永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.	單位	mm	投影			圖名	給湯噴霧_S配線圖	2013年版
檢圖		V4N型+給湯+伺服馬達		材質		比例	F				
設計				數量	1	日期	2013/03/04		圖號	FB-11	第1頁



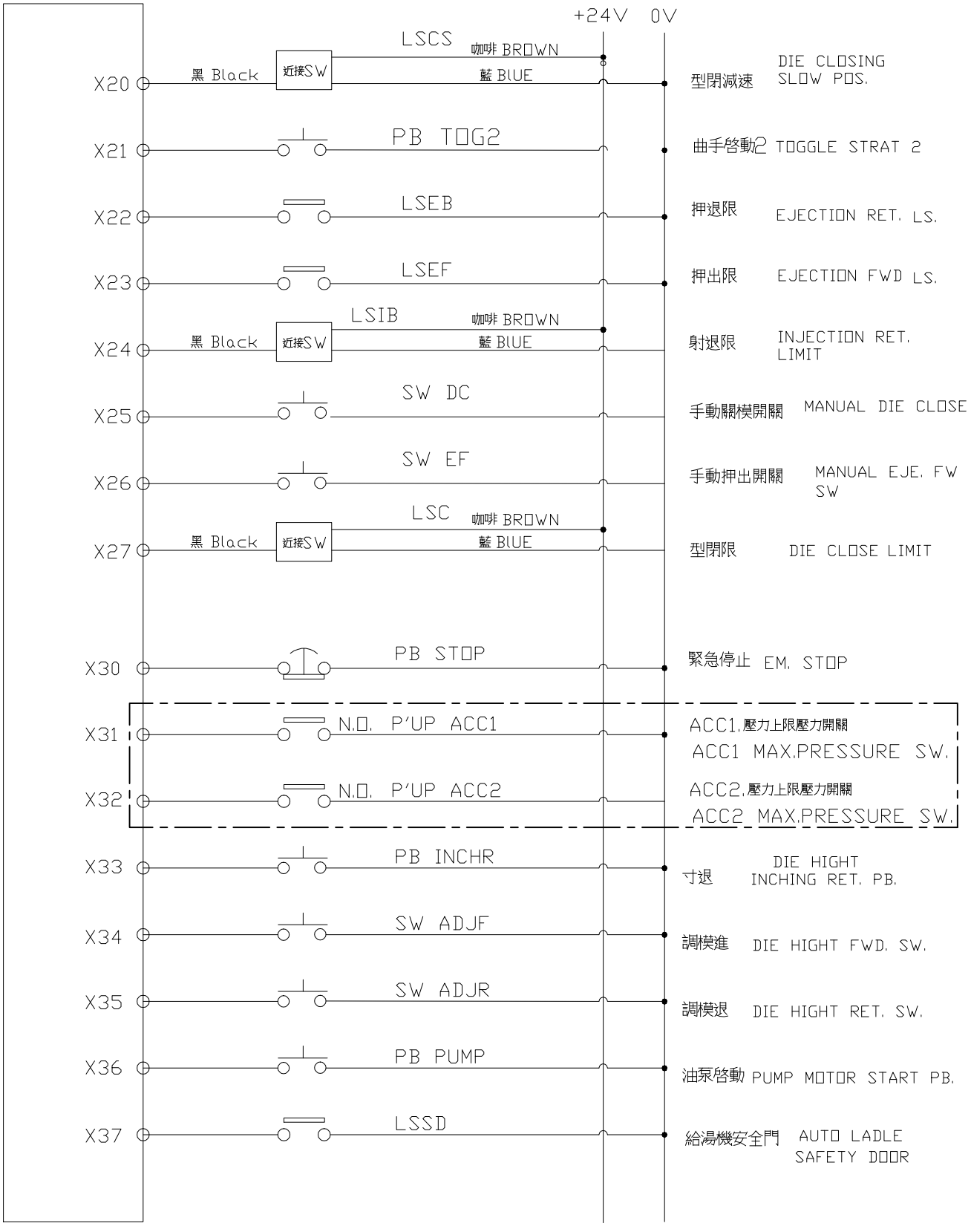
PLC AX2N-128MT+AX2N-16EX+AX2N-16EX+8EY+AX2N-4DA+AX2N4AD+AX2N-2AD

2011年版	第1頁		
I.O表	A-01		
圖名	圖號		
投影	F		
比例	日期	2011/07/25	
mm		1	
單位	材質	數量	

永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型 V4N全面對接電調

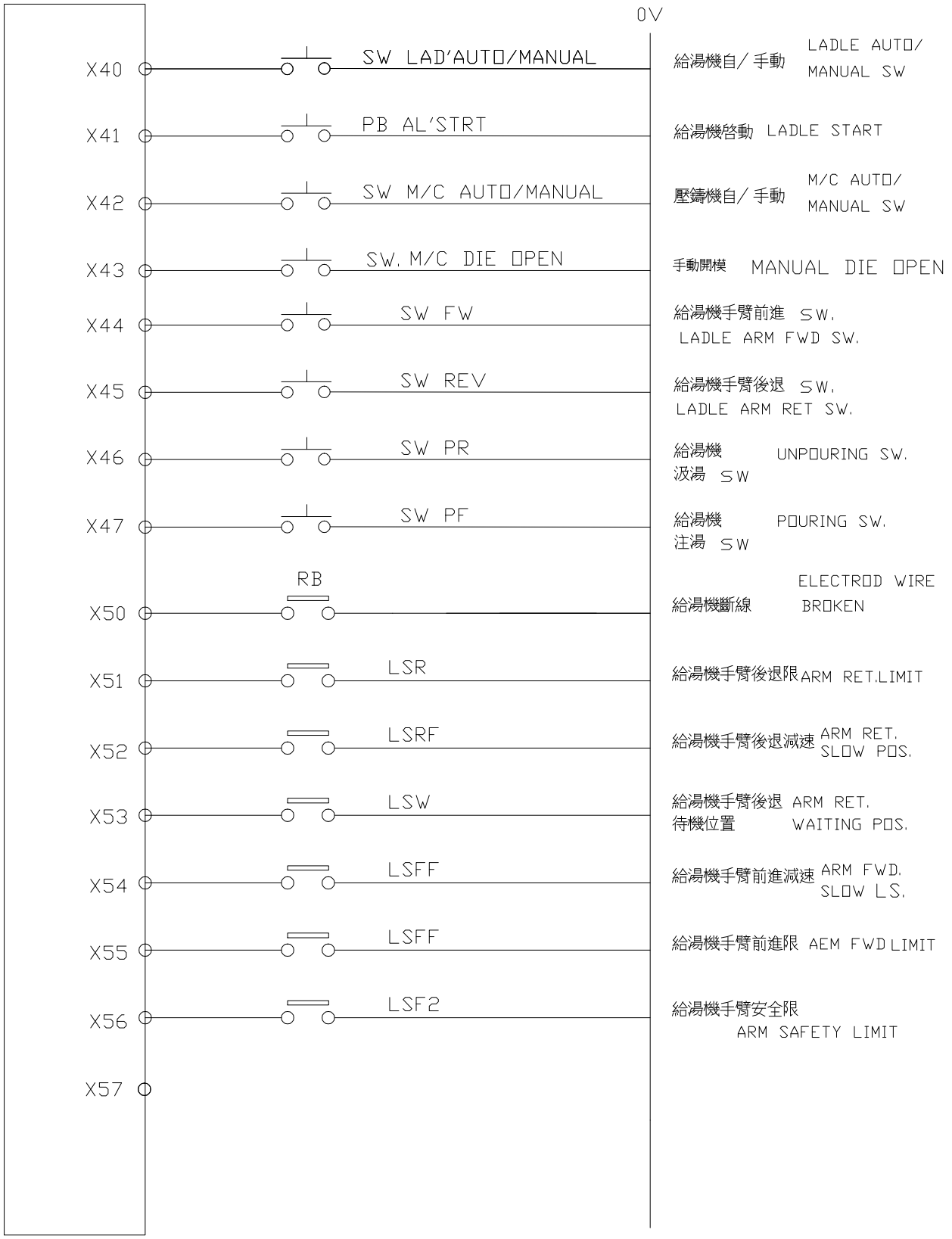
核準	檢圖	設計



2011年版	第1頁				
I.O表	A-02				
圖名	圖號				
投影	比例	F			
日期	2011/07/25				
mm		1			
單位	材質	數量			

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

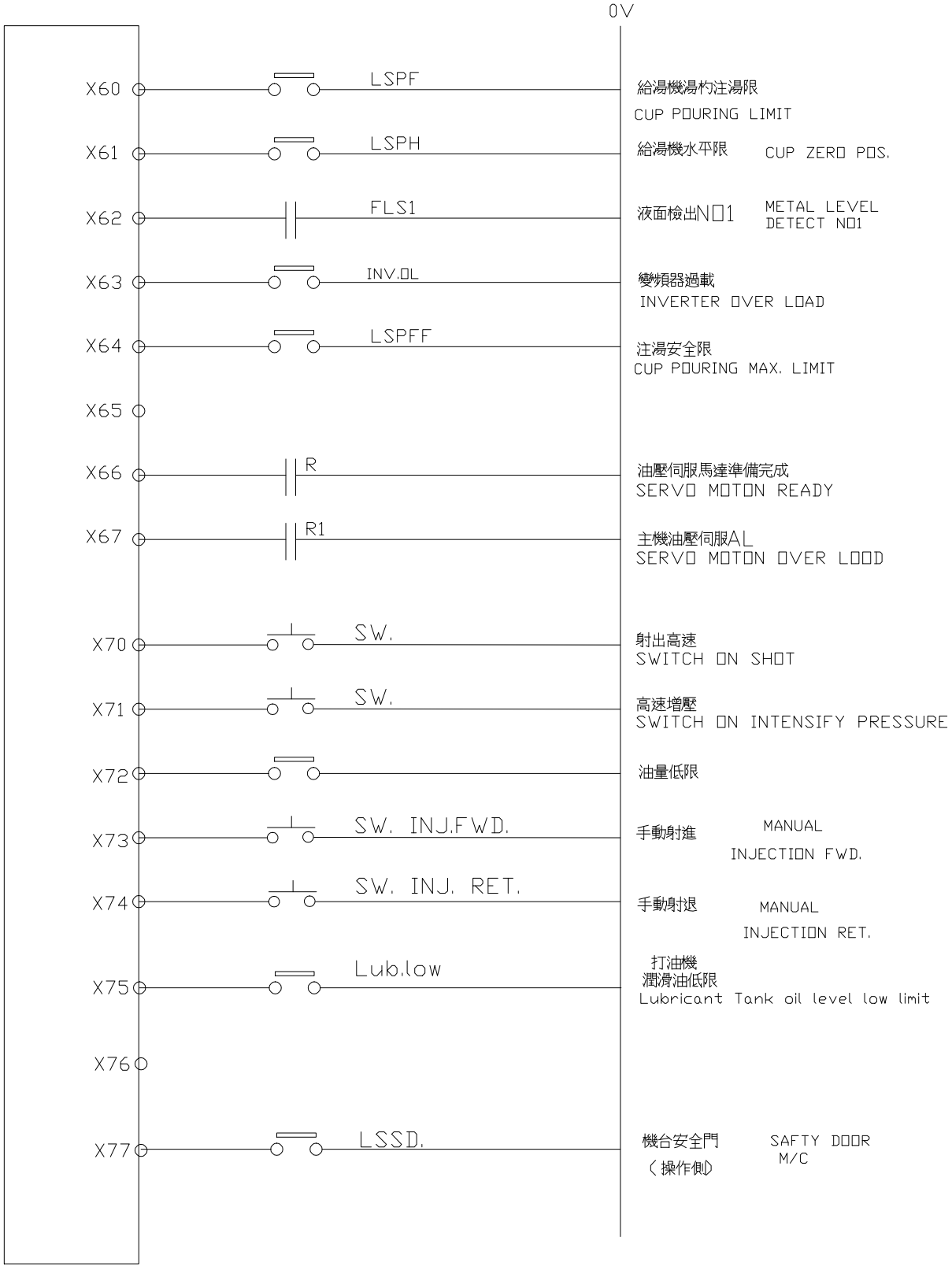
機型	V4N全面射速電調		
核准	檢圖	設計	



2011年版	第1頁				
I.O表	A-03				
圖名	圖號				
	F				2011/07/25
投影	比例				日期
mm					1
單位	材質				數量

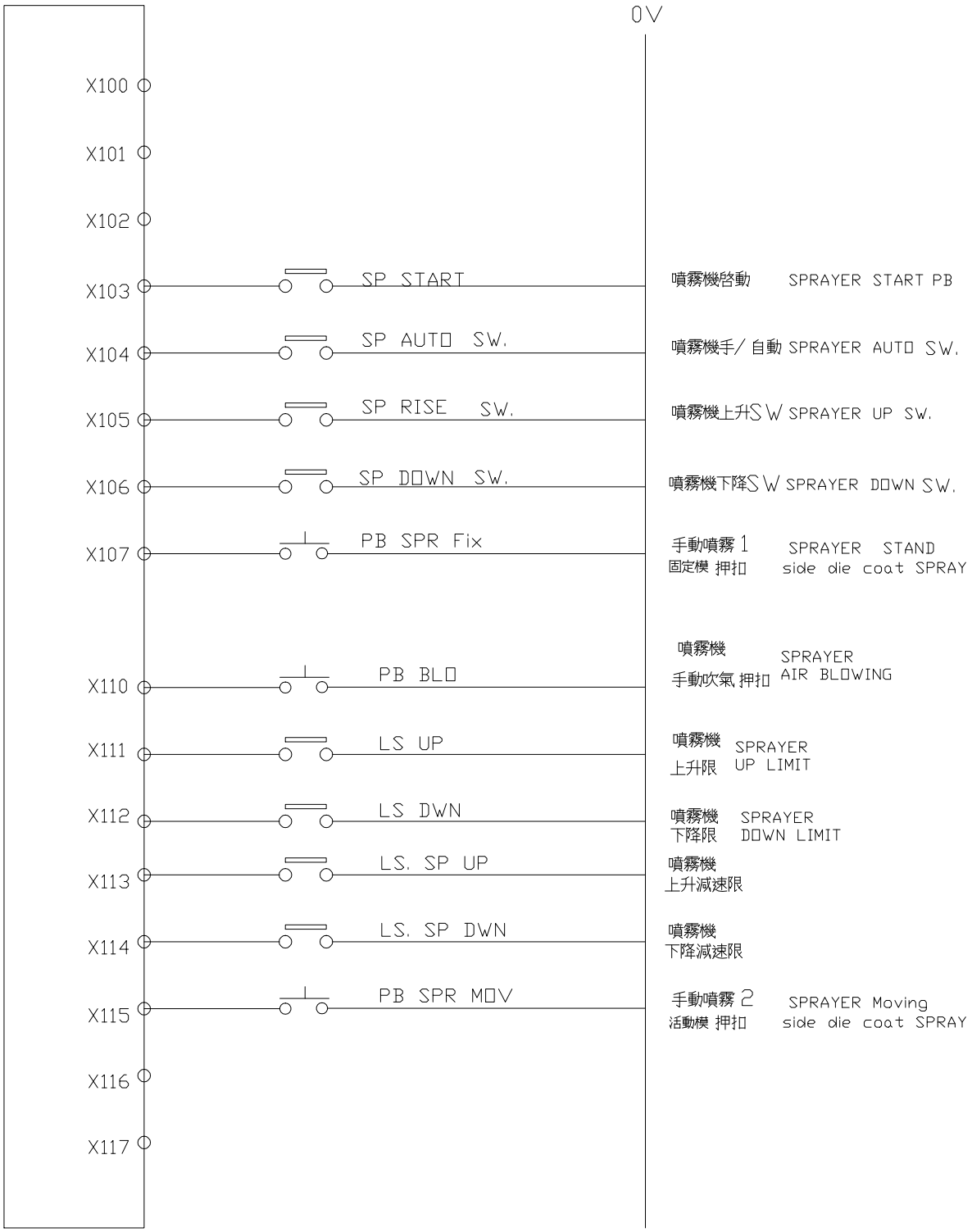
永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型	V4N全面對接電調	
核准	檢圖	設計



2011年版	第1頁						
I.O表	A-04						
圖名	圖號						
投影	比例	日期					
	F	2011/07/25					
單位	材質	數量					
mm		1					
永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.							
機型	V4N全面射速電調						
核準	檢圖	設計					

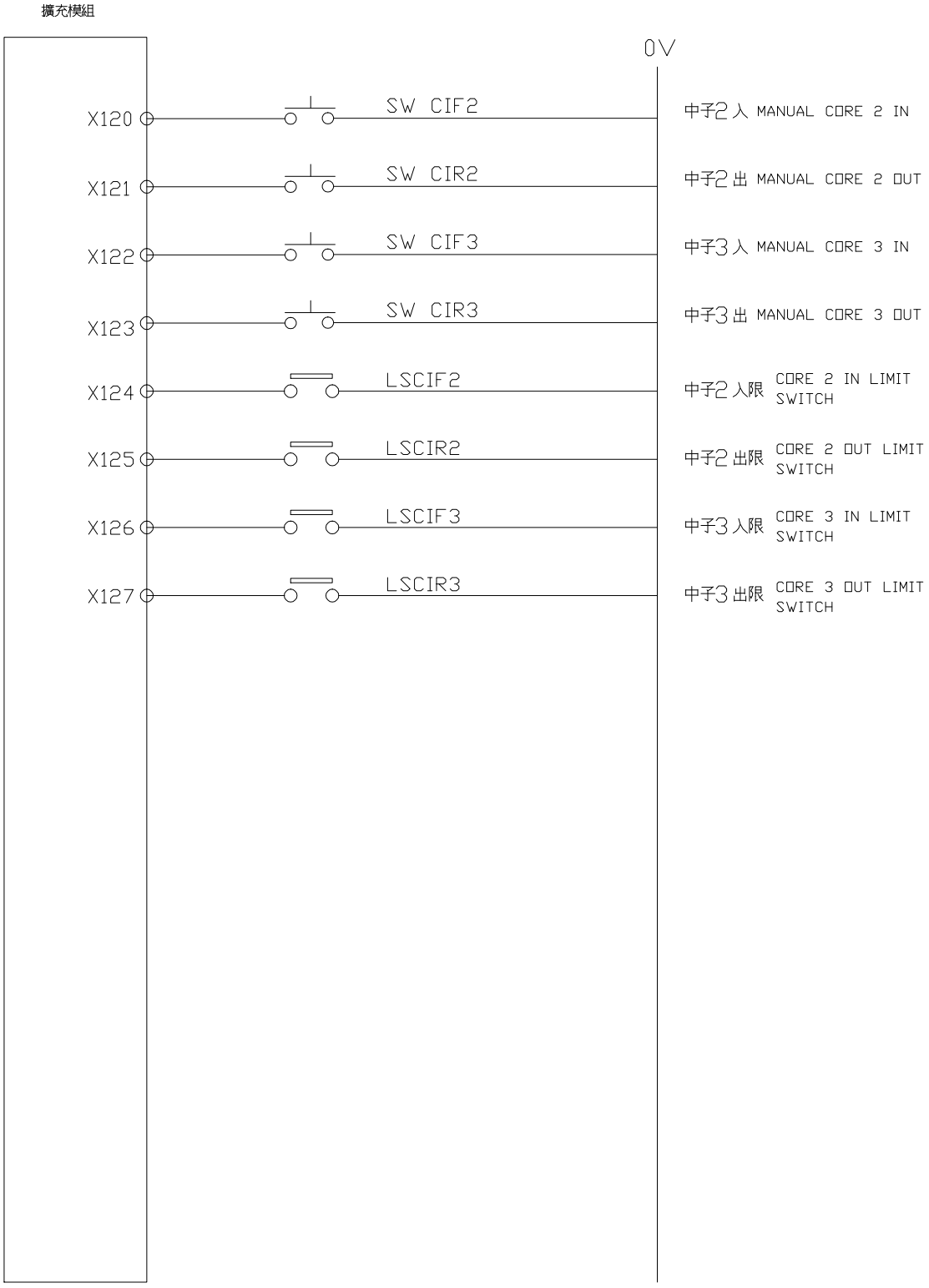
擴充模組



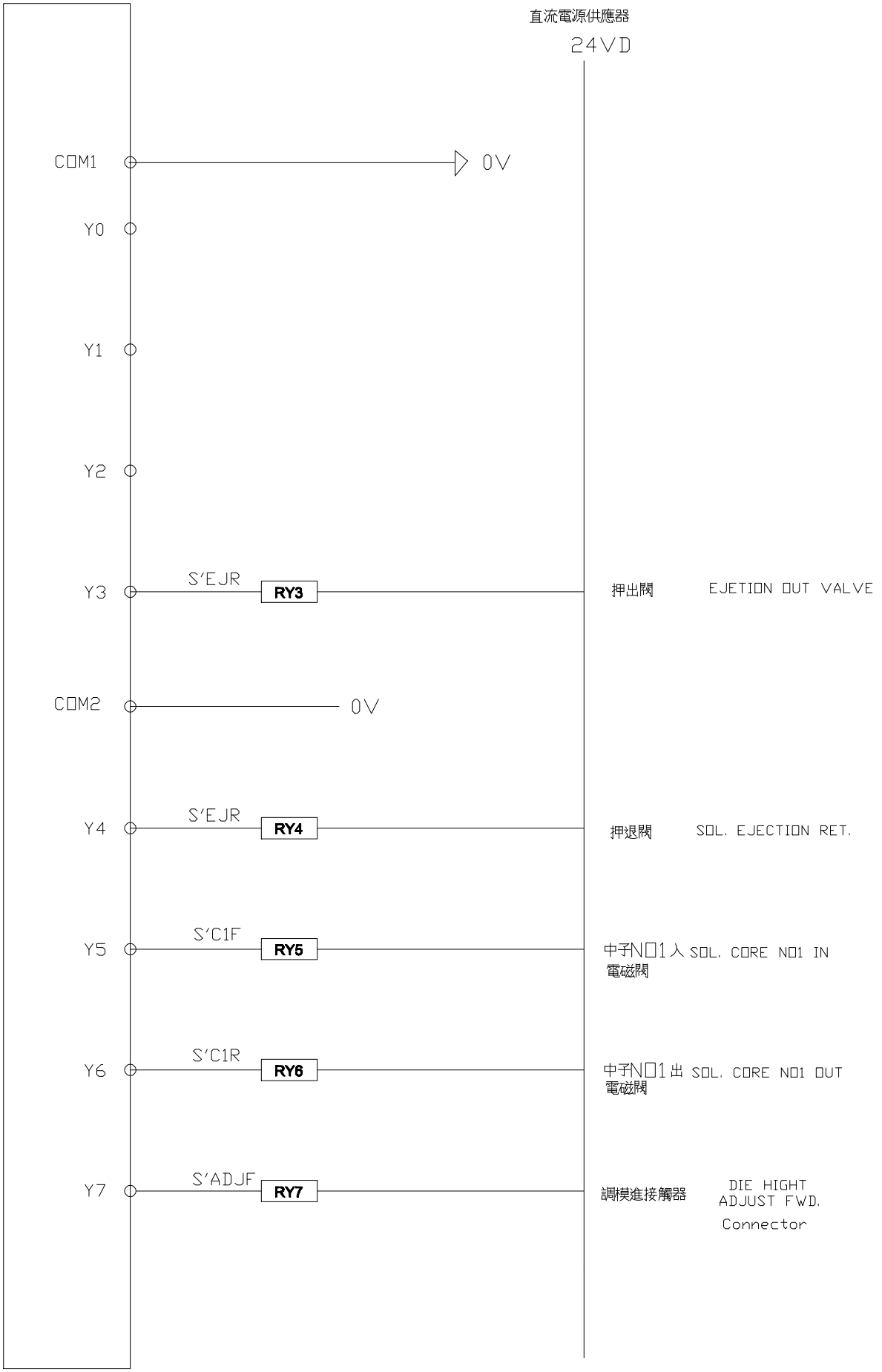
2011年版	第1頁					
I.O表	A-05					
圖名	圖號					
投影	比例	F	日期	2011/07/25		
單位	mm		數量	1		
材質						

永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型	V4N全自動接電調		
核準	檢圖	設計	



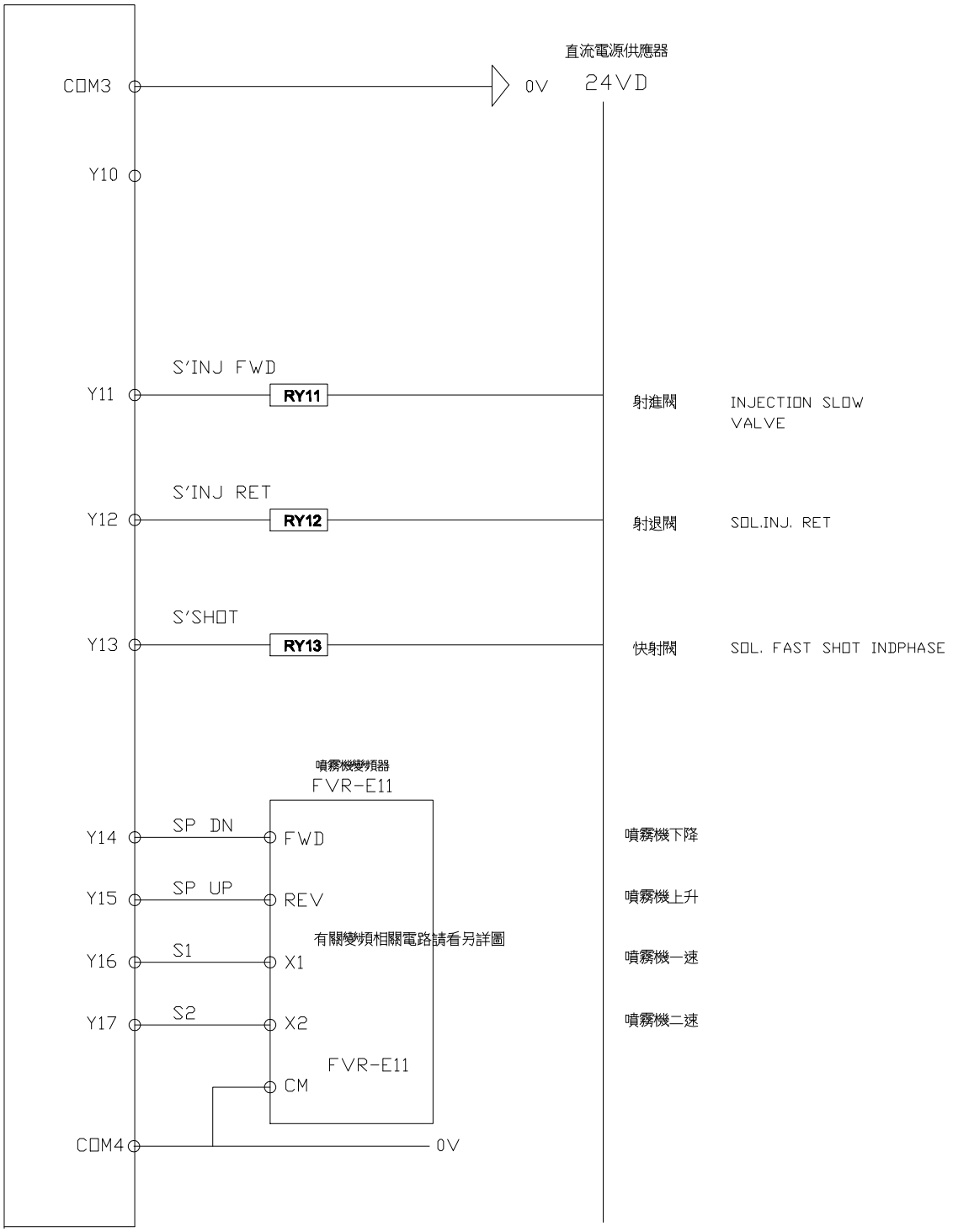
2011年版	第1頁						
I.O表	A-05						
圖名	圖號						
投影	比例	F	2011/07/25				
單位	材質	數量					
mm		1					
機型	V4N全電動接電調						
永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.							
核準	檢圖	設計					



2011年版	第1頁						
I.O表	A-06						
圖名	圖號						
		投影		F			
		比例			日期	2011/07/25	
mm					1		
單位	材質				數量		

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

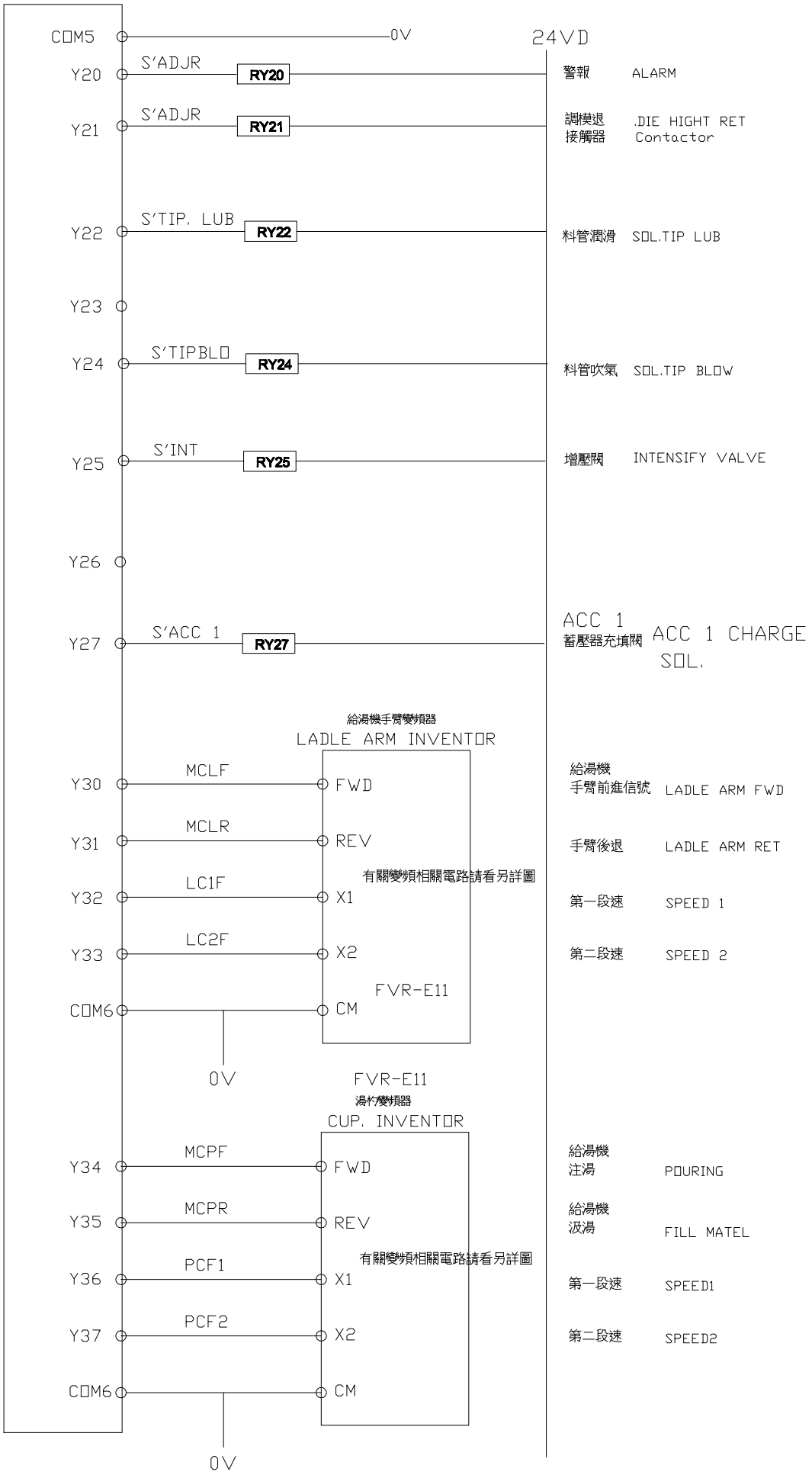
機型	V4N全面對接電調		
核準	檢圖		設計



2011年版	第1頁				
I.O表	A-07				
圖名	圖號				
	F				2011/07/25
投影	比例				日期
mm					1
單位	材質				數量

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

機型	V4N全面對接電調
核準	
檢圖	
設計	

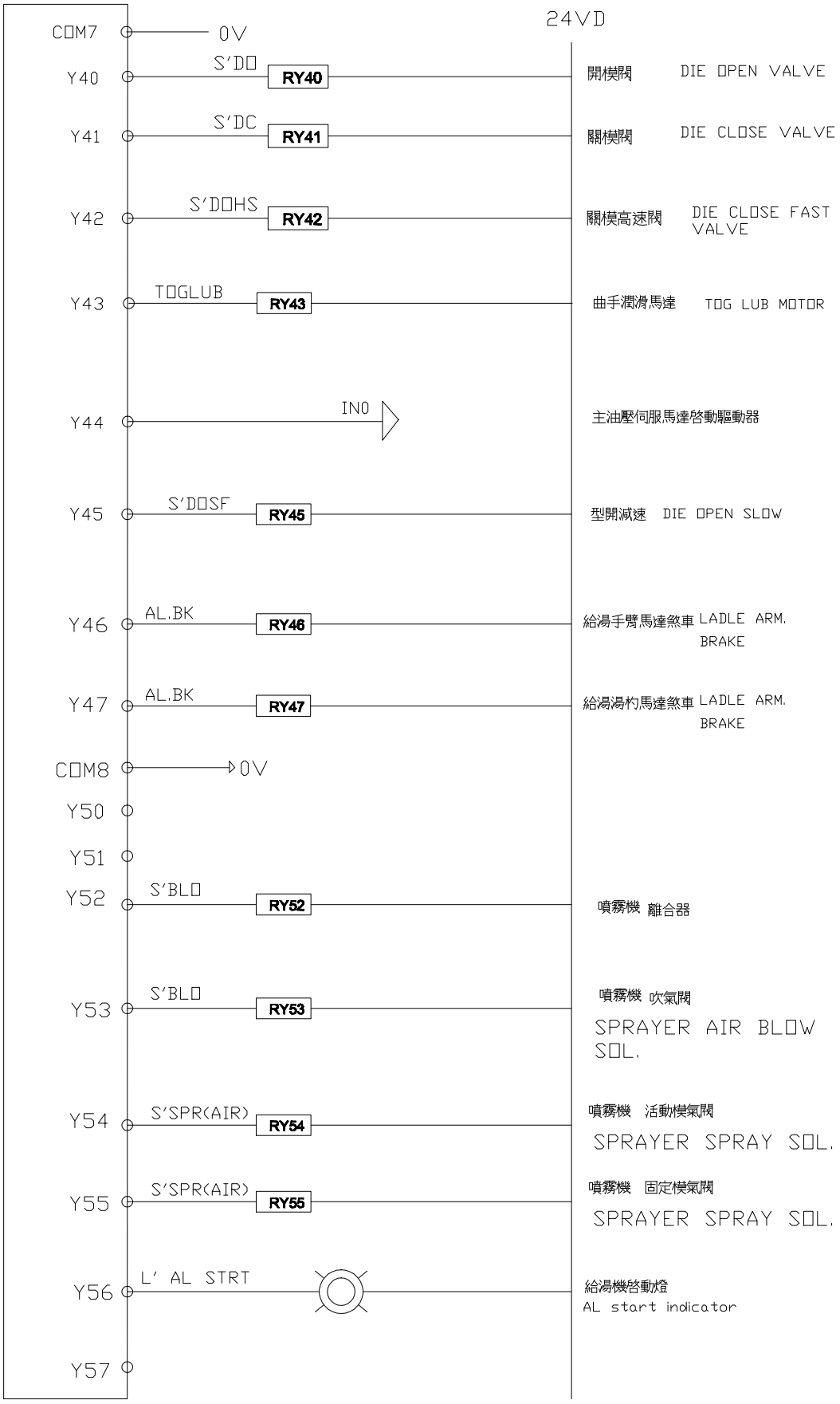


2011年版	第1頁				
I.O表	A-08				
圖名	圖號				
		投影	比例	日期	
			F	2011/07/25	
		mm		1	
		單位	材質	數量	

永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型 V4N全面對接電調

核準	檢圖	設計

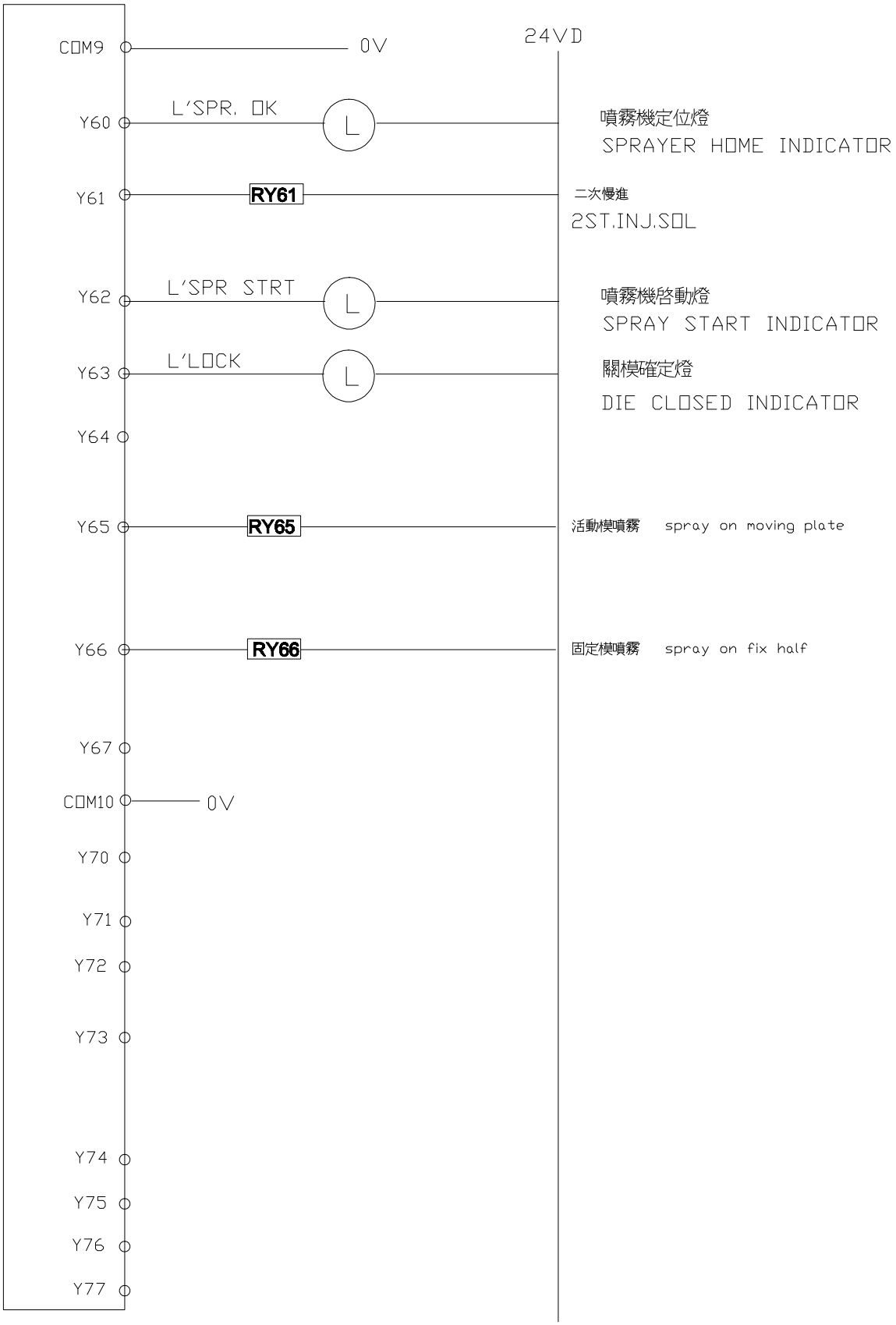


2011年版	第1頁				
I.O表	A-09				
圖名	圖號				
投影	比例	F	日期	2011/7/25	
mm			1		
單位	材質		數量		

永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型 V4N全面對接電調

核準	檢圖	設計

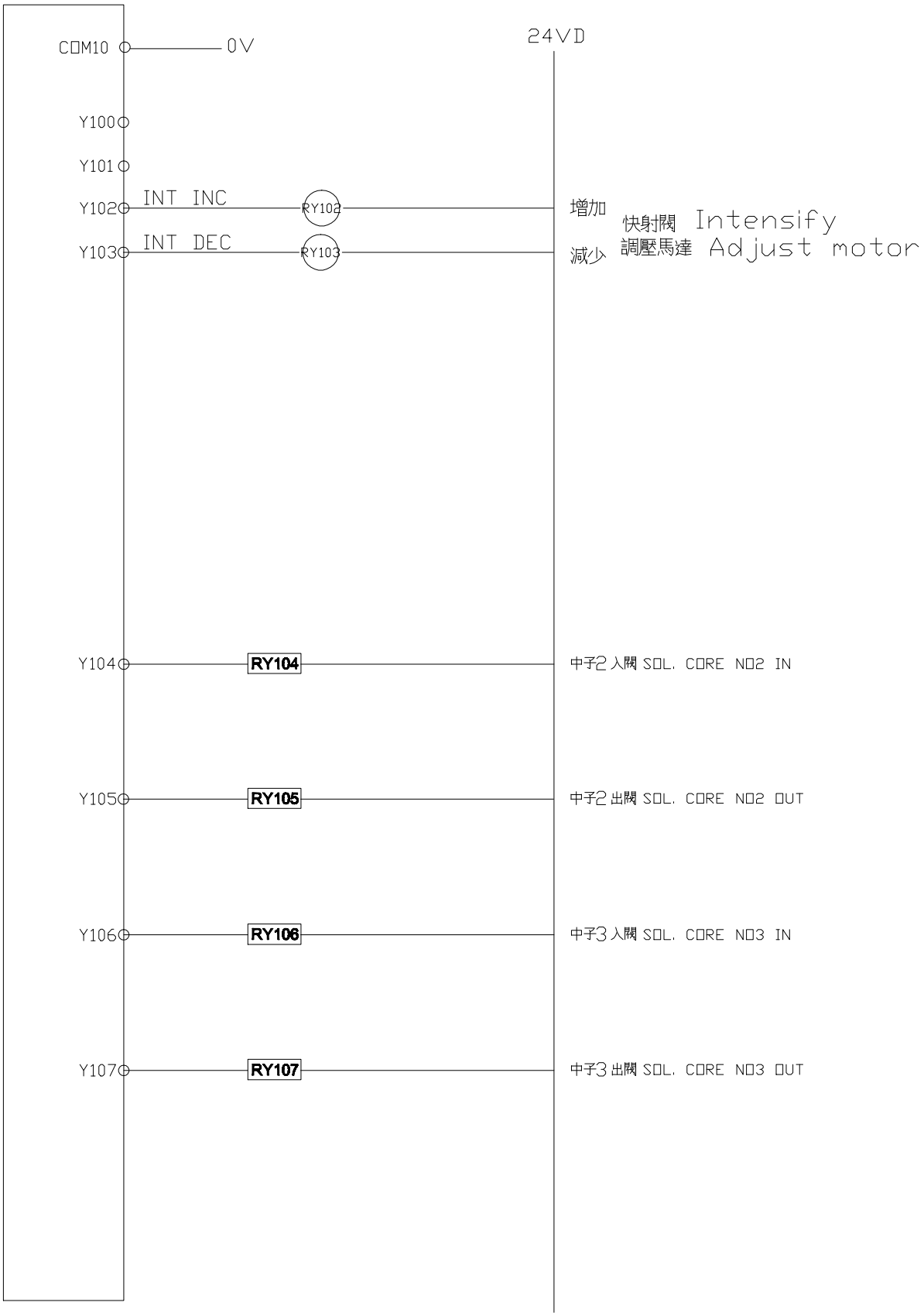


2011年版	I.O表	A-10	第1頁		
圖名		圖號			
			投影	比例	日期
				F	2011/07/25
單位	材質	數量			
mm		1			

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

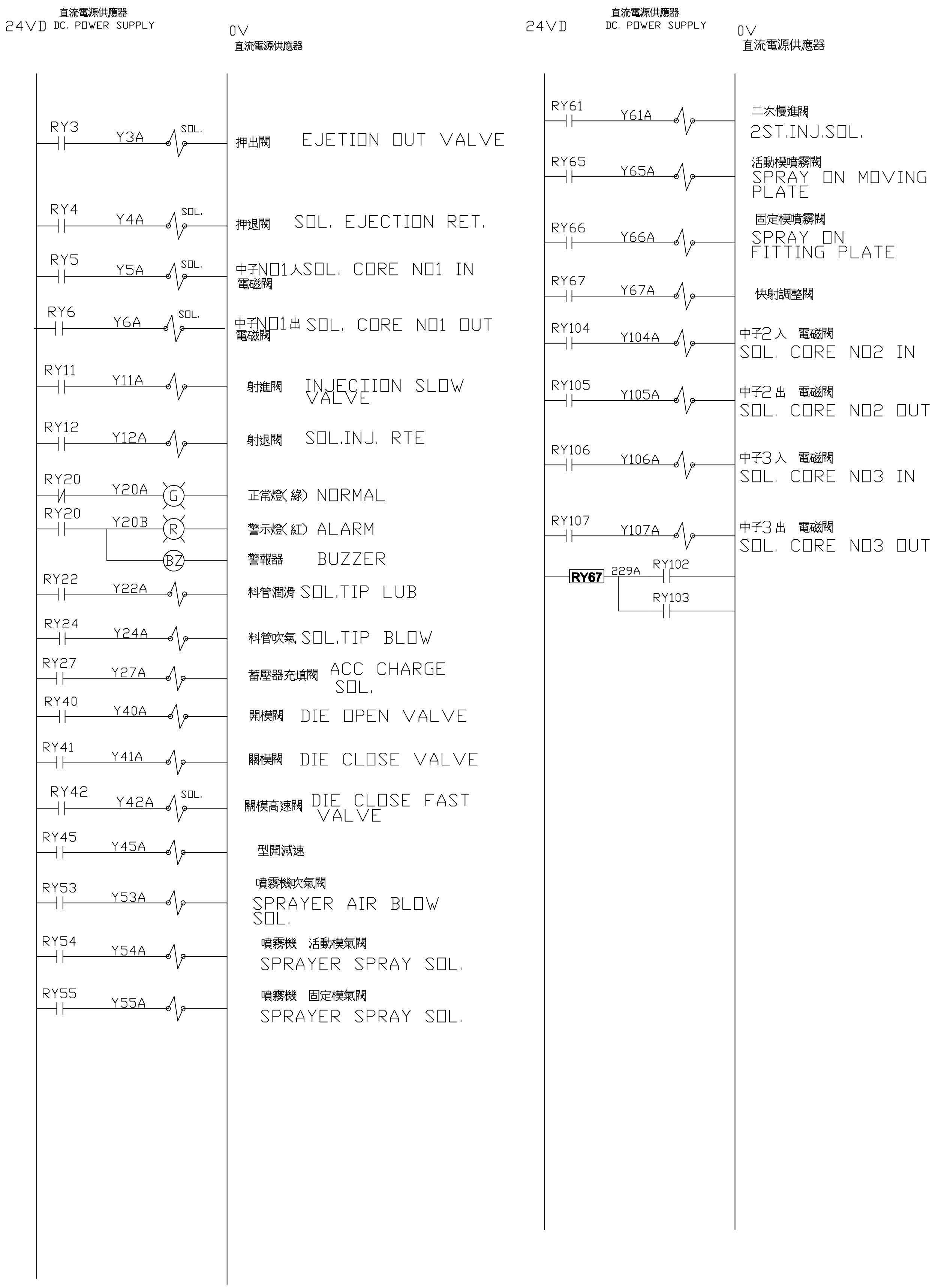
機型 V4N全面對拉電調

核準	檢圖	設計



2011年版	第1頁						
I.O表	A-10A						
圖名	圖號						
投影	比例	F					
日期	2011/07/25						
單位	mm						
材質							
數量	1						
永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.							
機型	V4N全電射接電調						
核準							
檢圖							
設計							

※負載將繼電器二組接點並聯使用



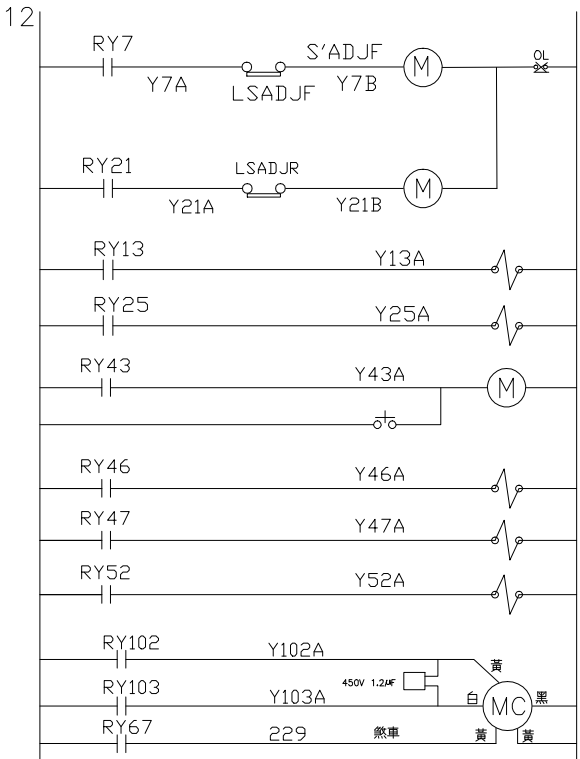
2011年版	第1頁
圖名	I.O表
圖號	A-11
單位	mm
投影	⊕◫
比例	F
材質	
數量	1
日期	2011/07/25

永鈦機械股份有限公司 EVERGREAT DC MACHINE CO., LTD.

機型: V4N全配射速電調

校準 / 檢圖 / 設計

※負載將繼電器二組接點並聯使用

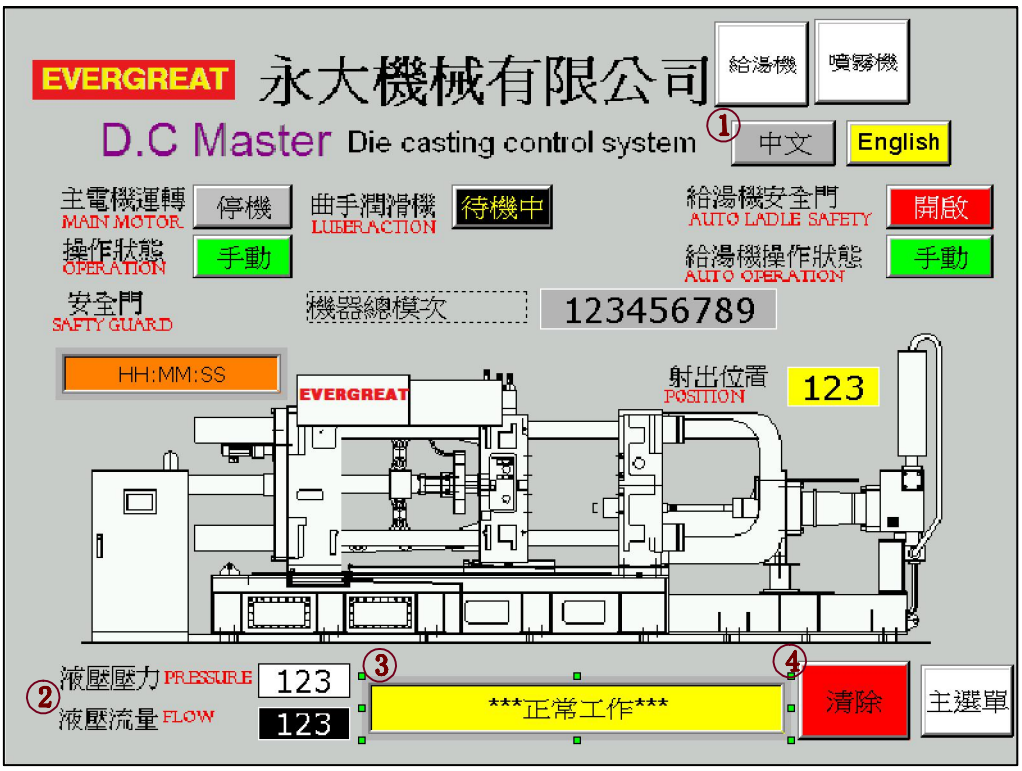


※三只電容器裝在控制箱內

2011年版	第1頁				
I.O表	A-12				
圖名	圖號				
	F			2011/07/25	
投影	比例			日期	
mm				1	
單位	材質			數量	

永鈦機械股份有限公司
EVERGREAT DC MACHINE CO., LTD.

機型	V4N全面對接電調		
核準	檢圖		設計

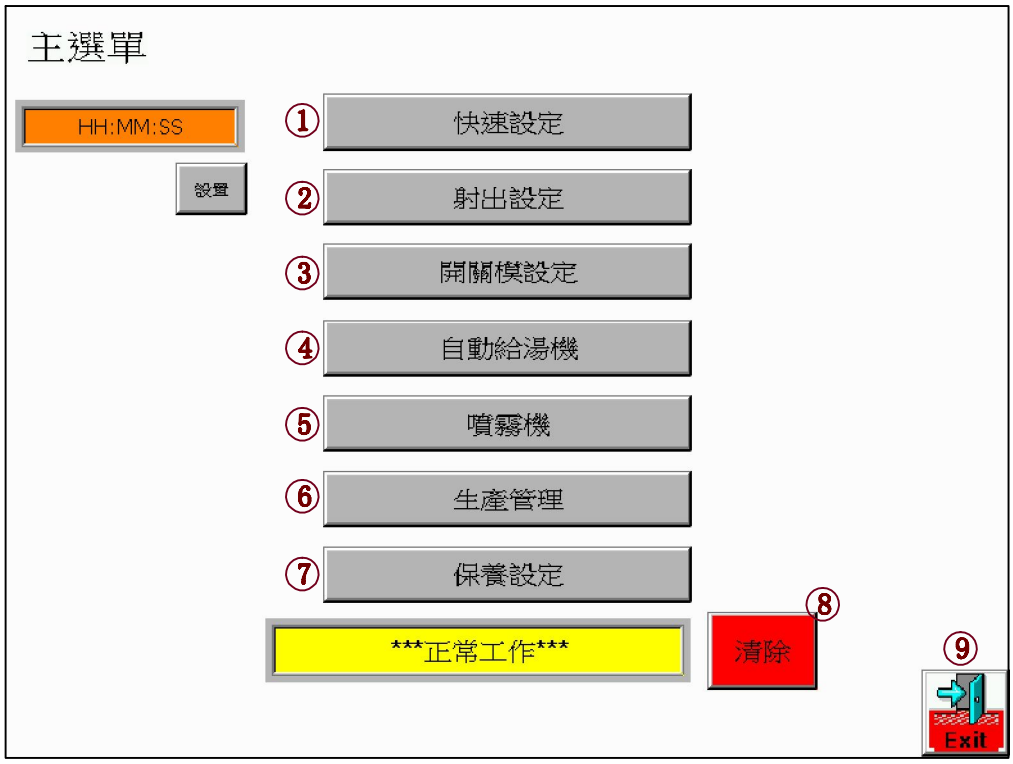


1. 語言設定按鈕

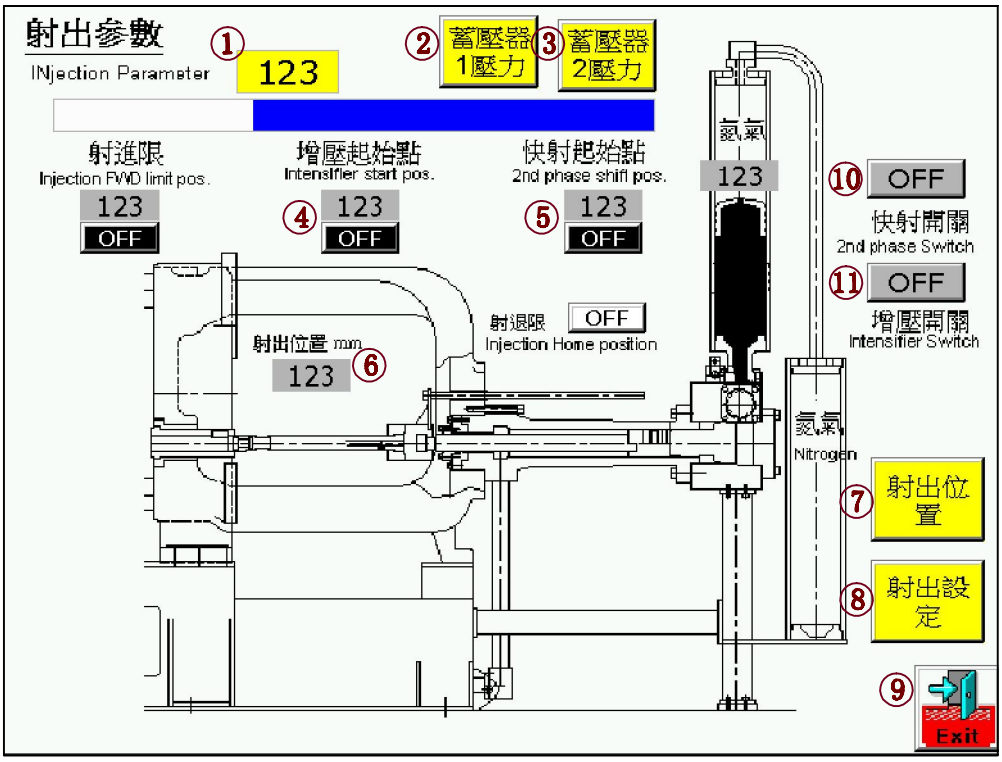
2. 現在的壓力和流量

3. 異常信號，觀看目前異常狀況

4. 清除異常信號按鈕



1. 快速設定按鈕
2. 射出設定按鈕
3. 開關模設定按鈕
4. 自動給湯機按鈕
5. 噴霧機按鈕
6. 生產管理按鈕
7. 保養設定按鈕
8. 錯誤信號清除
9. 切換到主目錄



1. 射出目前位置顯示

2. 蓄壓器壓力1監看設置按鈕

3. 蓄壓器壓力2監看設置按鈕

4. 增壓啟動位置點設置

5. 快射啟動位置點設置

6. 射出位置(目前)

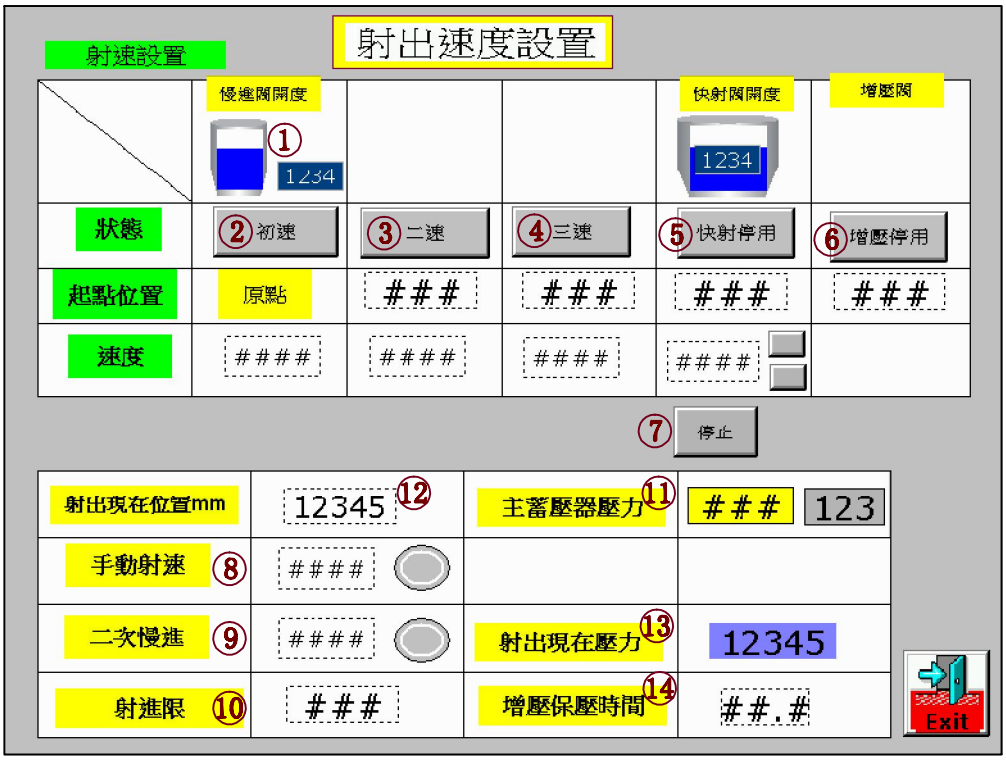
7. 射出位置設定按鈕

8. 換頁至射出設定頁

9. 切換到主目錄

10. 快射功能 使用/不使用 切換開關

11. 增壓功能 使用/不使用 切換開關



1. 慢進閥設置位置值

2. 初段的速度設置, 可以設慢點, 使射出啟動振動減小

3. 二段的速度設置, 這是推料進入模腔的速度

4. 第三段速度, 這段速度是切換到高速射料的前段速度, 可以稍微快些, 增加快射的加速性

5. 7. 快射啟始點以及快射速度調整, 設入數值後按壓(7)鍵, 電子控制閥自動調整到所需速度, 指示燈會熄滅

6. 增壓位置點設置

8. 手動射進速度設置

9. 二次慢進速度設置, 射出後完成冷卻, 模具打開時柱塞頭(plunger)會跟開模同步推出料餅, 這個速度由這裡調整

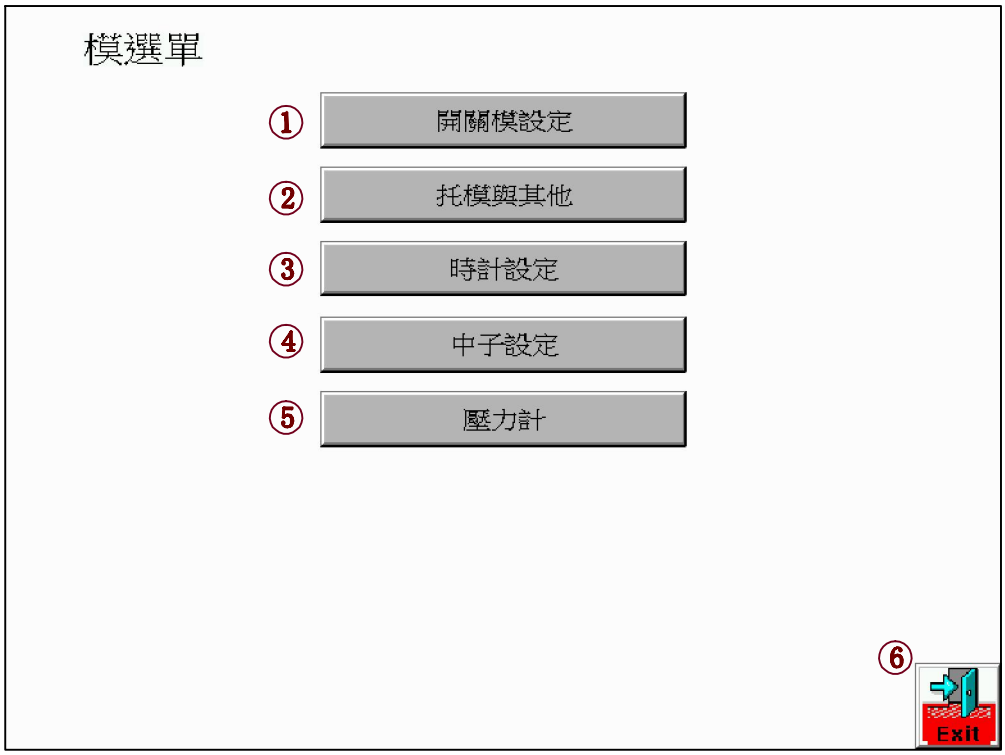
10. 射進限, 射出最突出點, 亦即自動模式下, 柱塞頭跟出的最外點

11. 主蓄壓器壓力, 設置最高140kg/cm^2

12. 現在位置, 作為參數目前柱塞頭推進的當前位置

13. 射出進行時, 偵測油缸內的壓力

14. 增壓射出時, 高壓保持壓力的時間



1. 換頁面到開關模設定頁

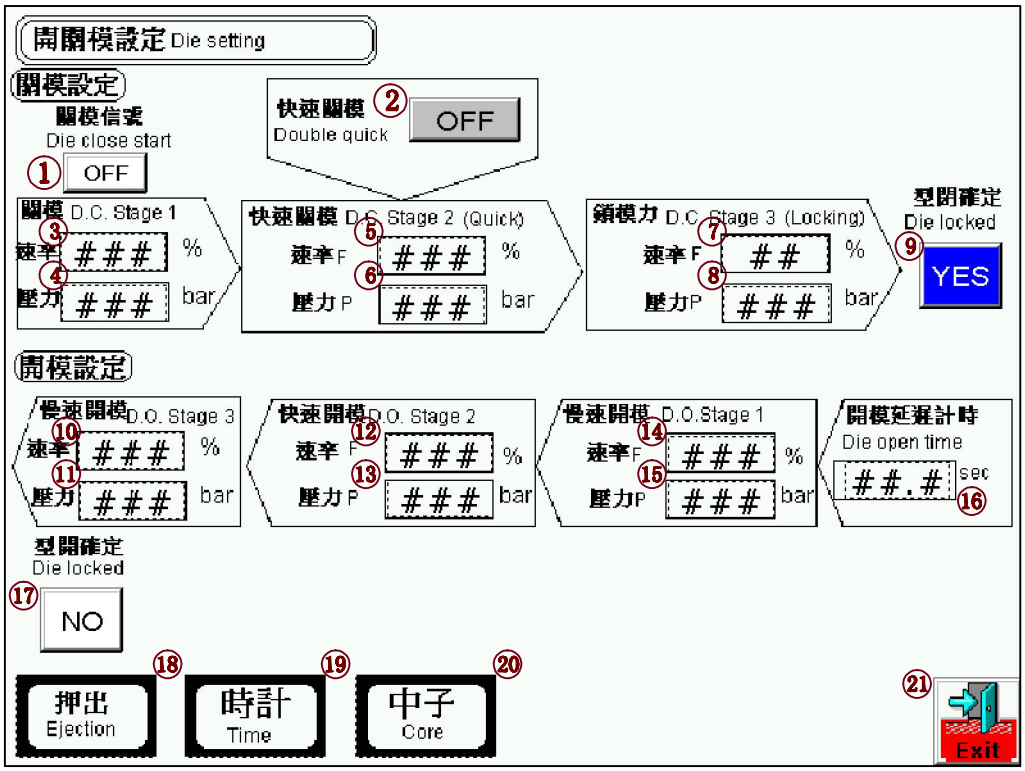
2. 換頁面到脫模與其他設定頁

3. 換頁面到時計設定頁

4. 換頁面到中子設定頁

5. 換頁面到壓力計設定頁

6. 切換到主目錄



1. 關模信號指示燈

2. 快速關模使用開關切換

3. 4. 關模動作第一段啟動的壓力、流量

5. 6. 關模動作第二段啟動的壓力、流量

7. 8. 關模鎖緊的壓力、流量

9. 型閉確定指示燈

10. 11. 開模末段的壓力、流量，此項數值不宜設置過大，避免開模震動過大

12. 13. 開模中斷的壓力、流量

14. 15. 模初段的壓力、流量，開模初始時要考慮柱塞頭跟出力此項不宜設置過大，避免震動

16. 開模延遲計時，亦即冷卻計時，射出完了延遲冷卻計時到了再開模

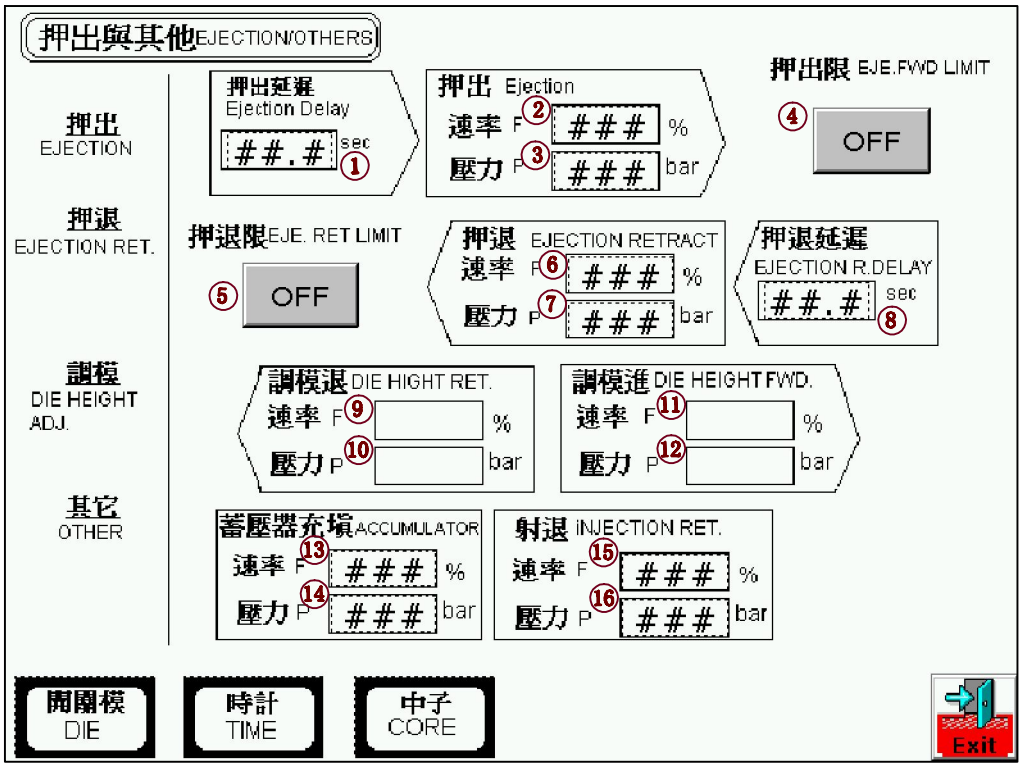
17. 型開確定指示燈

18. 換頁面到押出設定頁

19. 換頁面到時計設定頁

20. 換頁面到中子設定頁

21. 切換到主目錄



1. 押出延遲:當在自動模式下機台開模到位後，會開始計算此時間，才進行押出

2. 3. 設定押出的速率值跟壓力值

4. 押出限指示燈

5. 押退限指示燈

6. 7. 設定押退時的速率值跟壓力值

8. 押退延遲:當押出限碰到後，開始計算此時間，計時到才開始押出退回

9. 10. 設定調模退時的速率值跟壓力值(通常不調)

11. 12. 設定調模進時的速率值跟壓力值(通常不調)

13. 14. 蓄壓器充填速率值跟壓力值，注意此壓力值需大於欲設定的蓄壓器壓力值10kg-cm^2 以上

15. 16. 射桿射退的速率值跟壓力值

1. 開模計時:使產品於模內冷卻之時間

2. 射退延遲:設定射桿在跟出後到射退的延遲時間

3. 押出延遲:開模到位後押出閥延遲的時間

4. 押退延遲:押退閥延遲之時間

5. 現在模數:顯示現在工作模數值

6. 模數設定:預設模數到位後，機器會暫停並發出“生產數已到”的警報

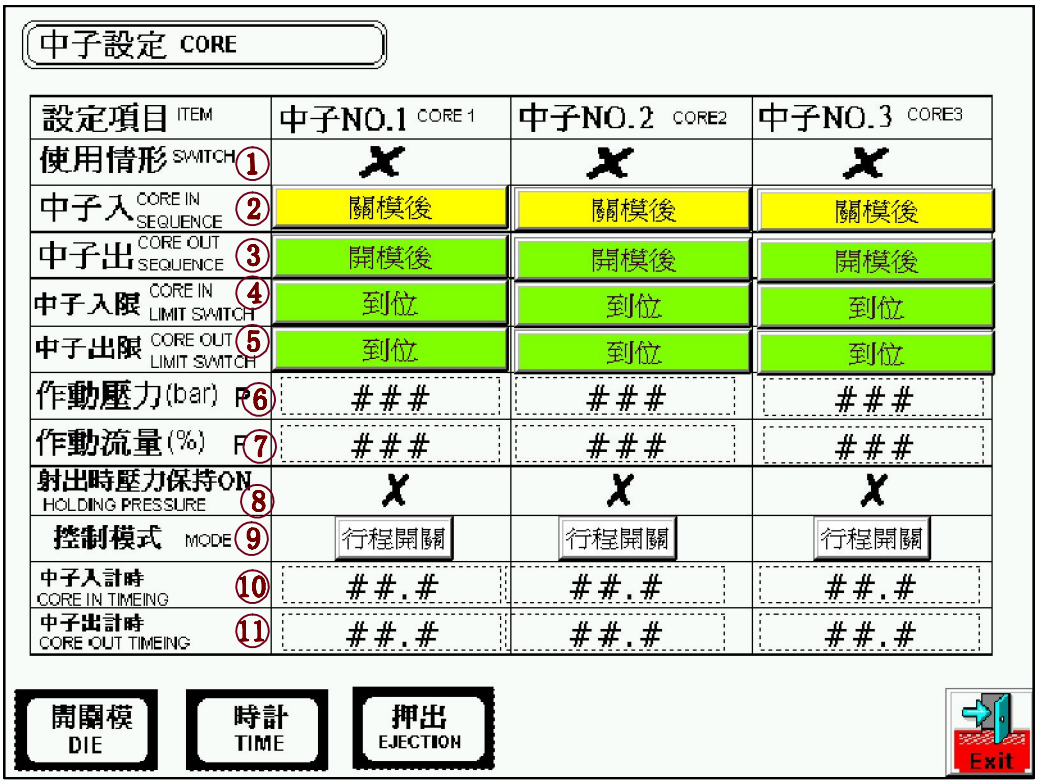
7. 料管潤滑模數:設定料管潤滑打油幾模作動一次

8. 料管吹氣計時:料管作動時吹氣的時間

9. 週期計時:顯示當前生產一模的時間值

10. 曲手潤滑間隔:設定曲手潤滑所需的模數,亦即在設定模數達到同時開始曲手潤滑打油

11. 打油潤滑的時間,需注意供油需能完全到達每一個潤滑點



1. 中子使用與不使用切換開關

2. 中子入順序選項擇，分關模前與關模後入中子，“關模前”模式是中子先插入，到位後再進行關模，“關模後”則是完成關模後再插入中子

3. 中子出順序選項擇，分“開模前”與“開模後”兩種模式，“開模前”是中子先抽出再接開模動作，“開模後”是開模完成後再中子抽出

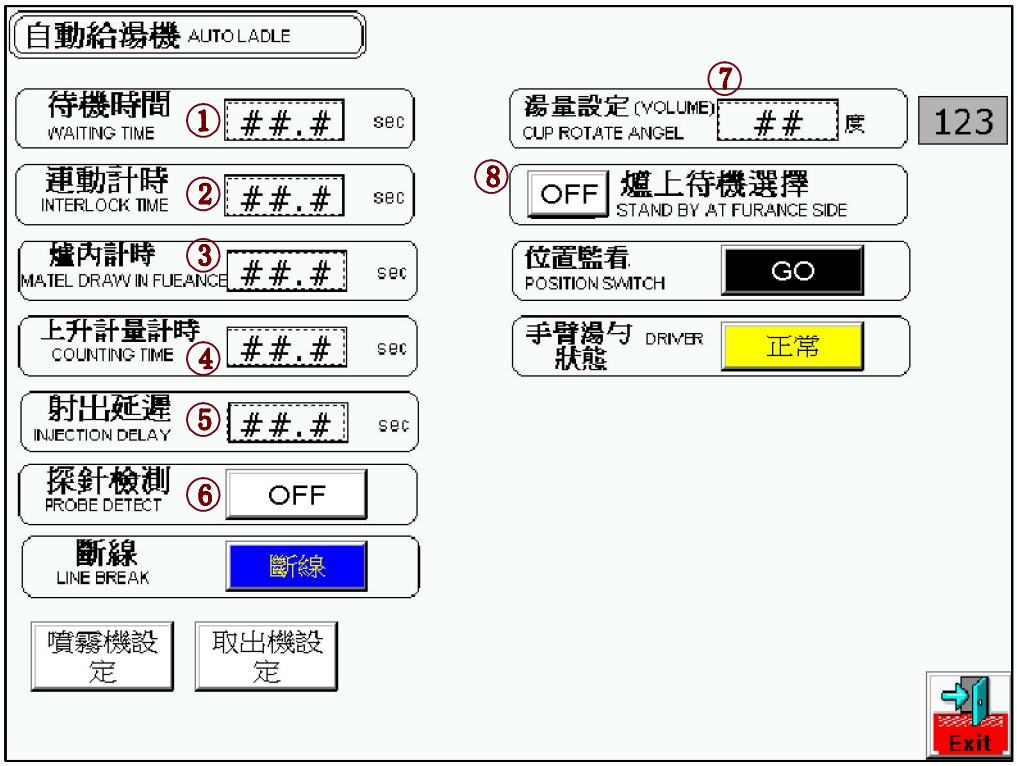
4. 5. 中子入限、中子出限到位指示，中子限位元開關接線須接在常閉接點上，即中子開關到位即斷電，到位指示會顯出，

6. 7. 中子抽插的作動壓力與流量（速度）設置

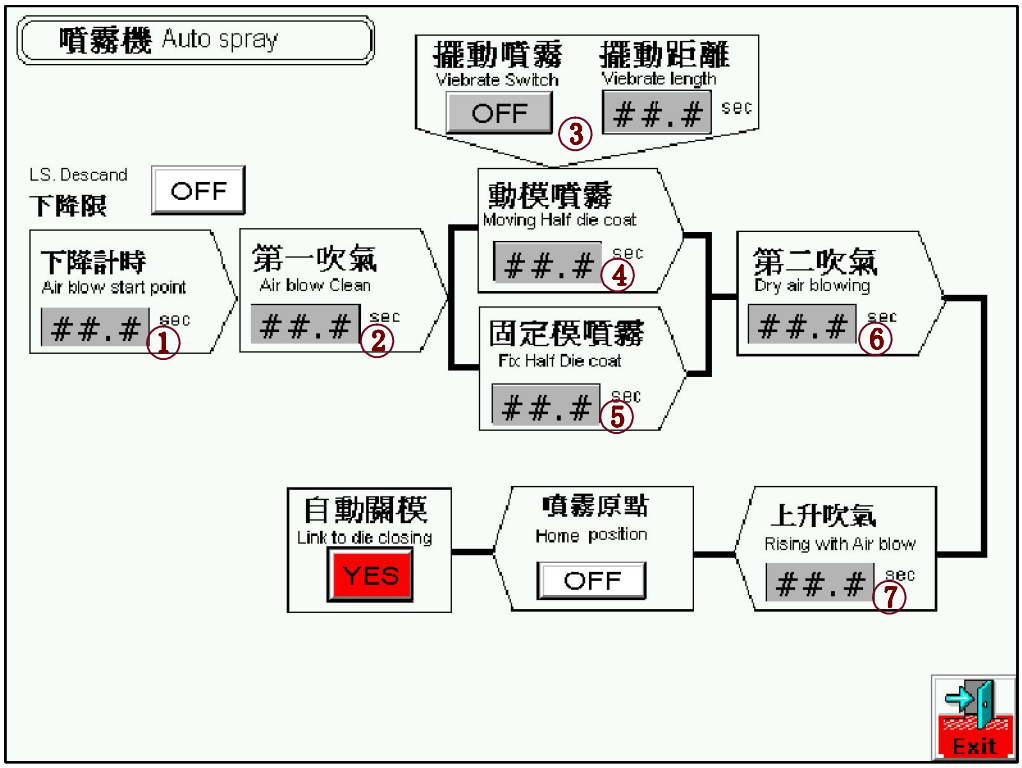
8. 射出時若中子需保壓請選擇ON，但注意中子油缸是無法完全抵擋射出力的反壓，會有退後的情況發生

9. 控制模式選擇：提供“行程開關”與“時間控制”兩種模式，注意：“時間”模式只應用在短期試模時使用，因為時間控制中子油缸動作無法檢出是否有確實作動到位，易發生誤動作。相對的“行程開關”較為安全，開關未到位，不會接續到下一次動作。

10. 11. 中子入、出時間，選擇“時間”模式時，中子出與入的作動時間



1. 給湯待機計時，料杓汲湯之後若機器完成開模與射退限到位就會注湯，
   但等待這個時間設定到達，就返回爐上換料
2. 連動計時，與機器作動及操作者的作業速度作協調而調整，時間越短，
   給湯頻數越快
3. 爐內計時，在爐內舀湯停留的時間，做為與大、小料杓進料時間不同的設置
4. 上升計量，舀完湯後於爐內傾杓上升，保持料量一致
5. 射出延遲，在料管處注湯完成轉接到射出信號的間隔時間
6. 探針線狀態指示
7. 湯量角度設置,角度愈大,取料愈大
8. 給湯待機選擇，爐上待機跟料管待機,"ON"狀態為爐口待機,給湯機取湯後在爐口等待開模
   完成信號即前進倒料,"OFF"狀態為取湯後,前進到料管邊等待開模完成的信號



1. 下降計時，達設定時間後即噴霧

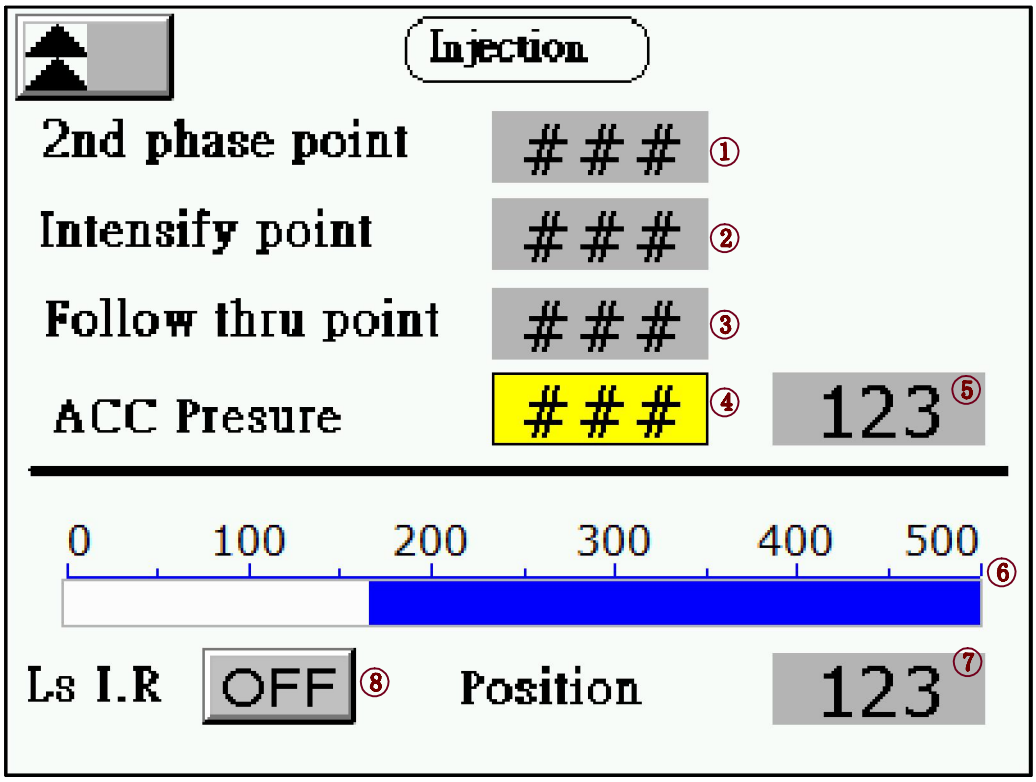
2. 吹氣1計時，用於第一段清掃吹除模具面的毛邊及雜物

3. 擺動噴霧，使用擺動噴霧及在噴模具面時會上下擺動, 進行較面積噴塗

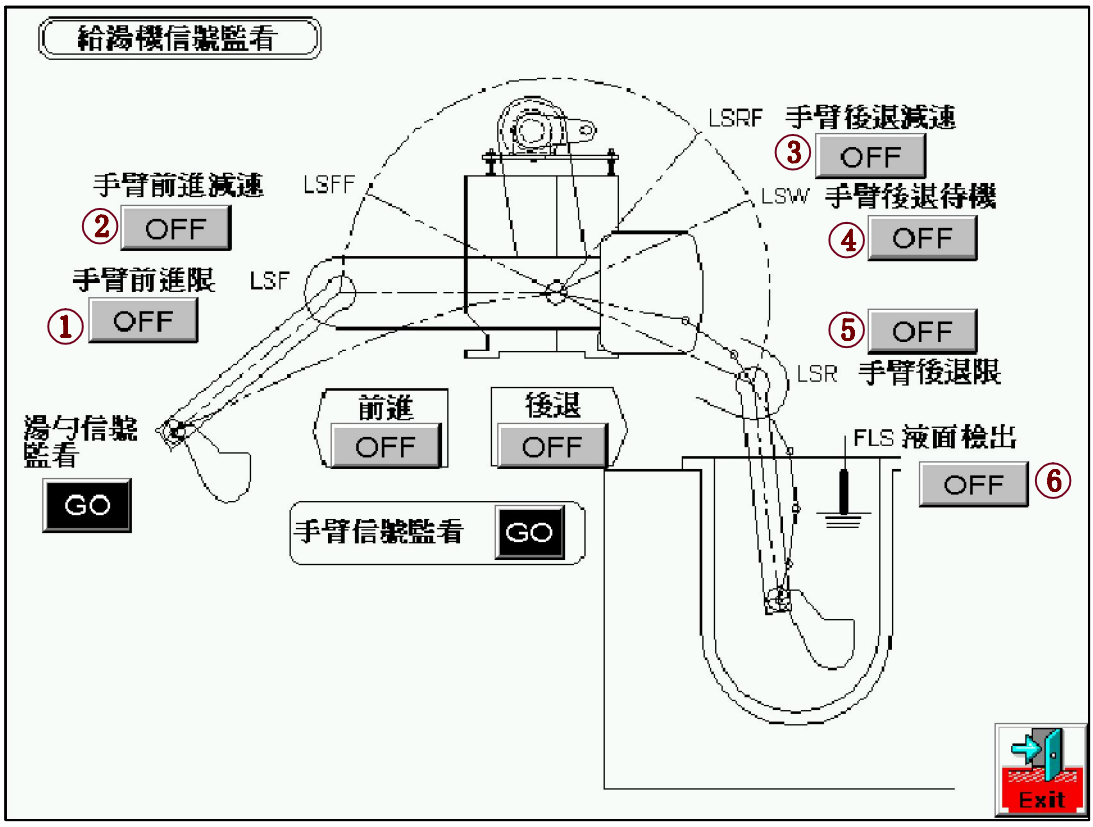
4. 5. 活動模/固定模噴霧時間，可由機器上的調流閥與此時間做分別控制噴霧量多少

6. 第二吹氣計時，噴霧完成後，做為吹乾模面水分的時間控制

7. 第二次吹氣結束,模具自動關上



1. 快射起始點:此為慢射進的終點,轉接到快速射出切換為快射閥啟動,進行高速射出
2. 增壓起始點:射出末端點提高壓力2.1倍,提升模腔內的壓力,使鑄件密緻度更高,此位置最佳位於射出完了終點40～70mm
3. 射出跟出限:射出後,冷卻完成,開模時射桿同步往前推進,以同步推出進料口,往前行進的限制點
4. 5. 蓄壓器壓力:目前蓄壓器的壓力值及設置值
6. 7. 目前射出的位置顯示
8. 射退限位開關狀態顯示,射退限到位"ON"時,射出位置值會歸零,並且同時吹氣及料管潤滑供油



1. 前進限指示燈,手臂達前進限時手臂停止

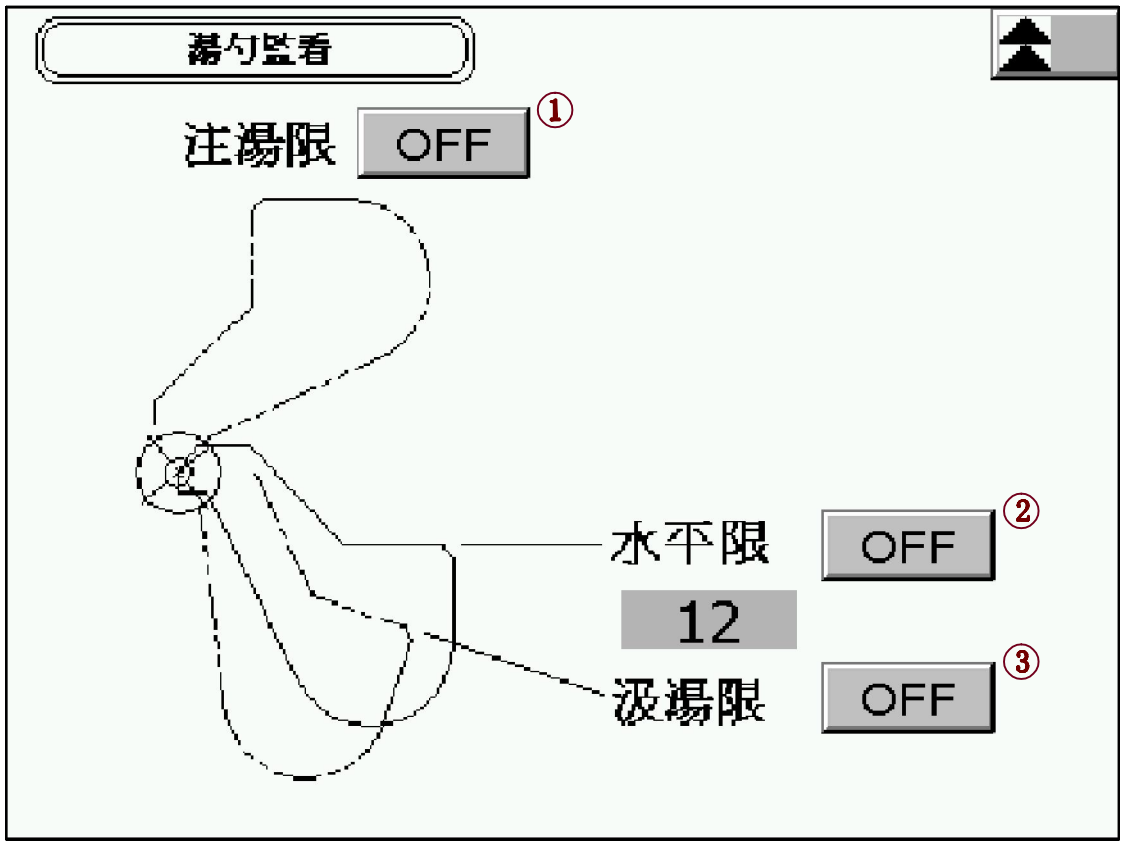
2. 前進減速指示燈,手臂達前進減速限時手臂開始前進減速

3. 手臂後退減速指示燈,手臂達後退減速限時手臂開始後退減速

4. 後退待機位置指示燈,手臂達待機位置即停止,湯杓作動

5. 後退限指示燈,手臂達後退限時手臂停止

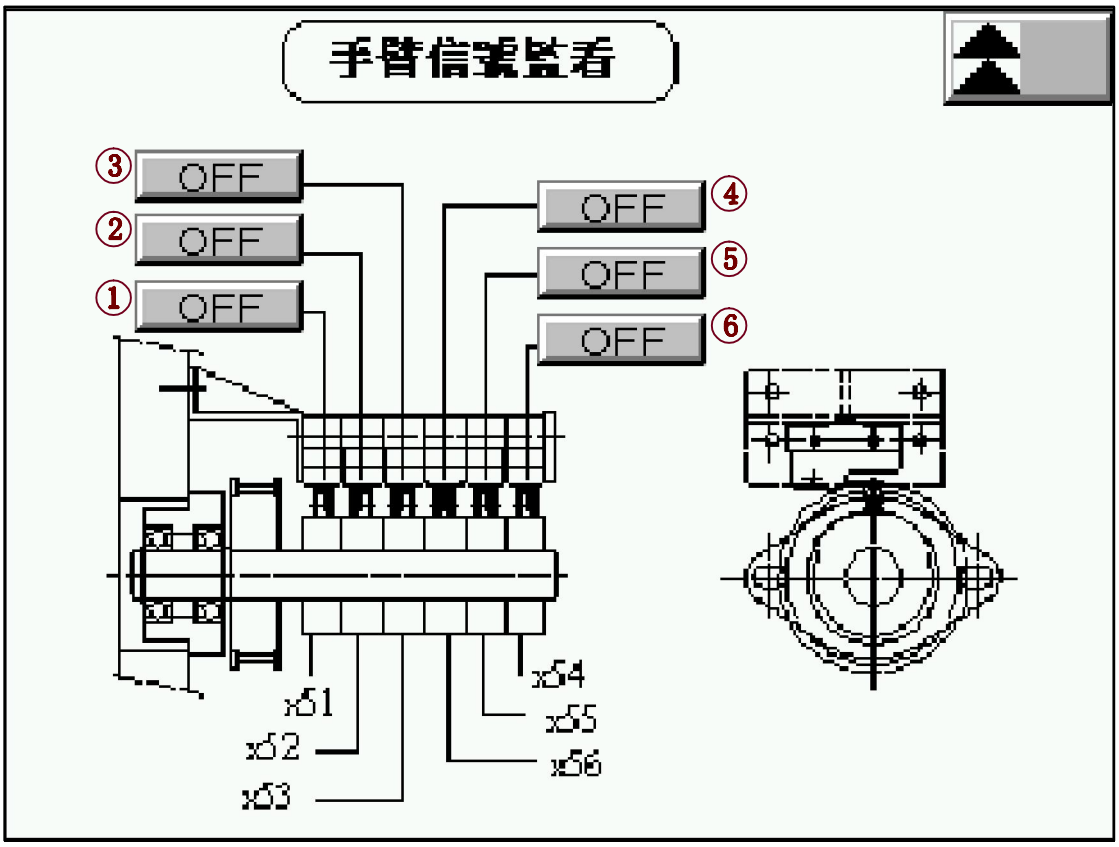
6. 液面檢出指示燈



1. 注湯限指示燈, 湯杓達注湯限時停止

2. 水平限指示燈, 湯杓達水平限時停止

3. 汲湯限指示燈, 湯杓達汲湯限時停止



1. 手臂後退限信號監看

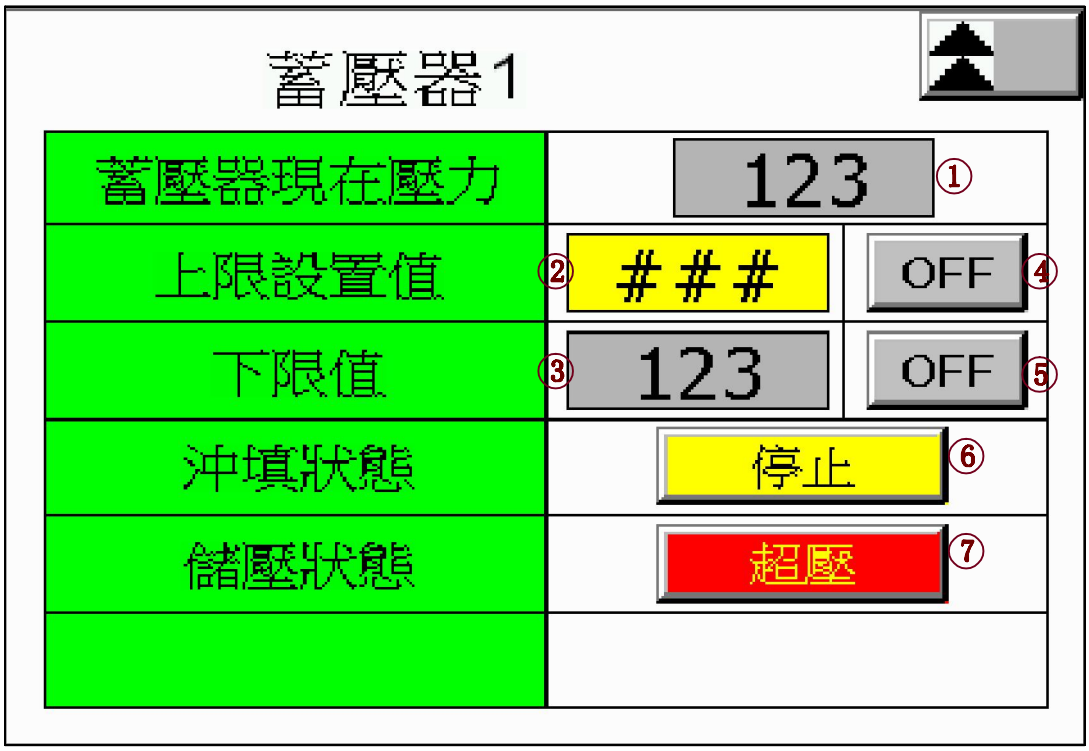
2. 手臂後退減速限信號監看

3. 手臂後退待機位置信號監看

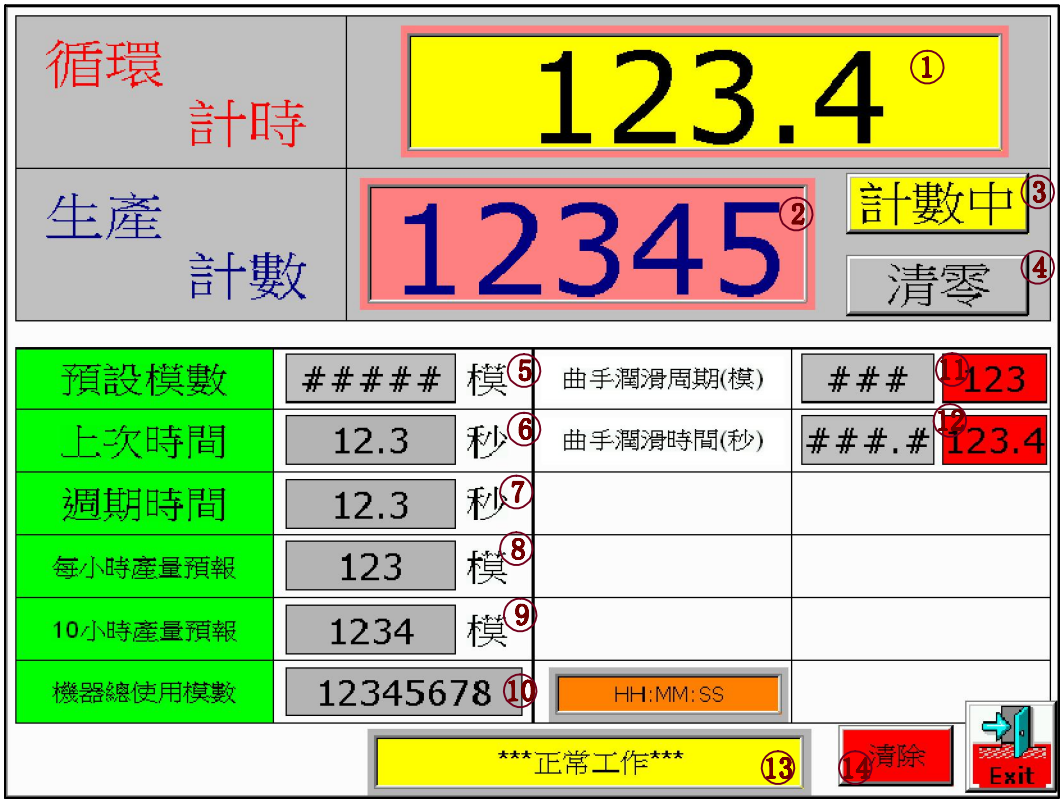
4. 手臂前進減速限信號監看

5. 手臂前進限信號監看

6. 手臂前進安全限信號監看



1. 主蓄壓器現在壓力顯示
2. 設置的主蓄壓器壓力，設入壓力值，蓄壓器即補壓到設置值
3. 下限值是系統自動根據上限值設置的，無法設入
4. 5. 顯示上下限目前的狀態
6. 蓄壓器現在值低於下限值時，系統會開始補壓，會顯示"補壓中"，如果"補壓中"時間超過30秒，則系統會有"補壓異常"的警報，此時則需降低上限的設置，或提高"押出與其他"以確保能正常補壓，中的"蓄壓器充填"中的壓力值大於"上限設置值"
7. 補壓異常導致"壓力安全閉關"動作時，會顯示"超壓"並且警報



1. 顯示目前的每模次週期時間
2. 3. 4. 生產數量的計數, 每次關模即計數一次, 亦可"中斷"計數或"清零"計數值
5. 預設模數值:達到設置數值時, 會有"產量已到達"的警示
6. ~9. 目前的生產速度, 預測未來時間的產出量
10. 機器總使用模次, 這計數值持續累積, 無法歸零
11. 12. 曲手打油機間歇模次及每次注油作動時間
13. 14. 異常狀態顯示並且可復歸