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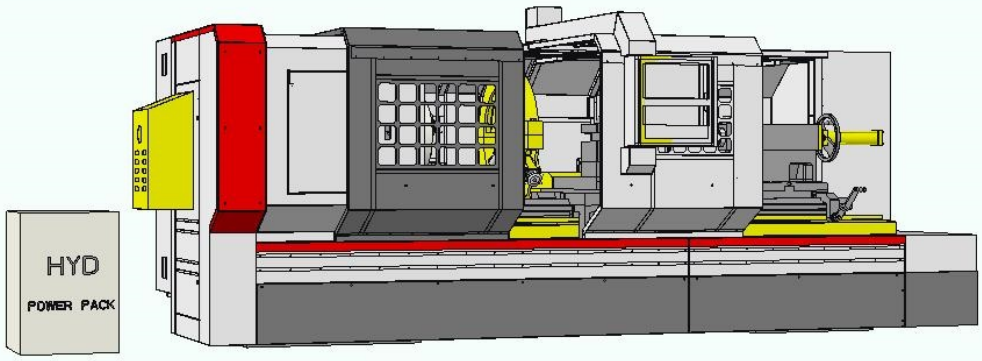

MODEL :- PFC-8020/8030

MACHINE No. ----------

Preface

Thank you for using the CNC lathe PFC-8020/8030 produced by our company. Before the installation and operation, please read this operation instruction carefully. If you do not operate in accordance with this operation instruction, we will not be responsible for personal injury, machine damage and other property damage. If there's any question, please contact us and we will offer you warm and sincere service on time.

This operation instruction mainly introduces the structure feature, operating principle, installation and adjusting, operation and maintenance, fault analysis and debug, transportation and storage. The machine system operation instruction and the technical files of main parts, such as inverter and driver, will be provided with other accessories.

This operation instruction is applicable to lathe PFC-8020/8030 and Other special made like products also can refer to this instruction.

If there's any difference between actual products and outside view of the products, other pictures, or menu screen, the actual product shall govern.

With continuous technology innovation, our manual instruction book will also be changed in the future. Please forgive us for not notifying you of the changes in the future.

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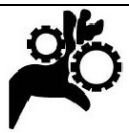
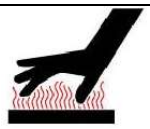
3 Safety instructions

3.1 notes

Relevant safety warnings of the machine:

	**Electric shock** **Operate carefully**		**Rolling** **Keep hands away**
	**Dangerous** **Do not touch**		**Rolling** **Keep clear**
	**Electric shock** **Keep ground wire connected**		**Rotating** **Keep hands away**
	**Do not shift gear before braking.**		**High temperature** **Do not touch**
	**Do not start spindle before removing the wrench.**		**Cut** **Keep hands away**
	**Do not wear gloves.**		**Fire** **No flame**
	**Close the protection door before operating.**		**Read operation details before operating.**

3.2 Safety cautions

1. The user shall read the *User's Guide and Programming Guide* and understand every function and operating procedure.
2. The user shall avoid contacting the control panel , transformer , motor , connection box and other parts that have high voltage connectors. Do not touch the switches with wet hands. Before replacing fuses, shut off the power that connects with the machine firstly.
3. Keep the floor around the machine dry and clean to avoid accidents.
4. Before operating the machine, check whether the electrical switch and operating handle of headstock is appropriate.
5. The numerical control box shall be kept dry and clean. The user shall periodically open the rear cover of numerical box to check and immediately remove the dust and dirt on the printed circuit board with blower or clean dry cloth.

6. To run the numerical box, firstly turn on the power and then turn on the amplifier. To turn off the numerical box, firstly turn off the amplifier, and then turn off the power.
7. Check the lubricating box regularly. Fill lubricating oil when necessary.
8. Check the level of cooling liquid and fill it when necessary. Replace the seriously polluted cooling liquid in time.
9. Check the tension force of the belts. Replace the belts that lack tension force.
10. It is strictly prohibited to modify or remove limit switch and interlocking device.
11. When the chuck clamps workpiece, the scope of clamping or expanding should not go beyond the its limit prescriped in the factory document of the chuck.

3.3 Operation instruction

1. Operators must receive the technical training before operating. Otherwise, they should not operate the machine.
2. Before the first-time operation of the machine, the operator should read the *User's Guide of Machine* and *System Operation Manual*, lubricate all parts completely in accordance with the requirements, and get familiar with the position and functions of all handles and keys.
3. Before each running of the machine, the operator shall check whether the parts that need lubrication are clean and have enough lubricating oil or not, and whether all screws are tightened. And load-free running shall be performed for a short period before operating the machine.
4. Before shifting the manual-shift machine, stop the running, press the speed plate, and move the handle to the appropriate position. Then the machine can be shifted.
5. When the machine is automatically running, the protective door must be closed. To avoid accidents, the operator can check the processing of the workpiece through the observation window.
6. All wrenches, tools and parts should be kept away from the spindle, work bench and moving parts of the machine.
7. Before replacing cutters, the spindle rotation should be stopped.
8. Do not modify the parameters, values or other electrical settings discretionally. If necessary, before modifying, record the initial value in advance to make it convenient for the recovery of the initial value.
9. Do not pollute, damage, drop or remove the warning plate. If the words on the plate are unclear or missing, the user shall order a new plate in time.

4 Overview of the machine

4.1 applicable scope

This lathe can automatically turn various kinds of circular surfaces, such as cylinder surface, circular cone surface and special shaped surface, of steel, iron and other metals. It also can do grooving, threading, boring and reaming, and is available for the metric and inch cylindrical threading and cone-shaped threading. But it shouldn't be used to process inflamable material, such as wood.

Note: It is strictly prohibited to machine spare parts whose diameters and other specifications are beyond the machine's limit, otherwise, it will cause damage to the machine and even personal injury.

4.2 operating principle

Adopting modular design, the lathe can automatically control the machine according to the procedure that programmed by the CNC system to turn the blank into finished products.

4.3 accuracy of the machine

The accuracy of the machine meets the Standard.. ***CNC Horizontal Lathe: Precision Testing*.**

4.4 noise of the machine

It is tested in according of Standard ***Metal-cutting Machine Tools--Measurement Method of Noise Pressure Level***. The noise pressure level under idling of the machine is less than or equal to 85dB(A)

4.5 operating environment

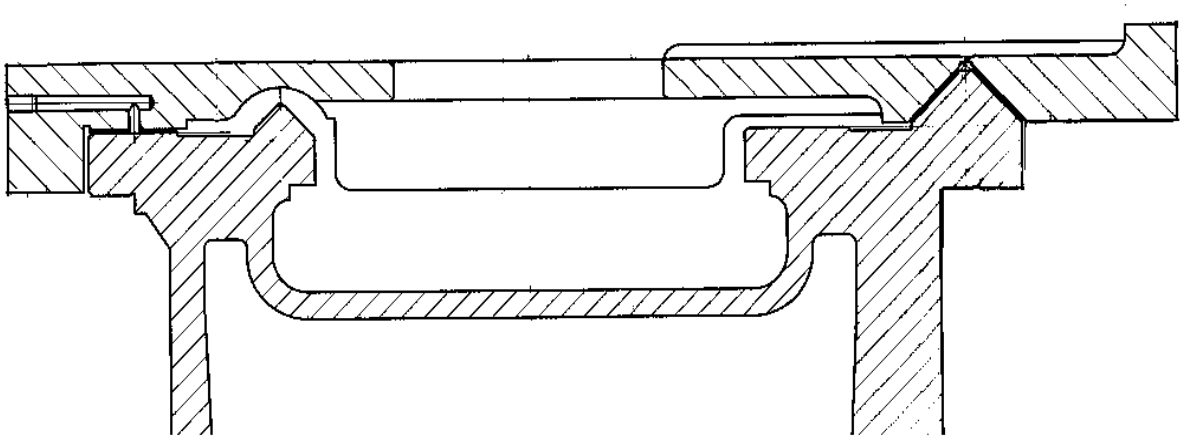
The suitable environment of the machine:

1) temperature: 5~35□, the average temperature should not be higher than 30□ within 24 hours;
2) relative humidity: 30%~95%, and the change of humidity shouldn't cause condensation;
3) altitude: under 1000m;
4) air: Free from much dust, acid gas, etchant gas and salinity;
5) avoid the change of ambient temperature that caused by direct sunlight or thermal radiation;
6) far away from vibration source;
7) far away from inflammables and explosives.

4.6 main parts

4.6.1 lathe bed

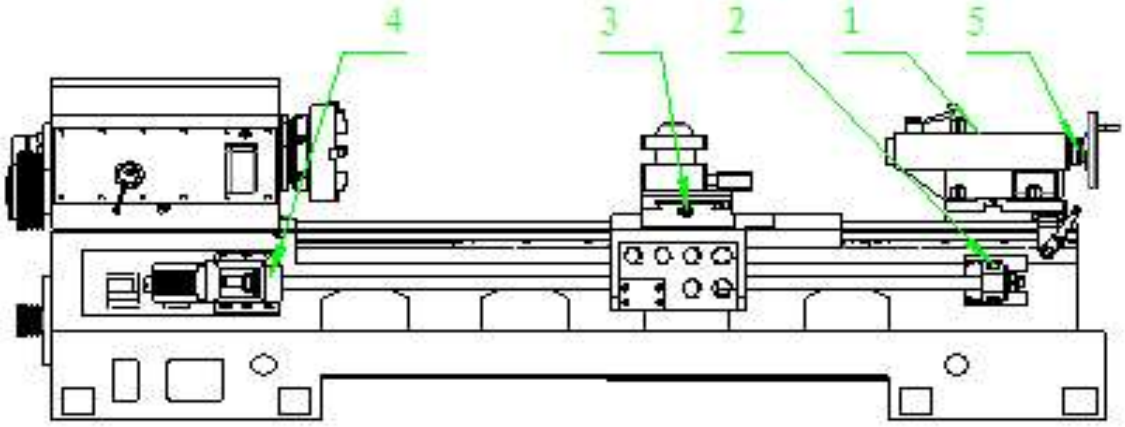
With the adoption of the box type ribbed bottom structure, the machine bed has high rigidity and long-term precision. The peripheral grinding is performed on the guide way after supersonic quenching. The guide way contains two flat guides and two rhombus guids, of which the front rhombus guide and the back flat guide are used for carriage moving, and the left ones arre used for tailstock moving and center post moving.



4.6.2 head stock

The head stock is cased by adopting the resin sand technology. It is a closed stock, containing five transmission shafts: main spindle©□, spindle□, spindle □, and spindle □. The internal gear is made of high-quality steel which is high-frequency quenched and has the distinctive features of abrasion resistance and high speed. With the adoption of the short taper flange structure, the machine spindlehead has precise positioning and convenient assembling and disassembling of chucks and can be used reliably. With the power transmitted by the V-belt and gear, the spindle rotates and achieve three gears, stepless speed change within each gear. (the users can select the clamping tools according to the requirement: hydraulic chucks, common chucks or special clamping tools.) See the picture 4.6.2:

Picture 4.6.2



4.6.3 Longitudinal feed

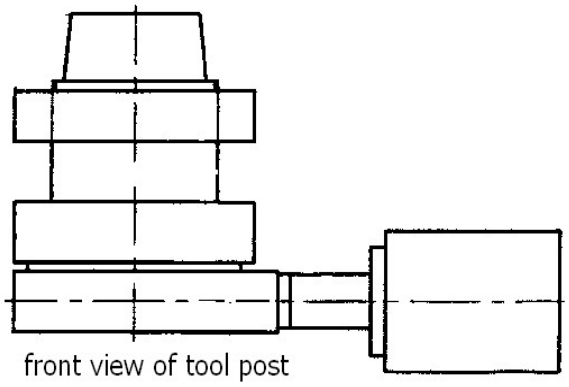
The longitudinal feed system of the machine is driven by the motor: . The CMFZD6310 ball screw assembly adopts centralized automatic lubrication，supported by five sets of 50TAC100B bearings. As the motor directly connects with the screw, it has a stable performance and high precision.

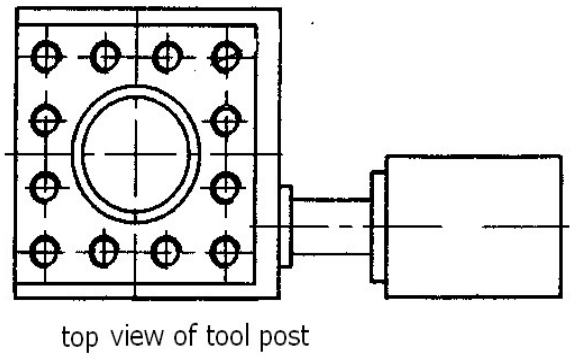
4.6.4 cross feed

The cross feed system of the machine is driven by the motor. The FFZD3206 ball screw assembly adopts centralized automatic lubrication, supported by three sets of 25TAC52B bearings. As the motor directly connects with the screw, the machine has stable running, low noise and high precision.

4.6.5 tool post

The tool post can move cross and longitudinally, also can move cross and longitudinally at the same time. The users can select the tool post according to their need: fixed tool post, four-station electric vertical tool post, six-station electrical horizontal tool post, and so on.


front view of tool post


top view of tool post

4.6.6 tail stock

The fixation of tailstock to machine bed uses the fast eccentric chucking structure, so it can be easily operated. The method of moving of tailstock sleeve can be as manual or hydraulic automatic according to the users' need.

4.7 technical parameters

	PFC-8020/8030	
Max. swing over bed	Φ800mm	
Max. swing over carriage	Φ475mm	
Center distance	2000/3000	
Max. truning length	2000/3000	
Spindle bore	Φ105mm	
Spindle speed range	8~800r/min	
Main motor power	15KW/50HZ	
Longtitudal feeding speed	4~6m/min	
Cross feeding speed	3~5m/min	
Tool rod	32x32mm	
Tailstock sleeve dia.	Φ100mm	
Tailstock travel	150mm	
Dimension	4.7x2.36x1.85	5.5x2.36x1.85
Machine net weight	6200kg	6800kg

5 Lubricating system

5.1 lubrication of headstock

5.1.1 lubrication oil type and the position of oil tank

The headstock uses 46# anti-wear and pressure resistant hydraulic oil. The lubricating oil tank is behind the left bed corner. The oil pump motor and cycloid pump is inside the system sliding door over the left bed corner. Check the oil level through the oil oberservation window on the tank. (picture 4.6.2)

5.1.2 clean and change

Change the lubricating oil every month if the oil is used for the first time. Then change the oil every 3 months. When changing the lubricating oil, first let out the left oil from the outlet on the right of spindle box. Then clean out the sediment by kerosene. At last, plug up the bleed hole and fill in new and clean lubricating oil,then fasten and seal tank cover.

5.2 lubrication of the guideway

5.2.1 notes

1) The guide and leading screw of the machine use the centralized automatic lubrication, in which the lubricating oil is filled automatically every 15 minutes.

The lubricating oil level of the lubricating pump shall be checked regularly and fill oil in time. When the oil level is under the level line, it is strictly prohibited to operate, otherwise it will easily cause oil pump breakdown or there will be bubble in the outlet oil. When the low oil level switch alarms, the specified oil must be filled in.

2) When fill oil, the oil-filter screen shouldn't be taken out.

Figure 4.6.2 shows the parts for manual lubrication:

Fill lubricating oil at 1,3,5; Fill high-grade grease at 2,4.

5.2.2 recommended oil:

Below 0□ N32# slideway oil or machinery oil;

1□～20□ N32#～N68# slideway oil or machinery oil;

Above 21□ N68#～N100# slideway oil or machinery oil;

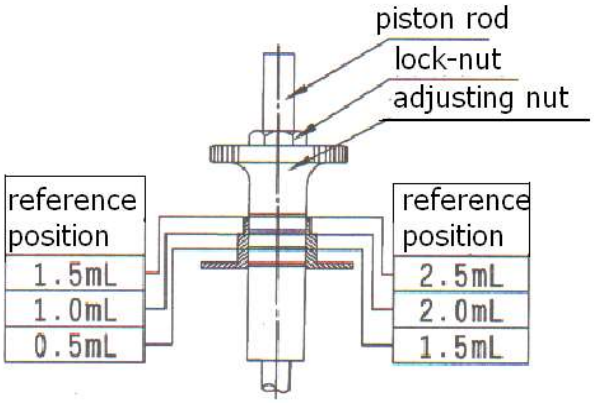
Slideway oil: GB/T7631.11-94, machinery oil: GB443-89.

5.2.3 adjusting the oil quantity of the lubricant pump

1) loosen the lock-nut

2) adjusting screw(a. turn clockwise, the quantity of oil outlet increases; b. turn anti-clockwise, the quantity of oil outlet decreases)

Adjust the oil quantity in accordance with the scale noted on the oil quantity adjusting nut, and then fix the lock-nut. (picture 5.2.3)



5.2.3 adjusting of oil quantity drawing

5.2.4 adjusting range of the oil quantity

When the nominal displacement of oil pump is 2.5mL per time, it is permited to adjust between the scale 1.5～2.5ml; when the nominal displacement is 1.5mL per time, it is permited between 0.5～1.5ml; above the scale of 2.5ml and 1.5ml, the inner parts will be damaged; under the scale 2.5ml and 1.5mL, the connecting part of connecting part and piston will be off the working position, the piston will not work and displacement will stop.

Note: It is not allowed to adjust the oil quantity when the machine is running; It is prohibited to adjust the oil quantity more than the specified value of the scale.

5.3 lubrication of tailstock

The tailstock sleeve and leading screw bearing is lubricated with the manual filling of ball oil cup. If the frequency of use of tailstock is high, the users shall regularly fill oil. (as 1 and 5 of figure 4.6.2)

6 Cooling system

6.1 position of the cooling system

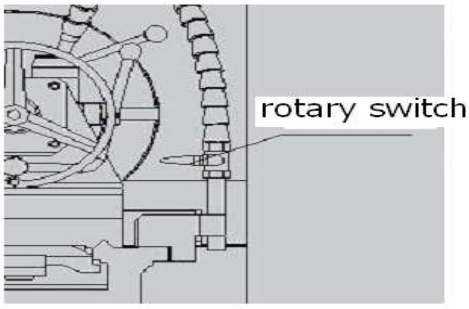
The cooling liquid uses emulsified liquid. It is stored in the right bed legs. If the bed length is more than 2 meters it will be stored in the middle bed legs.

6.2 the addition of the cooling liquid

The fixed cooling liquid is lead from the interspaces of the lathe bed to the chip-receiver and water tank to make sure the quantity of cooling liquid is enough.

6.3 adjusting of the cooling system

With the use of cooling electric pump, the lathe performs cooling thought the adjus table plastic cooling tube. The floe rate of the cooling liquid can be adjusted through the revolving switch. (As is shown in the following picture)



6.4 change of the cooling liquid

When the liquid decreases, check the liquid level in time, if the liquid is inadequate, fill in time. If the liquid is dirty and metamorphic, change it. Use magnet to attract the iron chip and clean the chip receiver.

6.5 clean of the cooling system and notes

Usually, after half a year of the operation, the cooling system should be cleaned in time to assure the normal service life.

1) First close the cooling pump and cut off the power;
2) Take out the cooling pump from the water tank and let out the remained cooling liquid in the water tank through the outlet.
3) Loosen the power line of cooling pump and loosen the fixed screw, take down the cooling pump;
4) Clean the cooling pump by clean water;
5) Clean the sediment in the water tank;
6) Put the cooling pump back, connect and fix;
7) Connect the power of cooling pump.

Note: 1) Inflammable and poisonous cutting liquid is forbid using;

2) Do not pull the clean water on the connecting position of the power line when clean or add cooling liquid, to avoid short circuit.

7 the lifting and installation of the machine

7.1 transport of the machine

The lathe is fixed by the wood pallet and covered by transparent plastic (the lathe with special requirement is covered by packing cases), and then leave the factory. And in this condition it can stand no more than 24 hours in short range transport and storage.

7.2 lifting of the machine

Usually, the lathe is lifted by the crane not by the forklift. When lifting the machines in packing cases, the operator shall use wire ropes according to instructions on the cases, in order not to cause impact or vibration to the cases during moving and disassembling. Lift the machine in accordance with the drawing of lifting to make sure the the balance of the lathe.

1) Lifting drawing of the lathe with center distance is 2000mm (1 of figure 7.2)
2) Lifting drawing of the lathe with center distance is 3000mm (2 of figure 7.2)

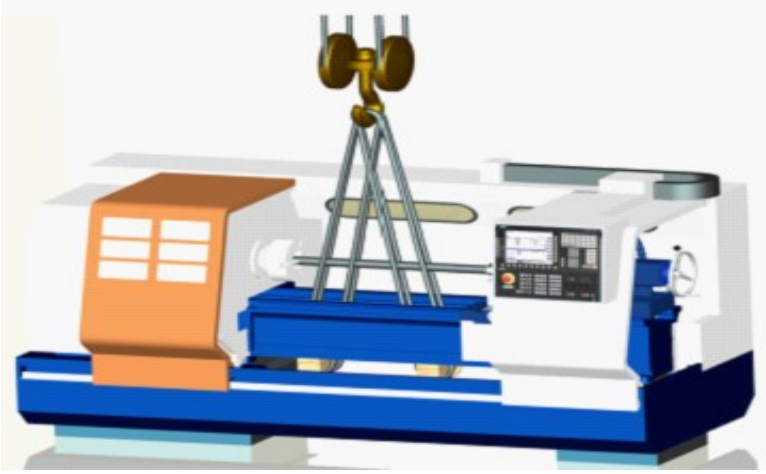


Figure 7.2.1 Lifting drawing of the lathe with center distance is 2000mm

Figure 7.2.2 Lifting drawing of the lathe with center distance is 3000mm

Note: 1) Keep the balance of the lathe since it is lifted from the ground;

2) If the lifting is not done by one, people should cooperate with each other to finish the lifting.

7.3 devanning

After disassembling, check the outside condition of the machine, and check the accessories according to the packing list

7.4 installation

7.4.1 preparation before installation

As to the installation of the machine, beside the environment in 4.5, the following points also need to be noted:

1) The plant in which the lathe is installed should have lightning arrester;
2) The installing ground should be hard, avoid the soft and not solid ground in order to avoid the sink and tilt of the machine;
3) If the lathe is installed near the vibration source, there must be anti-vibration ditch around the lathe, or take other anti-vibration measures.

7.4.2 power supply

Requirement: the instability degree of three-phase voltage should be less than±5％, and the unbalance degree of three-phase power should be less than ±2.5％. Incoming line Cable must be guaranteed to be 4x10 square or above.

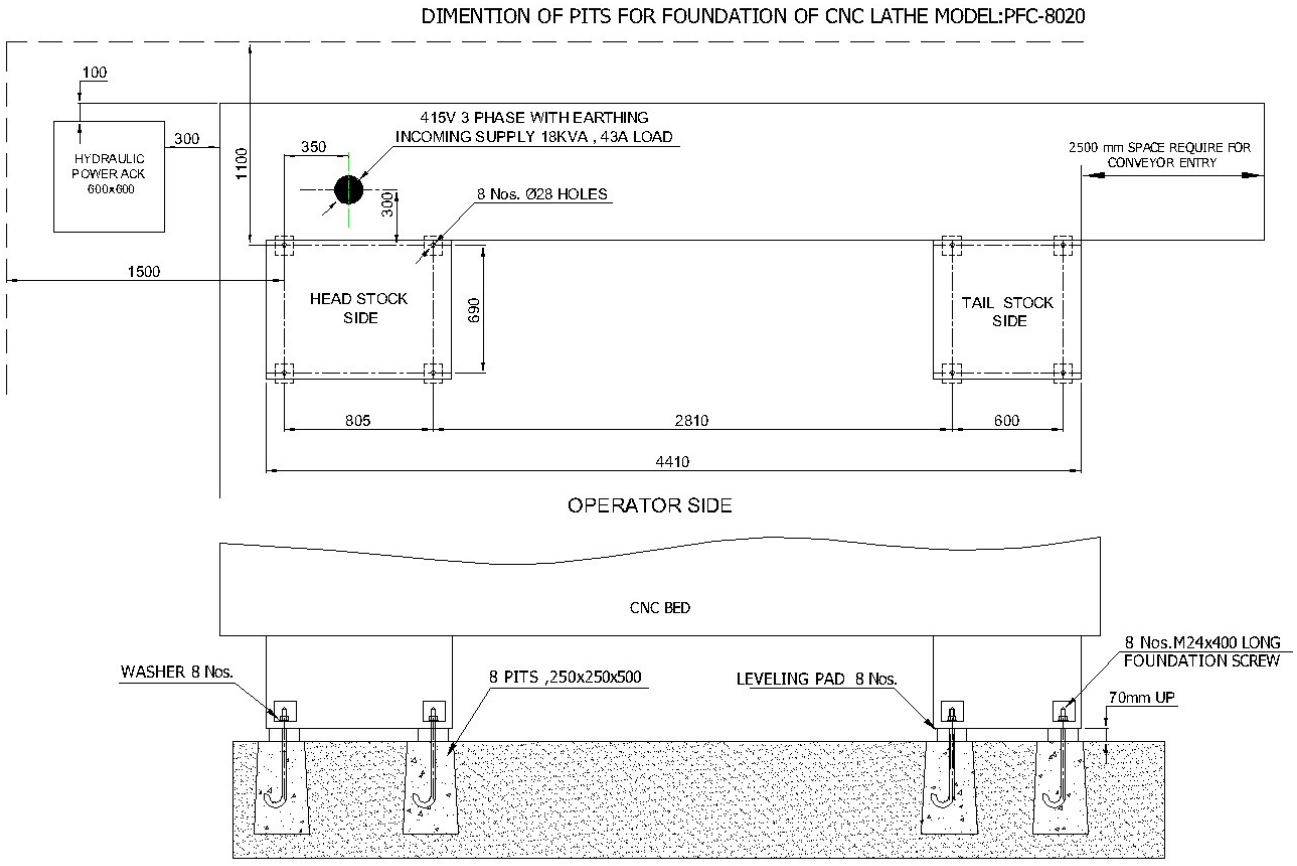
7.4.3 installation

It directly influences the working accuracy of the machine whether the installation is correct or not. Because the guideway is processed precisely, if the lathe can't be installed well, the set precision will not be reached and most of the faults are caused by bad installation, which should be noted.

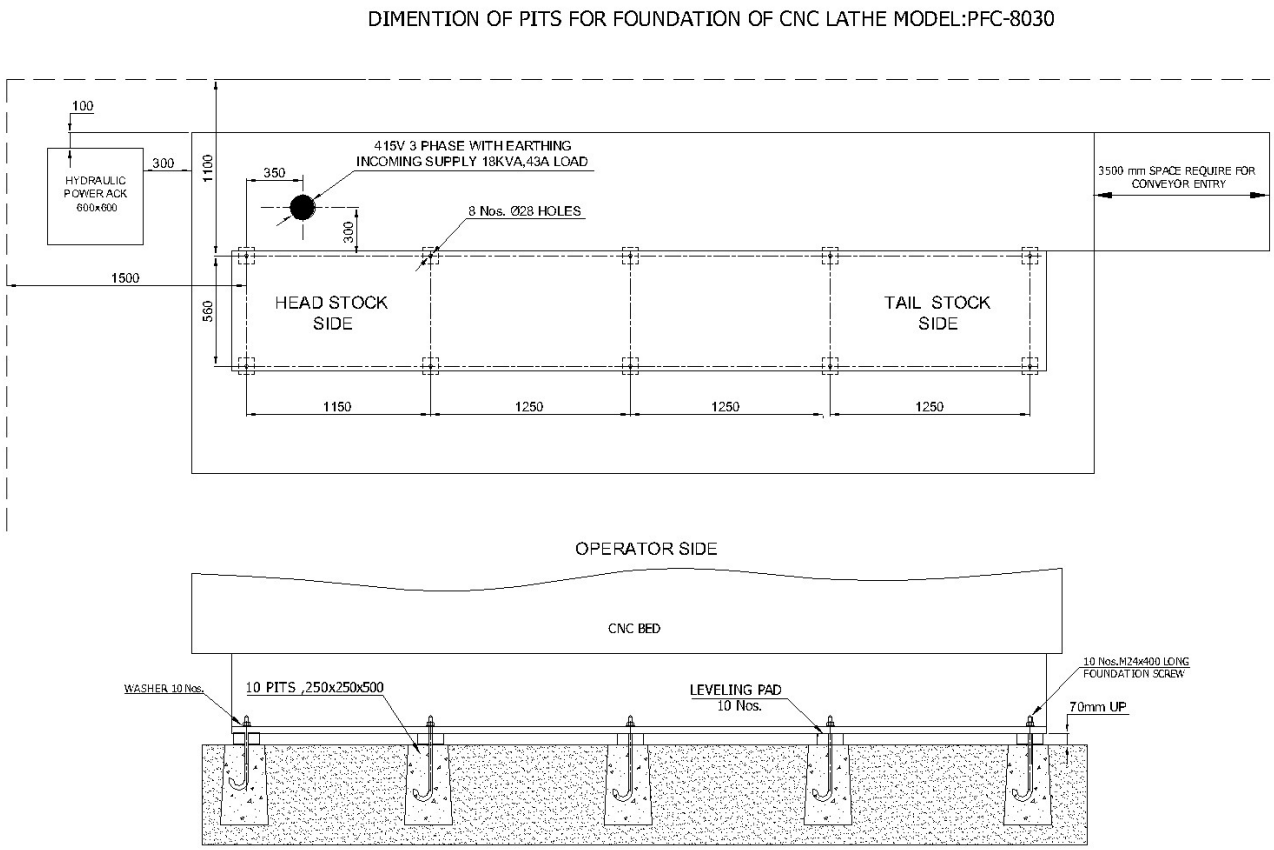
7.4.4 foundation

First choose a flat place, make the foundation well in accordance with the environment requirement and the following foundation drawing. If there are several lathes, the operation and maintenance space should be taken into consideration. The left space should be at least 1 meter around one lathe.

1) Foundation drawing of the lathe with center distance is 2000mm



2) Foundation drawing of the lathe with center distance is 3000mm



7.4.5 installation steps

1) Set one head of the foundation bolt in the foundation hole and the other head fixed with the lathe. Set the six sets of adjusting block near the prepared foundation hole and install the lathe on the blocks.
2) Rough adjustment: Adjust the iron blocks. Use the leveling instrument to check the level of machine. Control the longitudinal level and transverse level to make them not exceed 0.02/1000 and 0.06/1000 respectively.
3) After the rough adjustment, fix the foundation bolt with concrete. When the concrete is completely dry, go on precision adjustment.
4) Precise adjustment: Move the six sets of iron block to the position of foundation bolt, and move the saddle to the middle of guide of machine bed. Adjust the iron blocks to make the longitudinal and transverse directions basically horizontal. And transversely place the leveling instrument. Perform the precise adjustment of the iron blocks, and make the differential value of the leveling instrument not more than 1 unit of graduation (0.02/1000 leveling instrument) when the saddles are respectively placed at the head and tail of guide of machine bed.
5) Fix the foundation bolts tightly, but this shouldn't influence the accuracy of the installation. Trowel the ground flat to avoid the lubricating oil seep in.

7.4.6 level check

Since the installation check the levelness at the sixth month. If anything is abnormal, correct it in time to make sure the levelness of machine bed. Afterwards, the check peroid can be prolonged in accordance with the practical situation. When the change is smooth, it can be checked once or twice in a year.

7.5 test run

7.5.1 preparation before test run

1) Clean: Before leaving the factory, antirust oil is painted on the surface of the guideway and some metal parts, and these parts are covered with antirust paper. Because during the transport, dust may dirt the machine, so cleaning must be done.
2) When do the cleaning, first remove the antirust paper, wipe off the antirust oil and then fill the lubricating oil in accordance with the operation instruction. The leading screw also needs to be cleaned and painted with lubricating oil.
3) Check: check if there's any damage or loss of each part and accessory, and check whether every part is lubricated completely.
4) The parameters of structure relevant to the machine precision have been set before the machine leaves factory. Except for the adjustments required by the installing level or normal operation, the user shall not make adjustments of other structure and parts.
5) Check whether the connection of electric line is correct. After conneting the wire, first check the elactrial appliance system, press the button of tool-changing and seeing if there's tool-changing movement. Only when the tool post rotates forward, can each part work normally.

7.5.2 test run

The idling tests shall be performed after the above procedures are completed. The rotation speed shall gradually be improved from low speed. The time of idling test shall not be less than two hours. Only after the idling test is completed can the commissioning cutting be performed. There shouldn't be heavy load during the test run.

8 Operation

8.1 preparations before operation

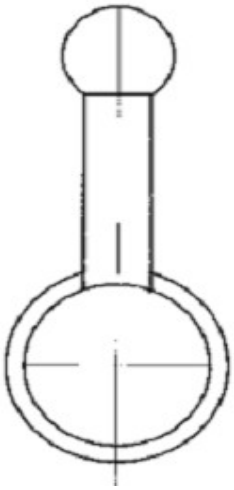
1) Lift the left side switch and the power will be on, and turn on the light;
2) Press the green button of start to connect the power;
3) According to the difference of work piece to program and record it into the system;
4) According to the difference of work piece to choose the appropriate way of installing chuck, and clamp the work piece in the chuck;
5) According to the different material of work piece choose the relevant tool;
6) Choose the appropriate spindle speed, start the spindle and begin the test cutting;
7) If the test cutting is correct, press the cycle start button and the machine will

automatically run.

Note: In order to operate conveniently, choose the suitable pedal plate in accordance with the height of the operator.

8.2 operation of shifting gears of the headstock

With the handle of gear-shifting adjust the spindle speed. There are three positions of the handle, M41、M42、M43. The three gears respectively correspond rotating speed range and the speed can be changed random in the range. In accordance with the difference of work piece choose the relevant speed. (As the following figure)



M41	M42	M43
X--XX	X--XX	X--XX

Note: Shift the gear after stopping the operation, or there will be the hazard of the gear is beat.

8.3 operation of tailstock

The tailstock is fixed on the lathe bed by pressing board 1. The lock of tail stock is realized by lock handle 2 or clamp nut 3. The move of tailstock center is realized by adjusting handle 4 the screw of two sides. The move of sleeve 5 is realized by hand wheel 6. The tight and loose of tailstock 5 sleeve is realized by lock handle 7. (As the figure 8.4.4)

8.4 adjusting of the machine

8.4.1 adjusting of the headstock

1) adjusting of spindle bearing

If there's interspace in spindle bearings, adjusting should be done, or it will influence the process precision. The front bearing is adjusted by nut 1and 2, and the back bearing is adjusted by nut 3. (Figure 8.4.1)

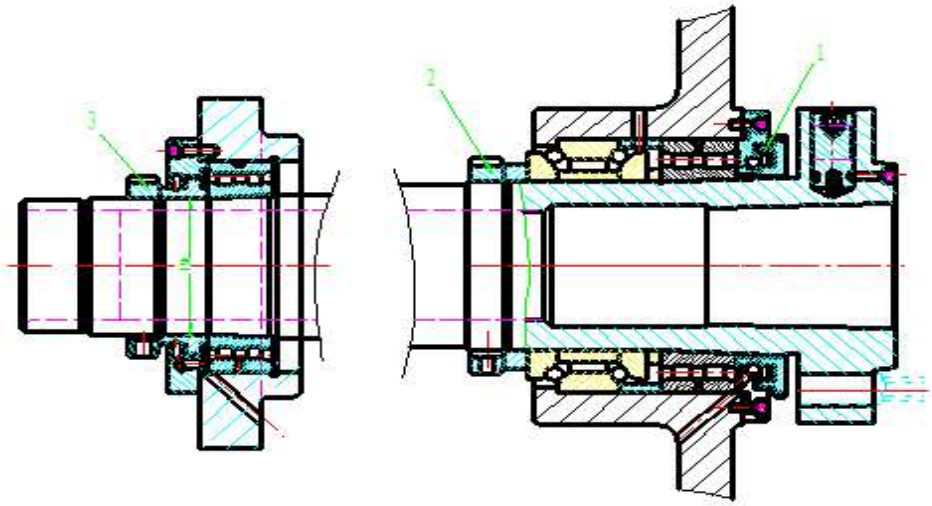
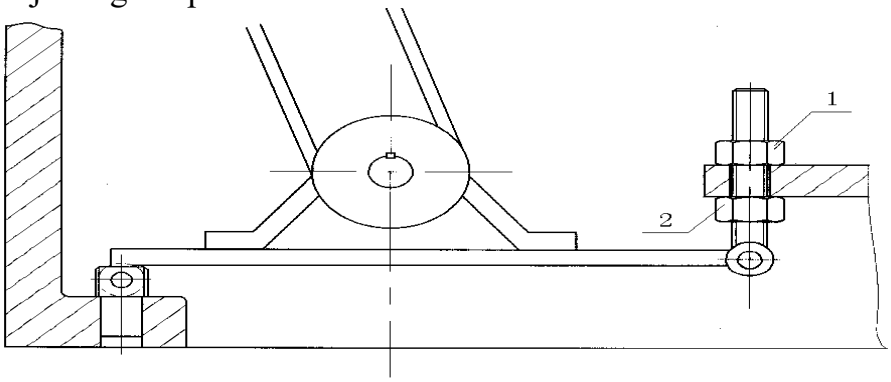


Figure 8.4.1

2) adjusting of spindle V-belt



Check the tightness of V-belt regularly and adjust it by nut 1 and 2 to make the V-belt in good working condition. (Figure 8.4.2

Figure 8.4.2

Note: when check the tightness of the V-belt, do not put you hands between the belt wheel and the V-belt.

8.4.2 adjusting of transverse X-axis

If the X-axis works for a long time it may cause interspace. The procedure of adjusting:

First loose the screw on the back cover 1 and take the cover down. Then loose screw 2 and tighten screw 3, and then tighten screw 2 again. At last, install the back cover and tighten the screw. (Figure 8.4.3)

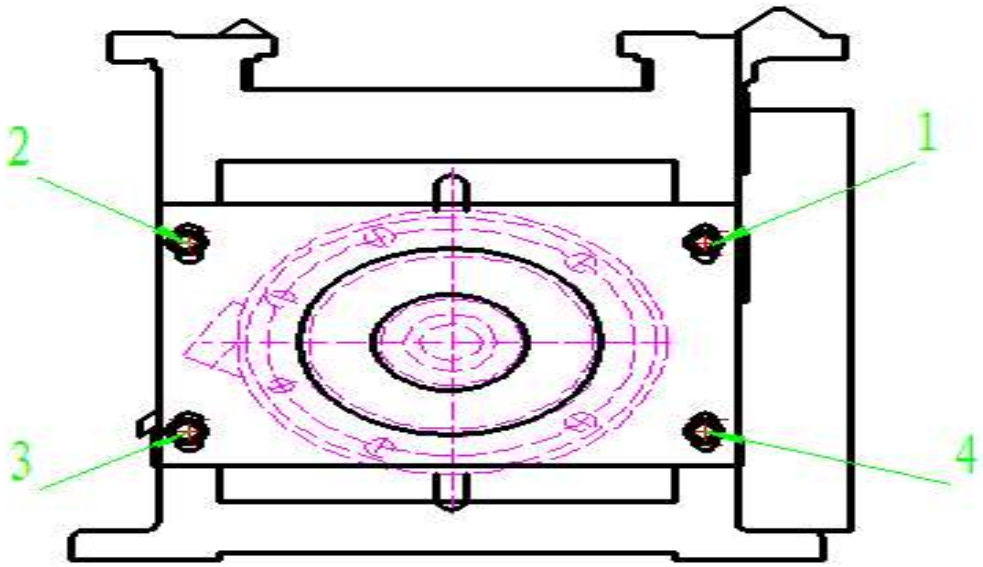
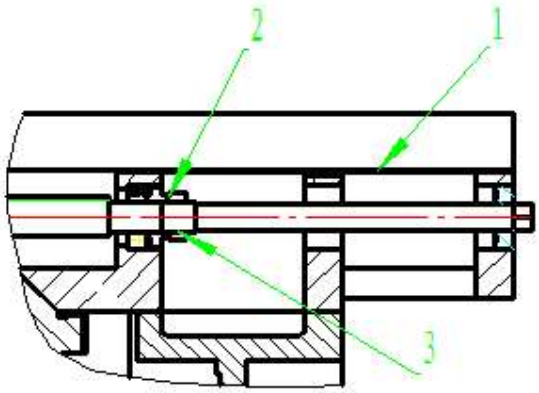


Figure 8.4.3

8.4.3 adjusting of carriage on X-axis

When the panel of middle carriage is loose, adjust the tightness of the panel by adjusting the front and back screws. First take down the scraping plate at the front end of middle carriage, and then adjust with the screwdriver.（ As the following figure）



8.4.4 adjusting of tailstock

If the tailstock is bearing the medium load, the fast chucking handle 2 can fasten tailstock. If the load is too big, nut 3 also can fasten. If handle 2 can't chuck tightly, the main reason is nut 8 is loose, at this time adjust nut 8. (Figure 8.4.4)

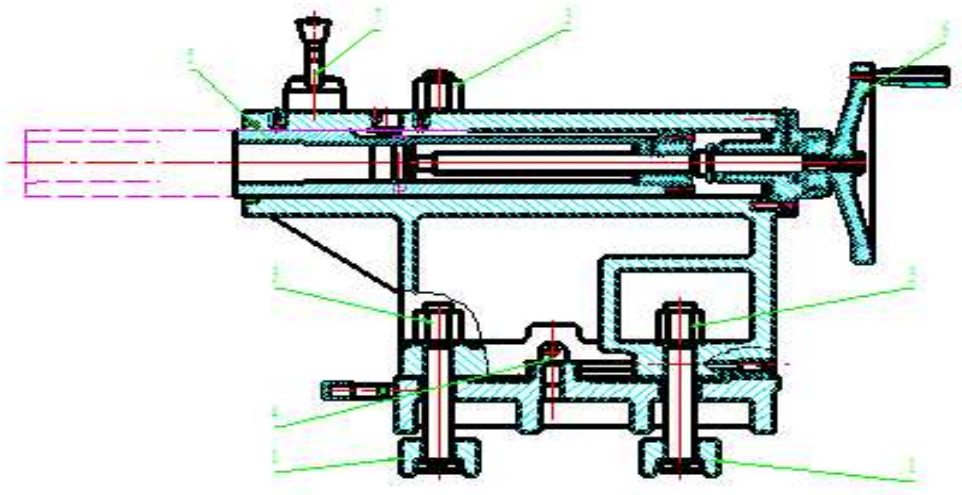


Figure 8.4.4

9 Maintenance and inspection of the machine

9.1 maintenance

1)After the work is finished, clean all parts of the machine, and refill oil on the guide way and positions that need oil refilling.

2) Before each running of the machine, the operator shall check whether the parts that need lubrication are clean; whether all screws are tightened or not. And no-load running shall be performed for a short period before operating the machine.

3) The floor around the machine shall be kept clean. Clean the iron chip everyday and use the specified hook or other tools. When clean, bare hand is not permitted.

4) Before off duty or leaving, turn off the power.

5) Watch the work condition of the oil pump regularly to make sure there's adequate lubricant in headstock and each feed shaft.

6) To avoid interference, do not pile the iron chip or make the engine oil or cooling liquid overflow.

7) On the finishing surface, guide way and carriage of the machine, do not place any items that easily damage the machine.

8) The refilling and replacing of oil must be performed periodically according to the lubrication chart. And check the opening inside the spindle box periodically in order to avoid blocking.

9) After the initial use of the machine, the spindle lubricating oil shall be replaced in one month. Afterwards, the replacing shall be performed every three months. When replacing lubricating oil, the filtering and cleaning shall be carried out to avoid damage to the bearings and gears.

10) The degree of tightening of the v-belt shall be periodically checked to keep it in good working conditions.

11) Do not pollute damage, drop or remove the warning plate. If the words on the plate are unclear or missing, the user shall order a new plate in time.

12) If the phenomena including abnormal noise fume and overheat occur, the user should stop the machine; notify the repair department of the factory to check.

9.2 inspection

In order to keep good work condition, prolong the service life and improve the work efficiency, the inspection of the machine is needed.

The maintainer shall understand the machine structure and have related knowledge on machinery and electronics. Before repairing the machine, please look up relevant materials.

The power must be turn down during the inspection. The warning mark, such as "Machine being maintained, do not turn on the switch." should be hanged near the power switch or other eye-catching places. The inspection items:

No	inspection part	inspection items	time
1	electrical appliance	If the terminal screw is tight in distribution box.	6 months
		If there's wear of cables and wires	
		If each switch and button is sensitive	
		If the drive switch is normal	
		If there's abnormal phenomenon such as heating in main motor, leading screw motor and cooling motor, and so on.	
		Check the ground connection condition and interlocking condition between each part.	
2	operation	If each control handle is in good condition.	3 months
		If there's interspace in spindle, leading screw and carriage.	6 months
		If the tightness of the V-belt is appropriate.	6 months
3	lubricating and cooling system	If lubricating pump and cooling pump can work normally.	3 months
		If the lubrication is smooth of each lubricating point.	
		If the level of lubricating liquid and cooling liquid can meet the using requirement.	
		If there's damage on the scratching plate.	
4	safety protection appliance	If the organic glass door is clear.	1 month
		If the limit appliance of the middle carriage can work normally.	6 months
		If the protection of chucks can work normally.	

9.3 fragile parts list

No.	Name	Position
1	Strip lamp	On the apron
2	Cooling water pipe	On the carriage

Note： the warranty period of the fragile parts is three months.

9.4 common faults

No	The fault	Cause
1	The lubricant pump doesn't supply oil.	1, oil circuit jammed; 2, oil pump motor irregular working.
2	The lamp doesn't work.	1, poor contact; 2, line fault; 3, the lamp is bad.
3	Cooling liquid doesn't flow out.	1, programming error; 2, abnormal setting of cooling switch; 3, cooling water pipe not in the water tank; 4, cooling water pipe jammed or filter screen of chip-receiver plate jammed; 5, cooling pump motor irregular working.
4	Tool post doesn't stop.	1, irregular working of position coder of tool post; 2, tool post relay irregular working.
5	Spindle doesn't turn.	1, check the driving connection; 2, breaker trips; 3, inverter irregular working; 4, main motor irregular working.
6	X/Z axis is not precise.	1, space emerges between carriage and panel; 2, pressing block is loose 3, nut is loose 4, space emerges between nut seat and leading screw.
7	Emergency stop alarm.	1, emergency stop switch rebounds; 2, limit switch is closed.

10 Belt list

11 bearings

11.1 bearing list

7025C	Angular contact ball bearing	4	Z-axis
51202	Thrust ball bearing	2	X-axis
51305	Thrust ball bearing	1	Tail stock(CK6150C series)
51305	Thrust ball bearing	2	Tailstock(CJK6163C/CJK6180C series)
51203	Thrust ball bearing	2	X-axis (CJK6163C/CJK6180C series)
6000	deep groove ball bearing	4	Tailstock(CJK6163C/CJK6180C series)

12 Electrical appliances

12.1 appliance parameters

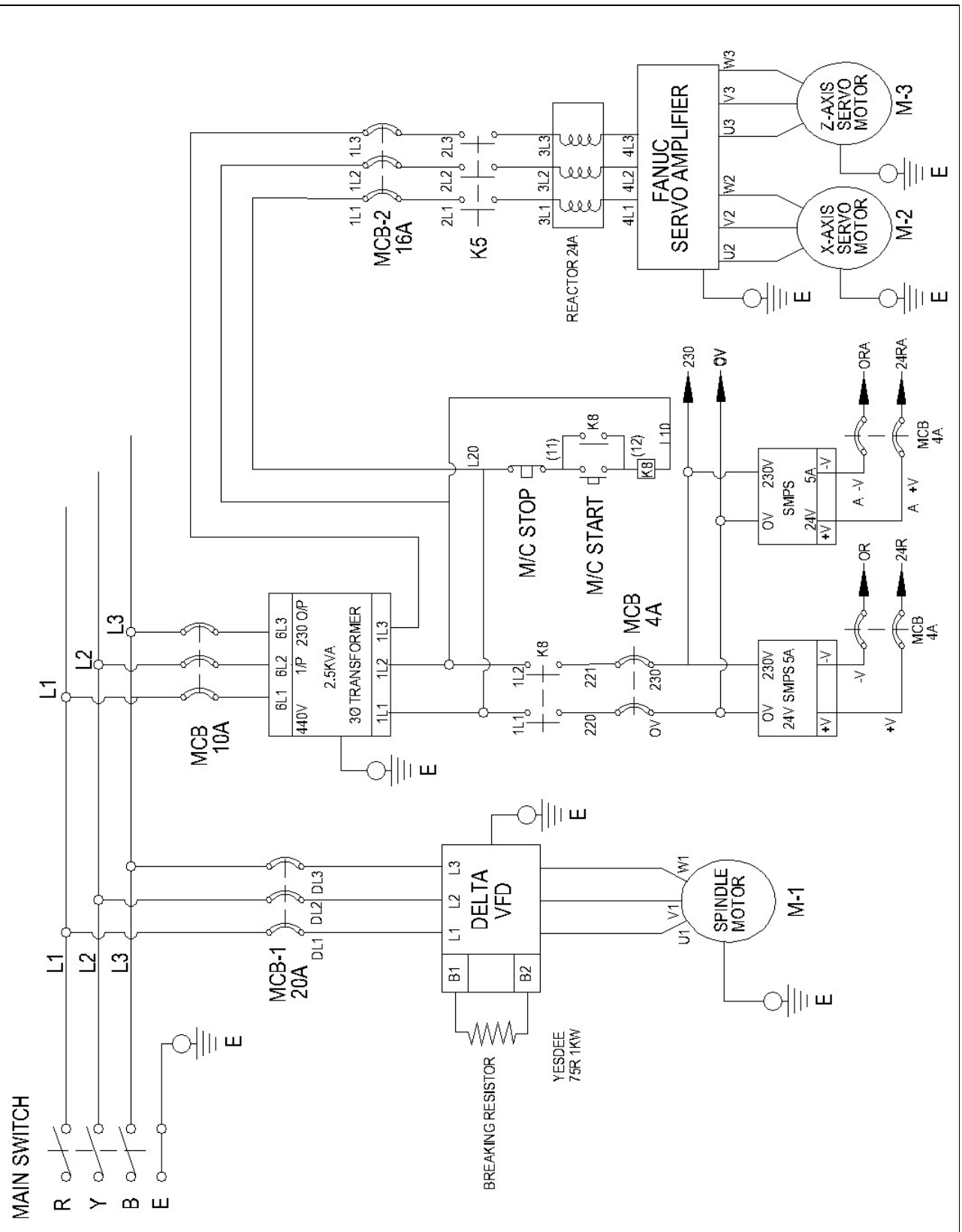
code	name	quantity	position
NN3032K	Double-row radial ball bearing	1	Before Spindle
7020C	Angular contact ball bearing	2	After Spindle
6205	Single-row radial ball bearing	2	Encoder
6013	Single-row radial ball bearing	2	Spindle belt wheel
6008	Single-row radial ball bearing	4	Clutch gear
6307	Single-row radial ball bearing	1	shaft II
6206	Single-row radial ball bearing	1	Shaft II
6207	Single-row radial ball bearing	2	Shaft Ⅲ
6208	Single-row radial ball bearing	5	Shaft II Ⅲ IV
6308	Single-row radial ball bearing	1	Shaft IV

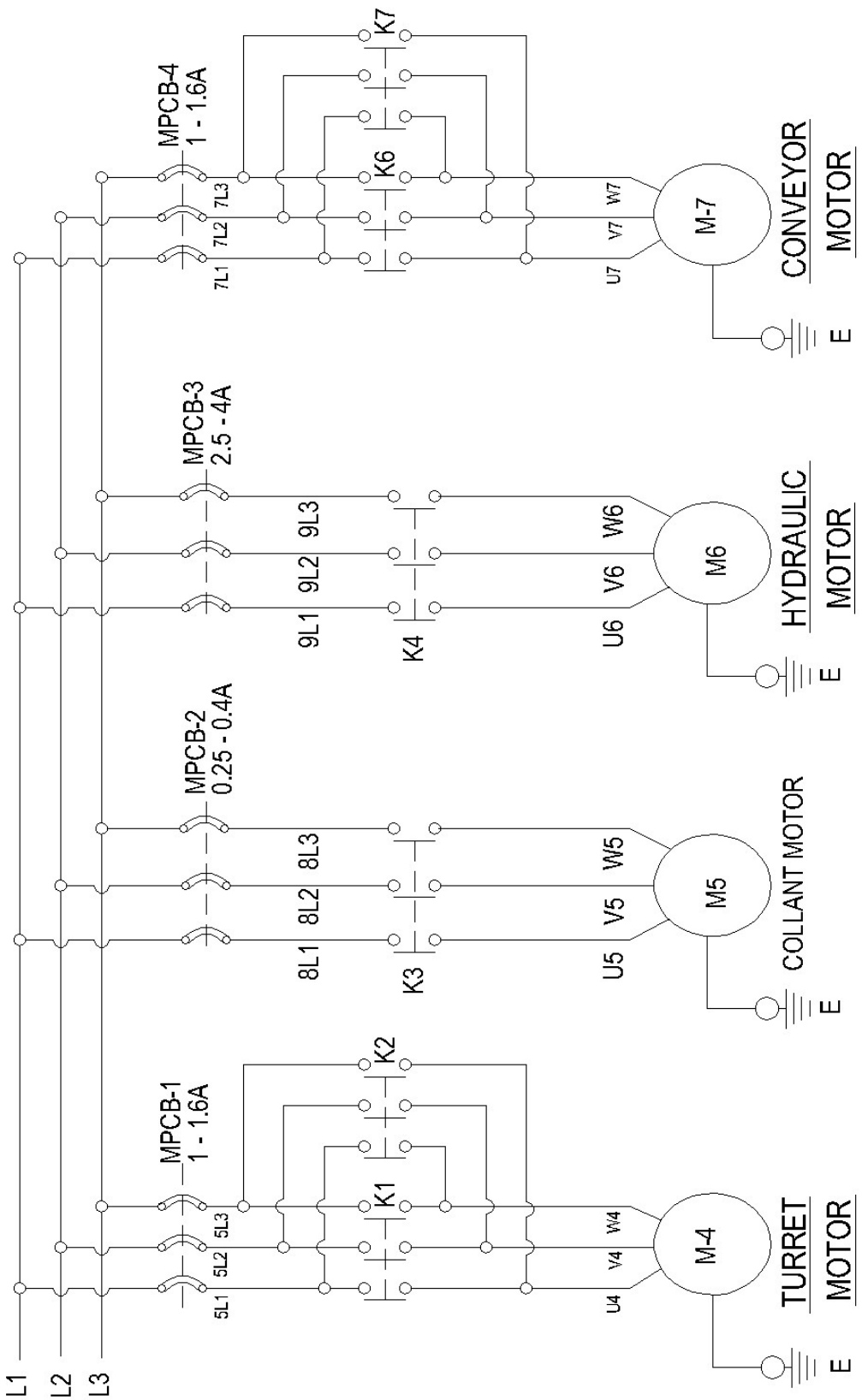
name	specification	note
main power	3-50H±10% AC380V	
total capacity	Kw	
rated current of main fused mass	A	
AC control voltage	AC110V	
DC control voltage	DC24V	
lightning voltage of machine	AC220V	

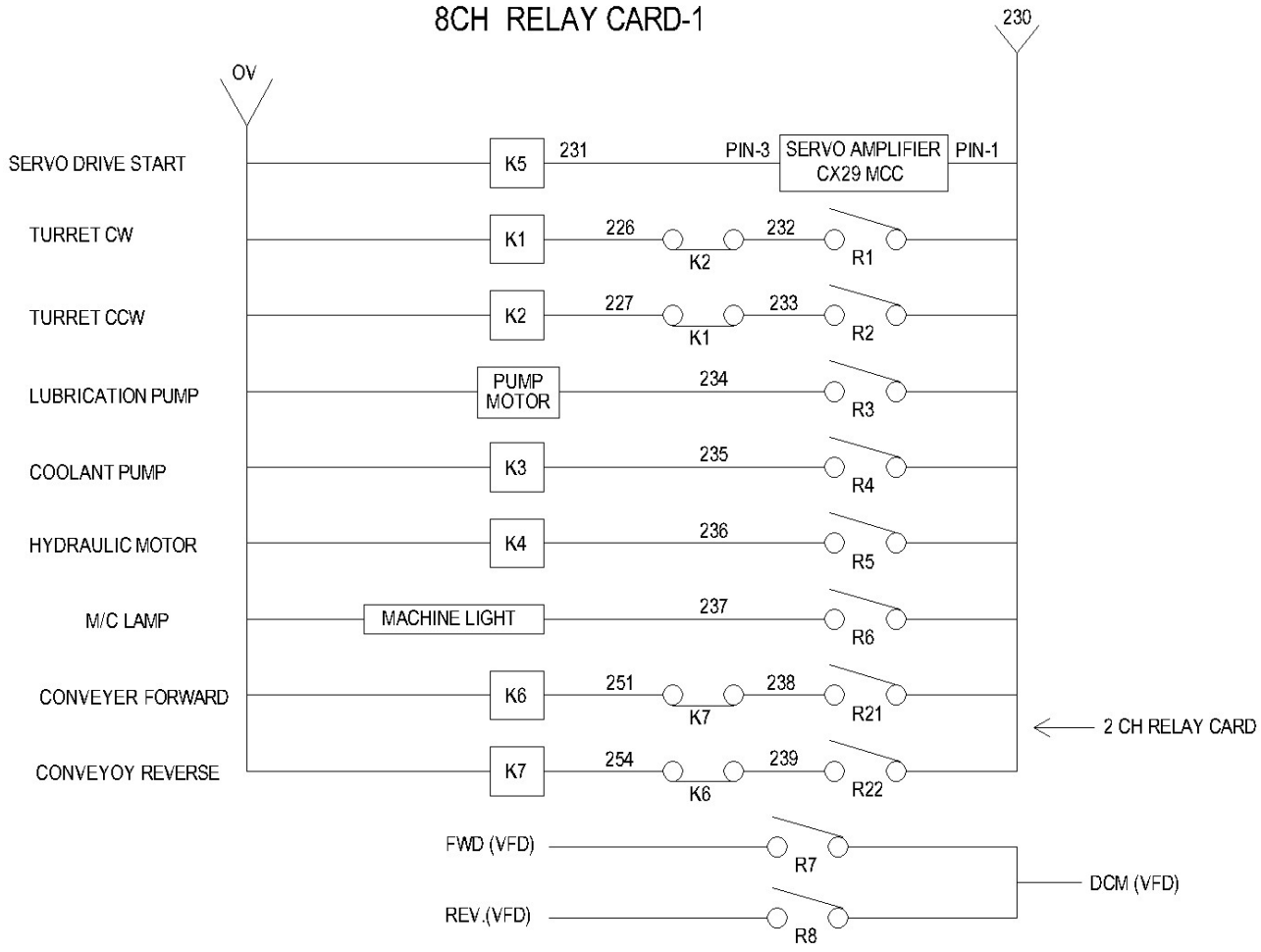
12.2 electrical appliance list

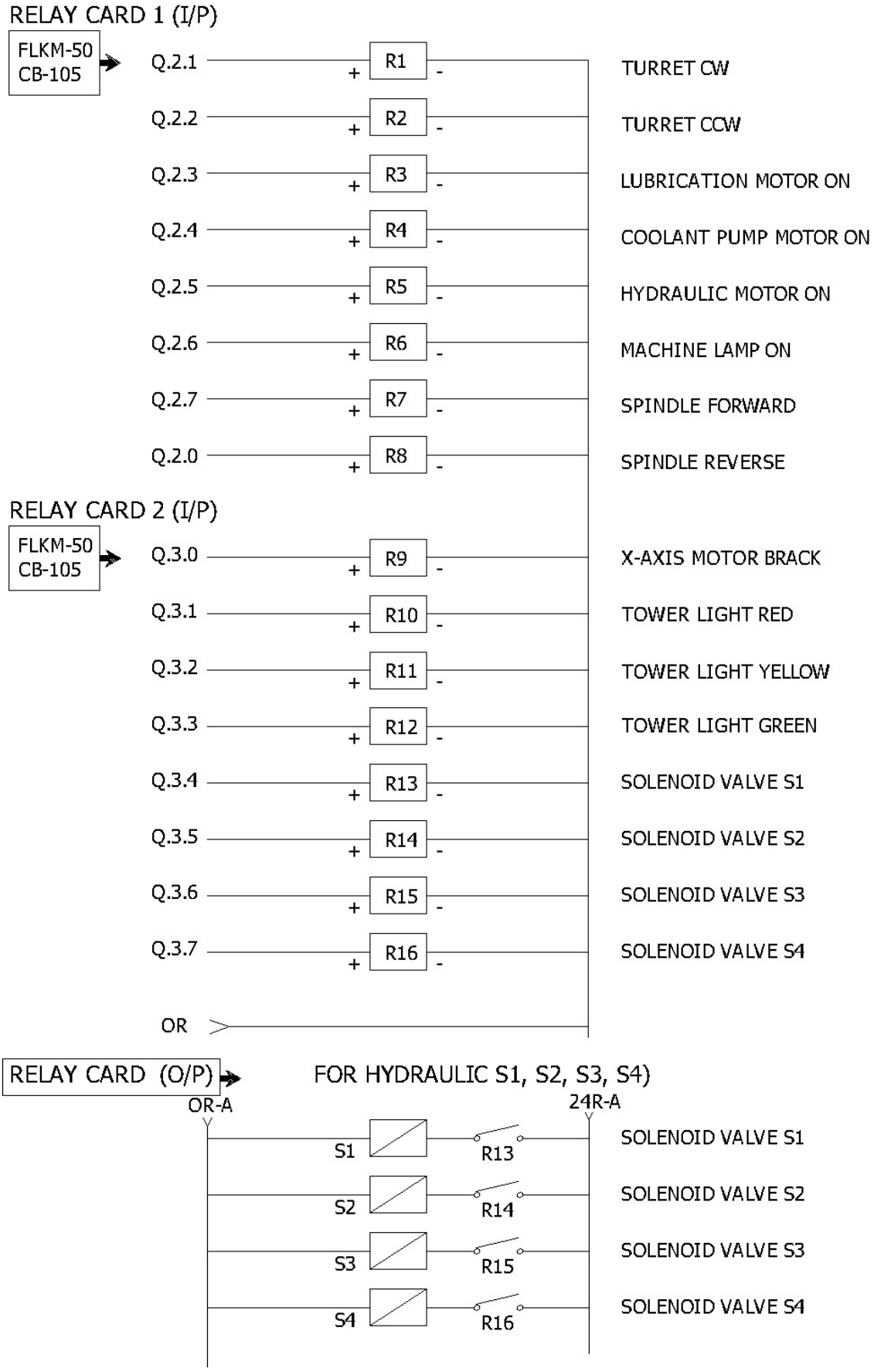
No.	name	spesification	quantity	note
1	breaker	DZ15-40/3902		
2	breaker	OSMC32N1D3		
3	breaker	OSMC32N1D6		
4	breaker	OSMC32N2D10		
5	breaker	OSMC32N3D6		
6	relay	RXM2LB2BD		
7	relay	RXM4LB2BD		
8	AC contactor	SIEMENS 3TB40		
9	AC contactor	SIEMENS 3TB42		
10	AC contactor	SIEMENS 3TB44		
11	electric detent	ZD-15		
12	button	Green SA16		
13	botton	Red SA16		
14	Emergency switch	LAY3		
15	arc distinguisher	single phase		
16	arc distinguisher	three phase		
17	VC	30A		
18	fan	125/220V		
19	transformer	250W-110V/27V		

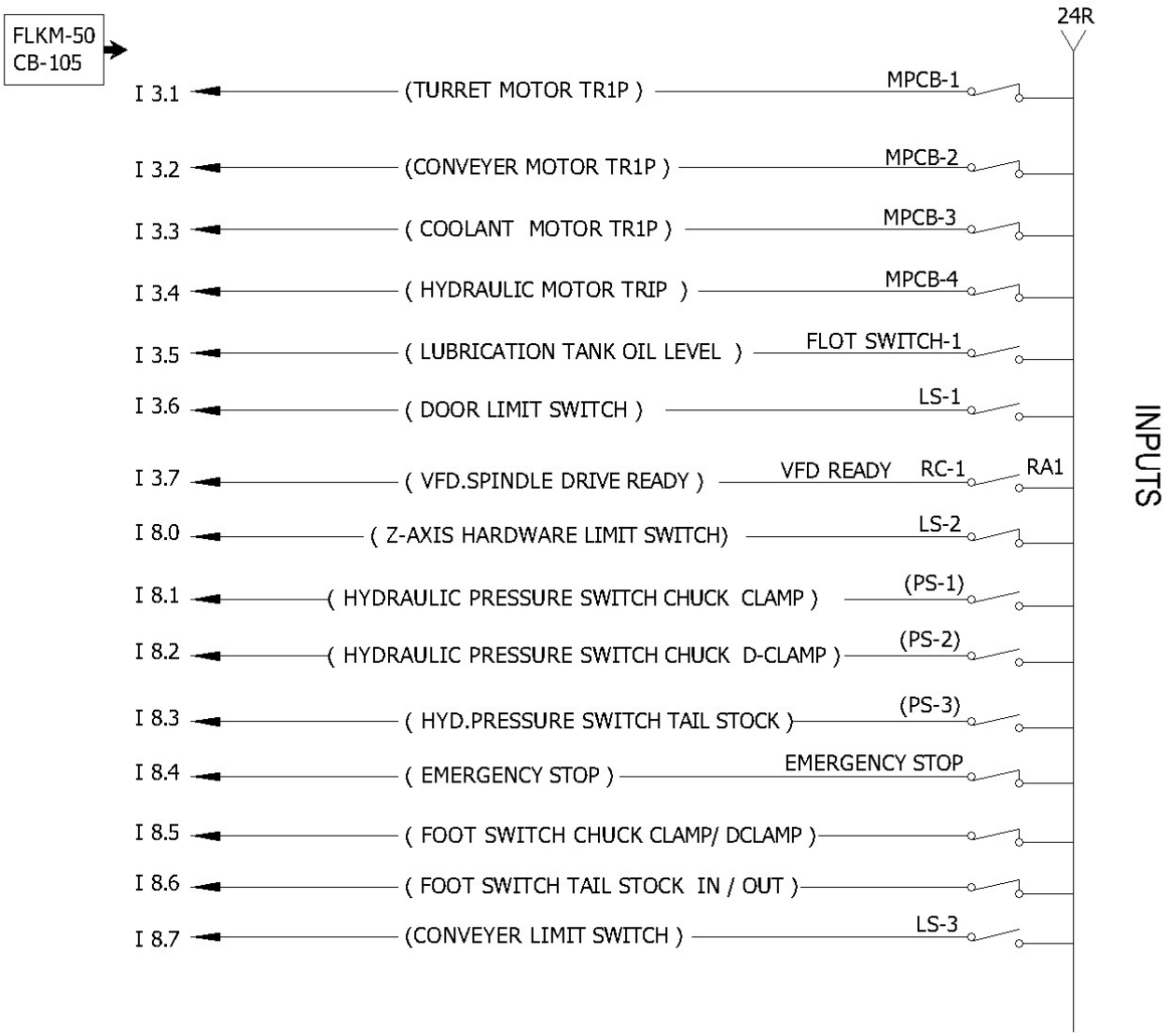
Wiring Dia Gram section

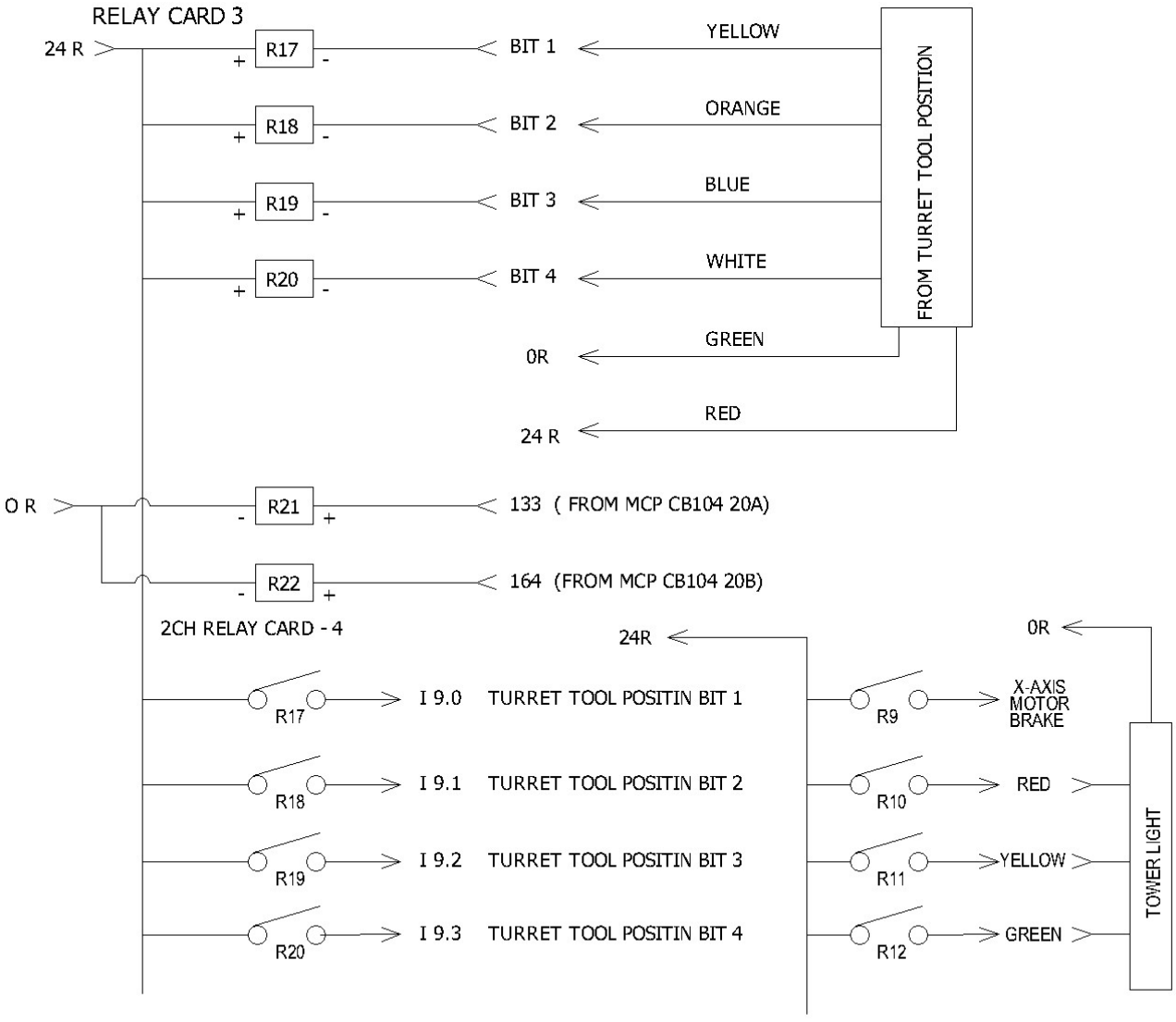

MAIN SWITCH
R
Y
B
E
L1
L2
L3
E
MCB-1
20A
DL1
DL2
DL3
DELTA
VFD
L1
L2
L3
B1
B2
BREAKING RESISTOR
YESDEE
75R 1KW
U1
V1
W1
SPINDLE
MOTOR
M-1
MCB
10A
6L1
6L2
6L3
440V
1/P
230 O/P
2.5KVA
3Ø TRANSFORMER
1L1
1L2
1L3
MCB
4A
K8
1L1
1L2
220
221
230
0V
M/C START
M/C STOP
L20
(11)
(12)
K8
L10
230
0V
MCB-2
16A
1L1
1L2
1L3
K5
2L1
2L2
2L3
REACTOR 2MA
3L1
3L2
3L3
FANUC
SERVO AMPLIFIER
4L1
4L2
4L3
U2
V2
W2
U3
V3
W3
X-AXIS
SERVO
MOTOR
M-2
Z-AXIS
SERVO
MOTOR
M-3
E
0V
230V
24V SMPS 5A
-V
+V
SMPS
5A
A -V
A +V
ORA
24RA
OR
24R
MCB
4A

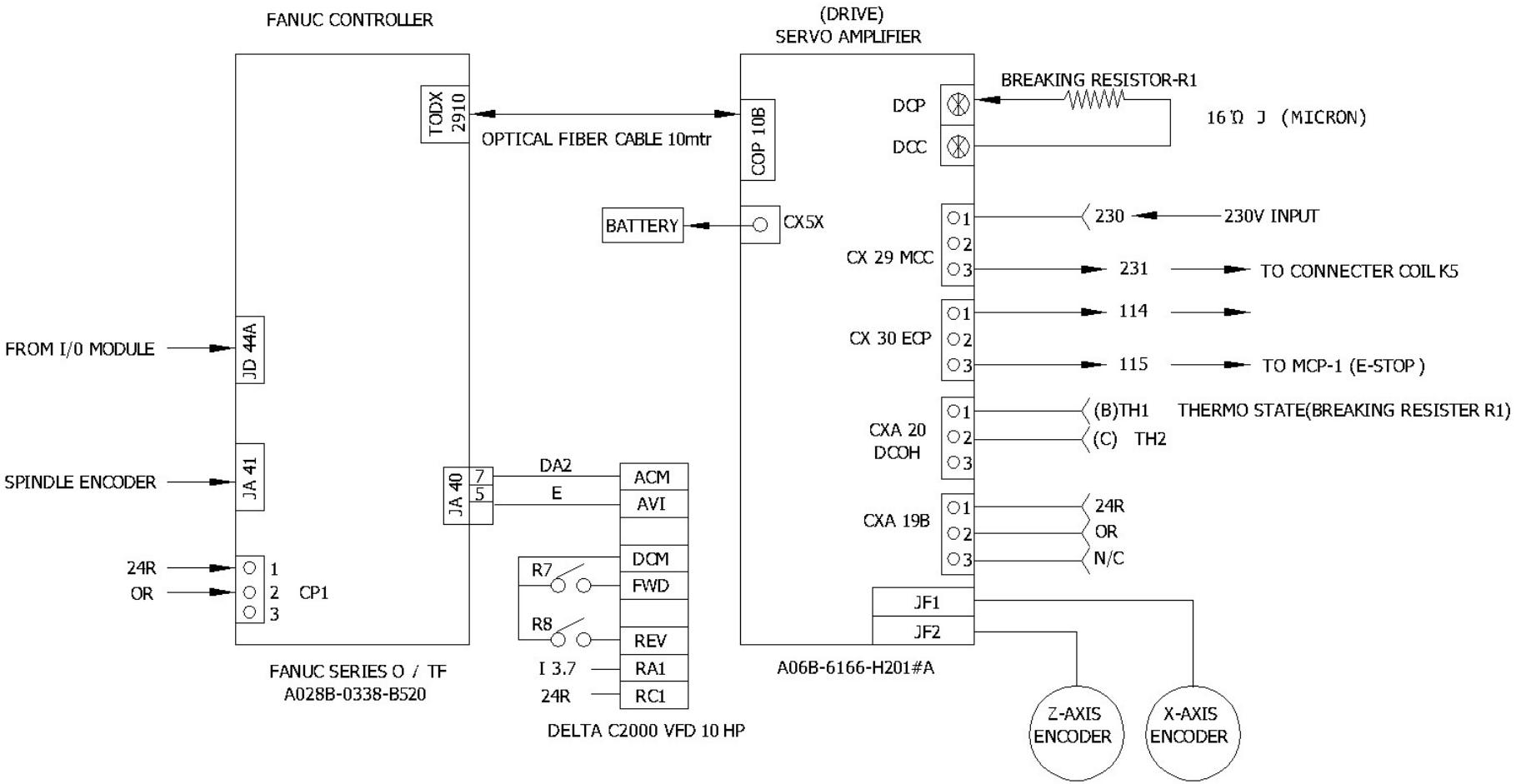

L1
L2
L3
MPCB-1
1 - 1.6A
5L1
5L2
5L3
K1
K2
U4
V4
W4
M-4
E
TURRET MOTOR
MPCB-2
0.25 - 0.4A
8L1
8L2
8L3
K3
U5
V5
W5
M5
E
COLLANT MOTOR
MPCB-3
2.5 - 4A
9L1
9L2
9L3
K4
U6
V6
W6
M6
E
HYDRAULIC MOTOR
MPCB-4
1 - 1.6A
7L1
7L2
7L3
K6
K7
U7
V7
W7
M-7
E
CONVEYOR MOTOR


8CH RELAY CARD-1
230
0V
SERVO DRIVE START
K5
231
PIN-3
SERVO AMPLIFIER CX29 MCC
PIN-1
TURRET CW
K1
226
K2
232
R1
TURRET CCW
K2
227
K1
233
R2
LUBRICATION PUMP
PUMP MOTOR
234
R3
COOLANT PUMP
K3
235
R4
HYDRAULIC MOTOR
K4
236
R5
M/C LAMP
MACHINE LIGHT
237
R6
CONVEYER FORWARD
K6
251
K7
238
R21
2 CH RELAY CARD
CONVEYOY REVERSE
K7
254
K6
239
R22
FWD (VFD)
R7
REV.(VFD)
R8
DCM (VFD)


RELAY CARD 1 (I/P)
FLKM-50
CB-105
Q.2.1
R1
TURRET CW
Q.2.2
R2
TURRET CCW
Q.2.3
R3
LUBRICATION MOTOR ON
Q.2.4
R4
COOLANT PUMP MOTOR ON
Q.2.5
R5
HYDRAULIC MOTOR ON
Q.2.6
R6
MACHINE LAMP ON
Q.2.7
R7
SPINDLE FORWARD
Q.2.0
R8
SPINDLE REVERSE
RELAY CARD 2 (I/P)
FLKM-50
CB-105
Q.3.0
R9
X-AXIS MOTOR BRACK
Q.3.1
R10
TOWER LIGHT RED
Q.3.2
R11
TOWER LIGHT YELLOW
Q.3.3
R12
TOWER LIGHT GREEN
Q.3.4
R13
SOLENOID VALVE S1
Q.3.5
R14
SOLENOID VALVE S2
Q.3.6
R15
SOLENOID VALVE S3
Q.3.7
R16
SOLENOID VALVE S4
OR
RELAY CARD (O/P)
FOR HYDRAULIC S1, S2, S3, S4)
OR-A
24R-A
S1
R13
SOLENOID VALVE S1
S2
R14
SOLENOID VALVE S2
S3
R15
SOLENOID VALVE S3
S4
R16
SOLENOID VALVE S4


FLKM-50
CB-105
24R
I 3.1
(TURRET MOTOR TR1P)
MPCB-1
I 3.2
(CONVEYER MOTOR TR1P)
MPCB-2
I 3.3
(COOLANT MOTOR TR1P)
MPCB-3
I 3.4
(HYDRAULIC MOTOR TRIP)
MPCB-4
I 3.5
(LUBRICATION TANK OIL LEVEL)
FLOT SWITCH-1
I 3.6
(DOOR LIMIT SWITCH)
LS-1
I 3.7
(VFD.SPINDLE DRIVE READY)
VFD READY
RC-1
RA1
I 8.0
(Z-AXIS HARDWARE LIMIT SWITCH)
LS-2
I 8.1
(HYDRAULIC PRESSURE SWITCH CHUCK CLAMP)
(PS-1)
I 8.2
(HYDRAULIC PRESSURE SWITCH CHUCK D-CLAMP)
(PS-2)
I 8.3
(HYD.PRESSURE SWITCH TAIL STOCK)
(PS-3)
I 8.4
(EMERGENCY STOP)
EMERGENCY STOP
I 8.5
(FOOT SWITCH CHUCK CLAMP/ DCLAMP)
I 8.6
(FOOT SWITCH TAIL STOCK IN / OUT)
I 8.7
(CONVEYER LIMIT SWITCH)
LS-3
INPUTS


RELAY CARD 3
24 R
R17
BIT 1
YELLOW
R18
BIT 2
ORANGE
R19
BIT 3
BLUE
R20
BIT 4
WHITE
FROM TURRET TOOL POSITION
0R
GREEN
24 R
RED
O R
R21
133 (FROM MCP CB104 20A)
R22
164 (FROM MCP CB104 20B)
2CH RELAY CARD - 4
24R
0R
R17
I 9.0 TURRET TOOL POSITIN BIT 1
R9
X-AXIS MOTOR BRAKE
R18
I 9.1 TURRET TOOL POSITIN BIT 2
R10
RED
R19
I 9.2 TURRET TOOL POSITIN BIT 3
R11
YELLOW
R20
I 9.3 TURRET TOOL POSITIN BIT 4
R12
GREEN
TOWER LIGHT


FANUC CONTROLLER
(DRIVE)
SERVO AMPLIFIER
TODX 2910
OPTICAL FIBER CABLE 10mtr
COP 10B
BREAKING RESISTOR-R1
DCP
DCC
16Ω J (MICRON)
BATTERY
CX5X
230
230V INPUT
CX 29 MCC
231
TO CONNECTER COIL K5
114
CX 30 ECP
115
TO MCP-1 (E-STOP)
(B)TH1
THERMO STATE(BREAKING RESISTER R1)
CXA 20
DCOH
(C) TH2
CXA 19B
24R
OR
N/C
JF1
JF2
FROM I/0 MODULE
JD 44A
SPINDLE ENCODER
JA 41
JA 40
7
5
DA2
E
ACM
AVI
DCM
FWD
REV
RA1
RC1
R7
R8
I 3.7
24R
24R
OR
1
2
3
CP1
FANUC SERIES O / TF
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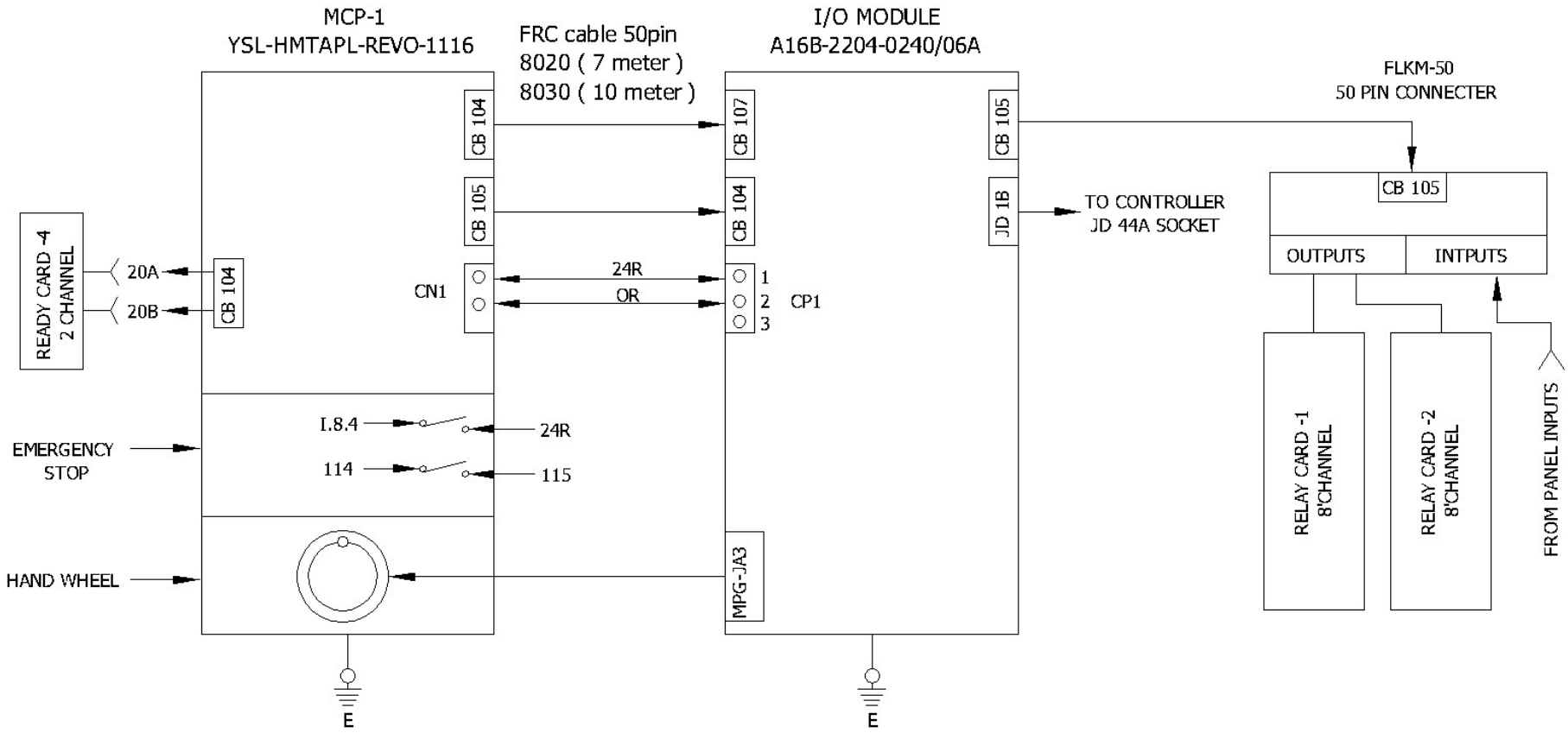
A06B-6166-H201#A
DELTA C2000 VFD 10 HP
Z-AXIS ENCODER
X-AXIS ENCODER


MCP-1
YSL-HMTAPL-REVO-1116
FRC cable 50pin
8020 (7 meter)
8030 (10 meter)
I/O MODULE
A16B-2204-0240/06A
FLKM-50
50 PIN CONNECTER
CB 104
CB 105
CB 107
CB 104
CB 105
JD 1B
CB 105
TO CONTROLLER
JD 44A SOCKET
OUTPUTS
INTPUTS
READY CARD -4
2 CHANNEL
20A
20B
CB 104
CN1
24R
OR
1
2
3
CP1
I.8.4
24R
EMERGENCY
STOP
114
115
HAND WHEEL
MPG-JA3
RELAY CARD -1
8'CHANNEL
RELAY CARD -2
8'CHANNEL
FROM PANEL INPUTS
E
E