VERTICAL

MACHINIG CENTERS

INSTRUCTION MANUAL

MODEL NO: VMC 1250 ……

S/O NUMBER: ……

TYPE OF CONTROLER: ……

SERIAL NUMBER: ……..……...

TEL: FAX:

PREFACE:

We take this opportunity to thank you purchase of this product manufactured by Machine size Tabriz.

Every product we made is the result of ample experience and research over the years conducted by our dedicated team of engineers, and of the incorporation of the ideas and advice given to us by the users.

Notwithstanding, a machine requires proper handling, and its performance and service life are greatly affected by how it is handled and maintained.

We therefore request that you read through. These instructions before you actually use your machine, in order to familiarize yourself with its functions and capabilities and to keep the machine in its best operating conditions.

Please be sure to pay attention to the following before start the machine:

1. Please clear the rust preventing oil completely after unpacked the machine ', and spray the lubricating oil on all the slide ways and all the covers. (Details please see the operation manual).

2. All of fixing part has the red color for distinguishing and the fixing part must be removed before start the machine.

Otherwise, the machine accuracy may be affected and damaged'!!

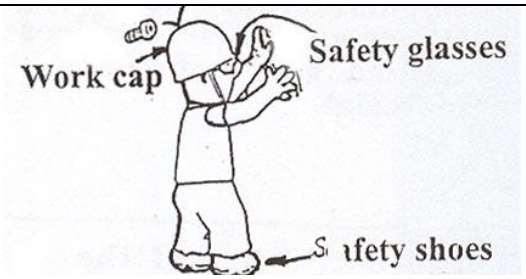
CONTENTS

IV. MAINTENANCE

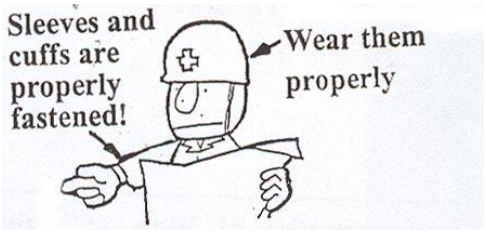
I. PRECAUTIONS REGARDING SAFETY

The safety precautions listed below are intended to prevent human injury or mechanical damage caused by accidents. These precautions apply to the setup and operation of the main unit and of devices, so operators should read them carefully and make sure they are put into practice, rather than relying solely on safety devices themselves.

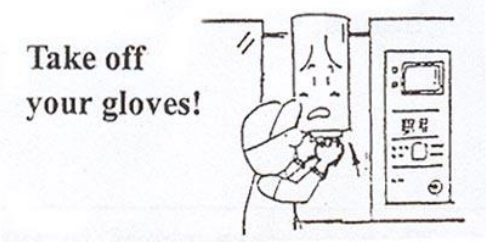
OVERALL SAFETY PRECAUTIONS



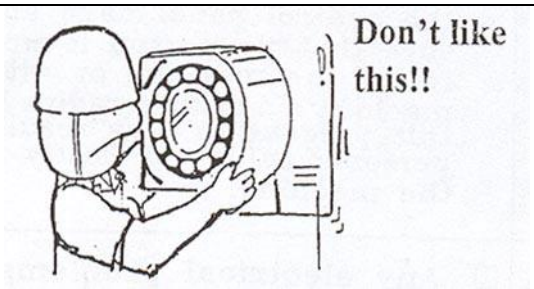
□ When working, wear protective protective clothing appropriate for safety (safety shoes, work cap, safety, etc.)



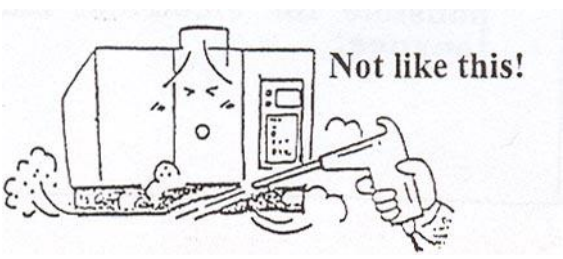
□ Make sure your work cap is wom properly, and that your sleeves and cuffs are properly fastened. Wear the proper clothes for working.



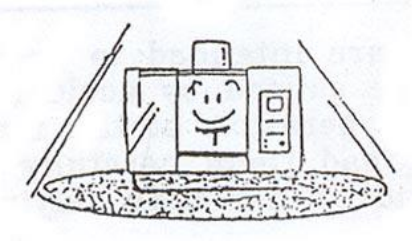
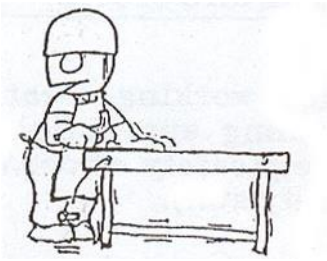
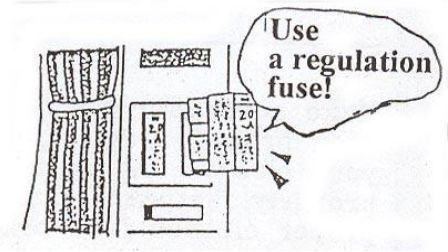
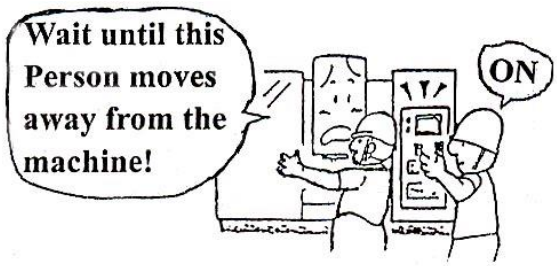
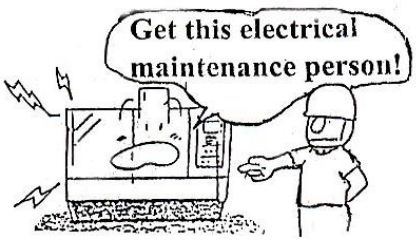
□ Do not wear gloves when operating the equipment.

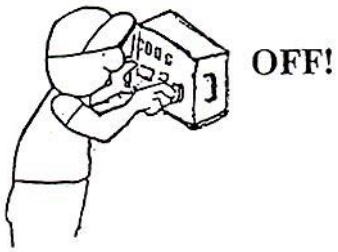


□ Never remove safety devices or safety covers from the equipment.



□ The main unit, power control board, NC equipment and the floor around the equipment should be kept free of dust and chippings. Avoid using compressed air to clean the equipment and area.

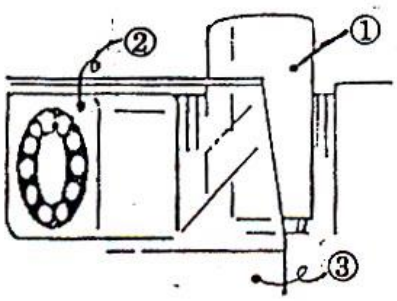
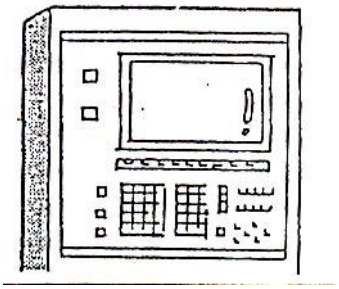
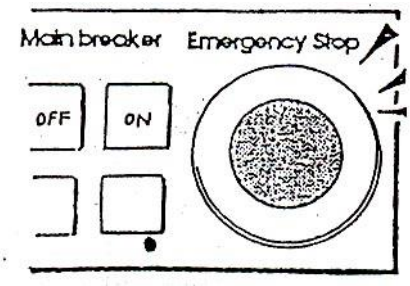
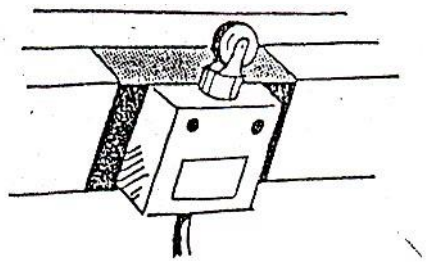
	□ Make sure the area around the equipment is adequately illuminated and is dry. Keep the area organized so there are no obstacles lying around on the floor. The surroundings shound be neat and clean.
	□ Workbenches set up near the equipment must be strong and sturdy and their surfaces treated with non-skid material.
	□ Use only fuses of the specified rating
	□ Be careful of high voltages. Never torch switches with wet hands.
	□ When you are, about to turn ON the power or to operate any controls on the control panel, make absolutely sure that no person is working inside the machine or within the machine's working radius. Disregarding this precaution may result in serious to the machine.
	□ Any electrical problems should be handled by the person responsible for electrical maintenance.



□ When replacing fuses, turn off the main power supply first.

SAFETY DEVICES

The following devices are provided as standard equipment with this machine, for the safety of the operator and to protect the machine. Never remove or modify these devices. Furthermore, the operator should' never rely solely on these devices for protection when operating the equip ment.

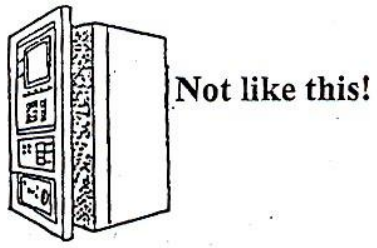
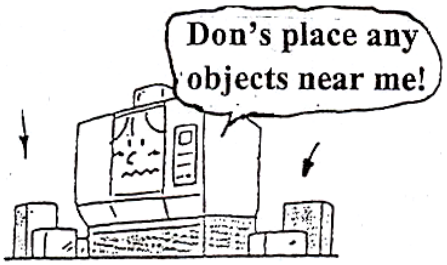
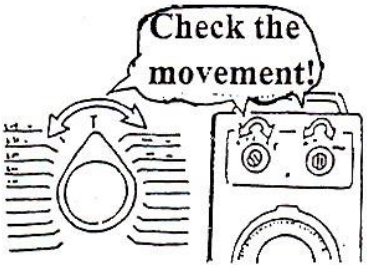
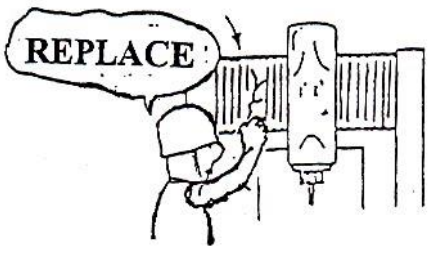
	□ Various safety covers (1) Head cover (2) Magazine cover (3) Splash guard
	□ Do not change the parameters of the stored stroke limits.
	□ push button switch for emergency stop.
	□ Over travel limit switches and dogs and dogs for X,Y, and Z axes.

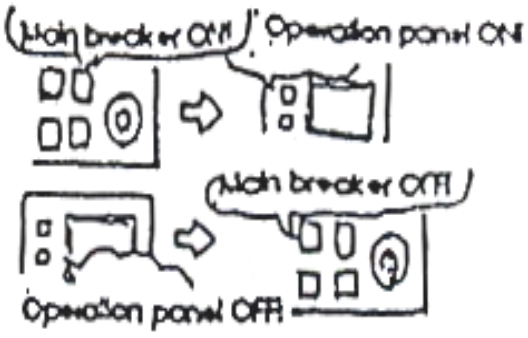
PRECAUTIONS REGARDING OPERATION

Read this manual thoroughly before operating the equipment for the first time. It is recommended that a' serviceman from the manufacturer be present the first time the equipment is operation, you should become familiar with the entire manual before handling the equipment.

PRECAUTIONS FOR OPERATING THE EQUIPMENT SAFETY

Before on power

	□ Check that the doors to the operation and control panels are closed.
	□ Make sure there are no objects lying on the floor around the equipment.
	□ All operation levers and switches should be in good working condition.
	□ Cables should be in good condition. With no cracks or break. Replace tom or broken wipers, bellows and winding covers.

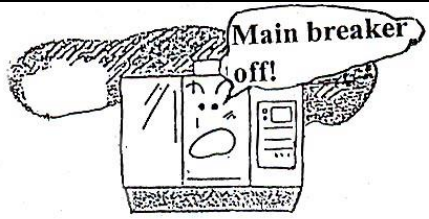


□ power supply

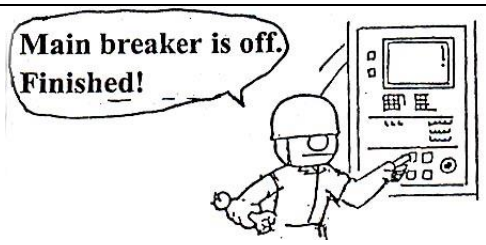
To turn on the power, first set the main break to "NO" and then the power supply switch on the operation panel to " NO" When turning off the power, first turn the power supply switch on the operation panel to "OFF" and then turn off the main breaker.

When turning on: main breaker ON/->
operation panel on/

When turning off: operation panel OFF/->
Main breaker OFF/

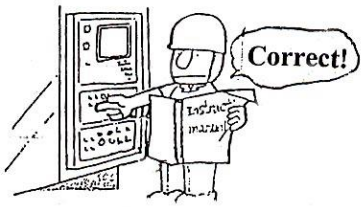


□ When the power is restored after a power failure, immediately turn the main breaker to "OFF" and then turn it back to "ON".



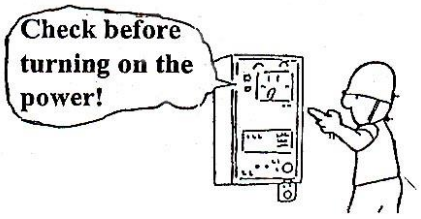
□ When operation is finished, turn off the main breaker if you are going to be away from the machine.

□ Machine oil check Make sure all parts have sufficient oil. (For the lubrication location, oil brands, and the amount of oil to be used, please follow the directions on the label or in the instructions on the label or in the instruction manual).



□ operation

Before operating the equipment, check the functions and operation methods in the instruction manual.



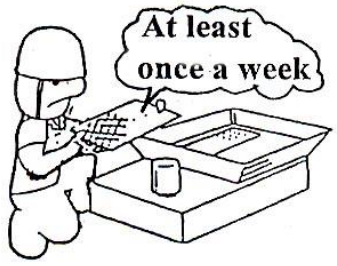
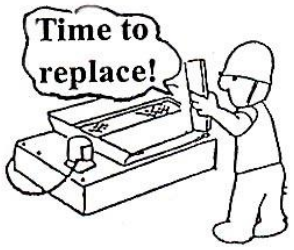
□ Before turning on the power, check the inspection items and operation items.

□ Stopping

Emergency stop button

If you sense danger, press the Emergency stop button immediately.

PRECAUTIONS REGARDING CUTING FLUID

	□ The filter for the coolant tank should be cleaned at least once a week.
	□ Replace cutting fluid whenever necessary.

WARMING UP

In order to keep the equipment in top condition, always follow the warming up procedure before beginning operation every day. Warming up is also effective for achieving stable precision with the material being processed.

For an example of programming for warming up, please reader to "630FU Operator's Manual Additional Data."

Warming up time	About 30 minutes
Spindle rpm	Half of maximum rpm
Travel- stroke	Stroke of each axis
ATC magazine operation	Include in program

CAUTION

- During the warming-up operation, check the lubrication condition and the movement of each section of the machine.

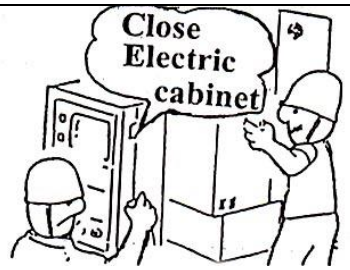
- If the unit has not been used for a long period of time, carry out a dry run of the ATC operation.

- Make sure there is a tool in the spindle when rotating the spindle.

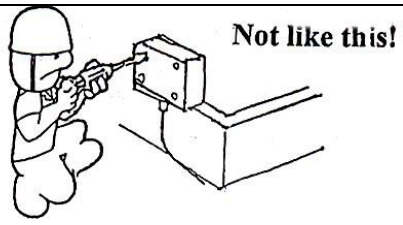
PRECAUTIONS REGARDING MAINTENANCE

□ Operators or maintenance personnel should read the caution plates attached to the machine carefully and observe these cautions at all times. Be careful that caution plates do not get dirty, scratched, or detached from the machine. If caution plates become hard to read for any reason, please contact us for replacement.

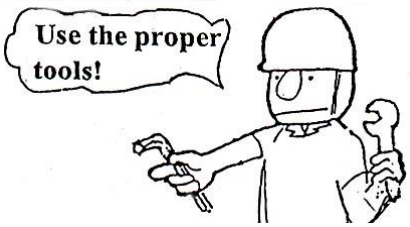
□ Before performing maintenance work on the machine, especially inside the splash guard or at the top or rear of the machine, shut off the power by first turning off the power switch on the control panel, then moving the main breaker on the power box to the "OFF" side. Check carefully to make sure everything is off before begging the work. Aloe, poet warning signs to keep other people from turning on the power by mistake at this, time.



□ All doors and covers should remain closed except when adjustments are being carried out Be especially careful with regard to the doors of the control box and the operation box.

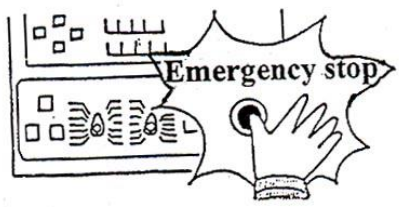
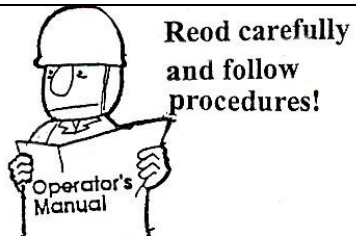
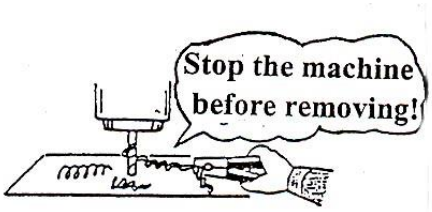
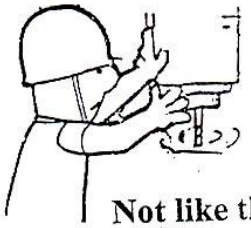
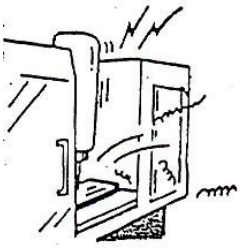


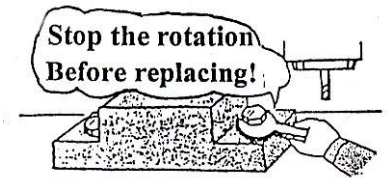
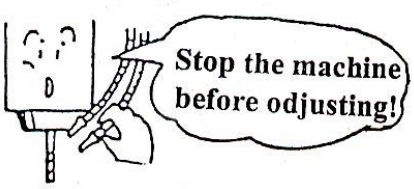
□ Never remove or modify the limit switches for stroke over travel of traveling axes, or the mechanism and electrical circuits installed for safety.



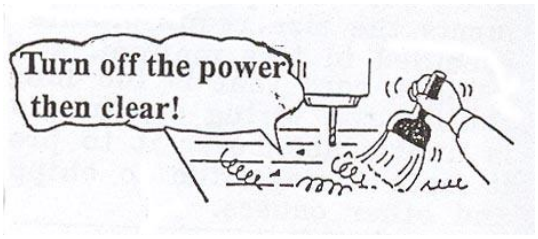
□ Use the specified spanners and wrenches for adjustments and repairs.

PERCAUTIONS REGARDING OPERATION

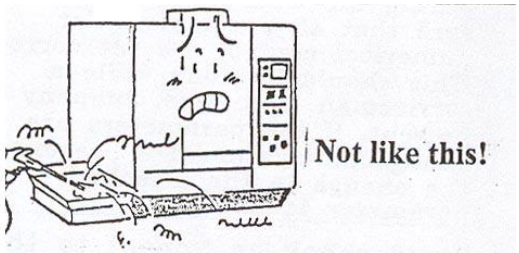
	□ Be completely familiar with the position of the Emergency Stop button so that you can press it instantly if necessary.
	□ Follow the procedures outlined in the manual to start up the equipment.
	□ When removing clippings that have adhered to tools have faller onto the work table, it is dangerous to pick them up and pull them towards, you with your hand Before removing these chippings, turn off the machine and make sure all rotating and moving parts have stopped.
	□ During operation, keep your hands and away from the spindle, ATC, magazine and other moving ' parts.
	□ Never operate the machine without safety covers in place.

	□ When attaching or removing work pieces from a machine which is not equipped with a pallet changer, stop. The rotation of the tool and stay as far away from the tool as possible.
	□ Do not adjust the position of the coolant nozzle until you have stopped all rotating and moving parts.

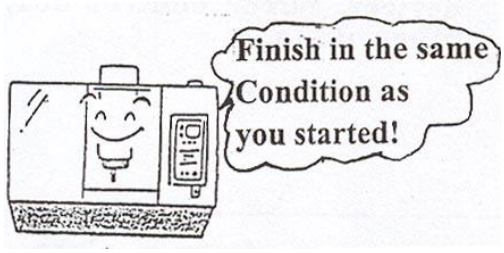
PRECAUTIONS WHEN WORK IS FINISHED



□ When work is finished, always turn off the power in the specified sequence and clean all sections of the machine, especially the sliding surfaces. When using a water-soluble cutting fluid, this is Particularly important.



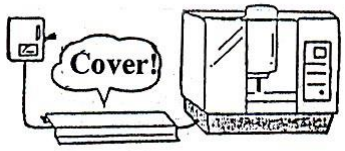
□ Do not use an air gun for cleaning the mac hine.



□ Check to make sure that each part is in the same condition it was in when operation was begun.

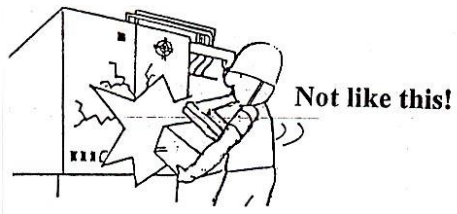
PRECAUTIONS REGARDING ELECTRICAL EQUIPMENT AND NC DEVICES

When handling electrical equipment or NC devices, please pay particular Attention to the following items.

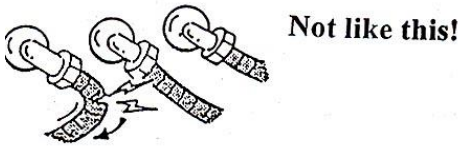


□ Make sure the primary wiring meets the size requirements specified in this manual. Avoid using a cord that is too long. If routing the wiring on the floor is unavoidable, cover it to protect it from damage due to chippings and other causes.

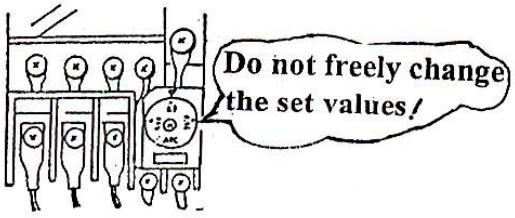
□ During the trial run, check to be sure that all parameters for numerical control are set correctly .This should be done while a serviceman from this company Is present. If the parameters are changed, always make a record of the change in the attached Parameter table.



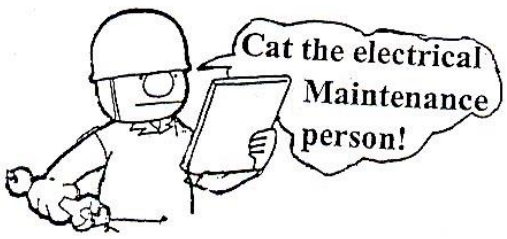
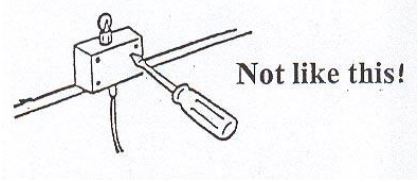
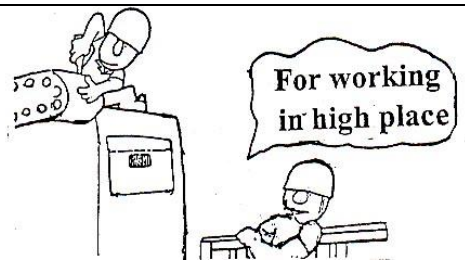
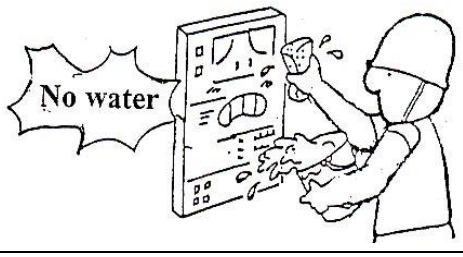
□ Avoid shock or impact to the NC devices, power control box, and other units.

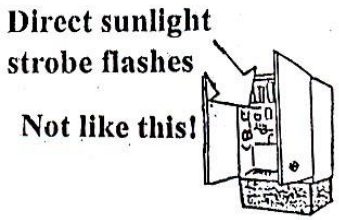
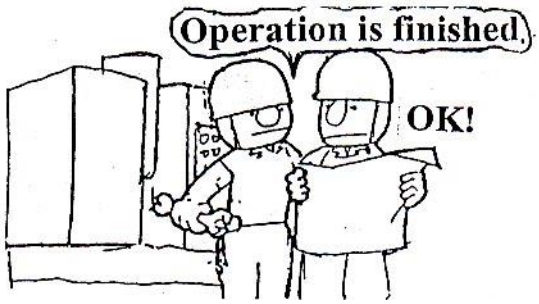


□ Connectors of canon plugs, flexible tube, and tough rubber sheathed cables should be relaxed, but should not be forced to bend.



□ When you wish to change the values which have been set for the current of the thermal relay or other set values in the power control panel, please consult with this company.

	□ Maintenance of electrical equipment, including the primary wiring, should be carried out by the person responsible for such work, or by another person who is qualified to carry out the work safely..
	□ Before doing a maintenance inspection of the electrical equipment, turn off the power supply in the following order. 1) Power supply on the operation panel, 2) main breaker in the control box, 3) power switch in the plant electrical system. Double check that everything is turned off before beginning servicing.
	□ Never remove or modify limit switches for over travel or for safety interlock, proximity switches, or any other parts related to these.
	□ When working in a high place, use a ladder or a stand that meets safety requirements, and always wear a helmet.
	□ Handle all electrical equipment of the main unit with care, to prevent shorts and broken or disconnected wires. Always keep the equipment dry.
	□ Always use the electrical components that are specified by this company. This appies especially to fuses. Never use fuses that exceed the rated capacity, and avoid using copper wire.

	□ Always keep the doors of NC devices, closed to avoid exposing the interior of the unit to direct sunlight or strobe flashes from cameras, which could damage the equipment.
	□ Results of operations should always be double-checked by a person responsible for maintenance.

II. FOUNDATION AND INSTALLATION

1. CUSTOMER'S NOTES

Machine center is a high precision automatic machine tool controlled by computer. So it can't be treated as a conventional one.

Before it is operated, please be sure to read the maintenance and operating instructions carefully. If any question, please our local distribution service. We will reply you promptly.

1-1 SPECIFICATION of MACHINE

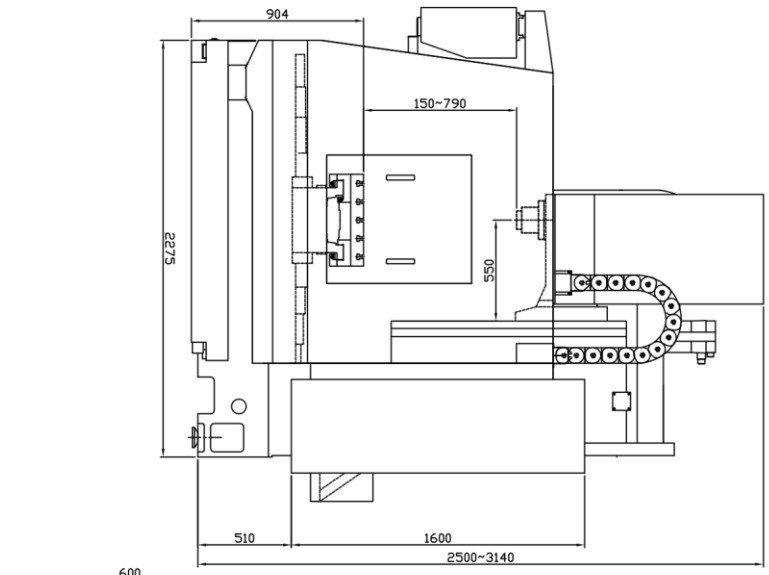
SPECIFICATION		VMC 1250
Table working surface		1220mmX500mm
Longitudinal travel (X)		1143mm
Cross travel (Y)		530mm
Vertical travel (Z)		640mm
Spindle nose to table		150mm-790mm
Spindle center to column		550mm
Spindle taper		BT40
Spindle speed		60-8000rpm
Spindle motor		9 / 12 KW Hi – Lo gear box
X-Y-Z Rapid traverse		18/18/15 M/min
Cutting feed		1-8000mm/min
Coolant pump motor		GRUNDFOS 0.46KW (3.1m3/h)
Tool selection		Bi Direction random type, shortest path
No. of tools		24
Adjacent pockets max. tool dia.		90mm
Max. tool diameter		150mm
Max. tool length		350mm
Max. tool weight		8Kgs
Table load capacity		1500Kgs
Machine weight		6500Kgs
Floor space		2800X3300mm
X-Y-Z Ball screw dia.		40X40X40 mm
Cutting capacity **Ck45N**	milling	180 cc/min
	drilling	Ø40mm
	tapping	M30XP3.5

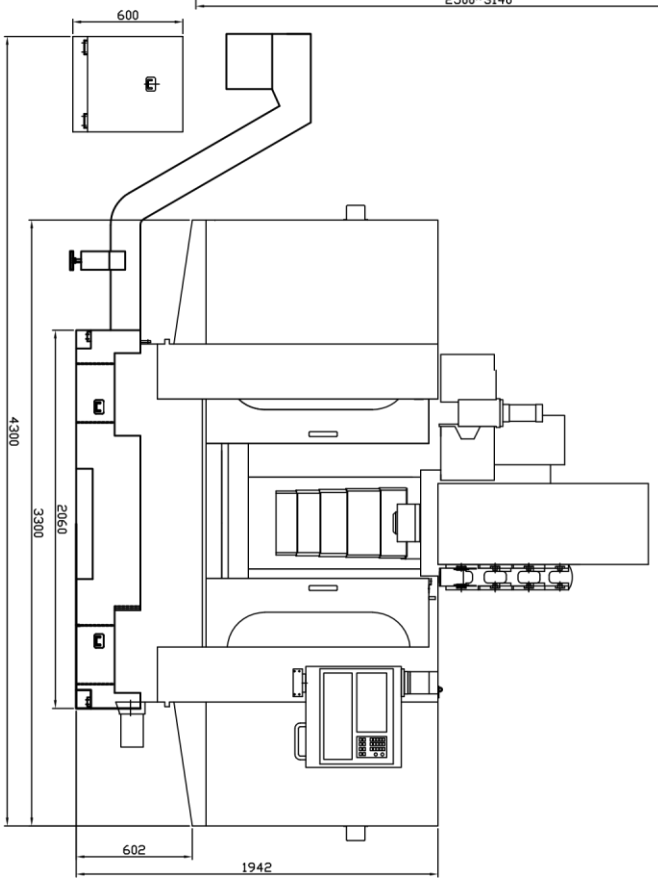
1- 2 MACHINE ACCESSORIES

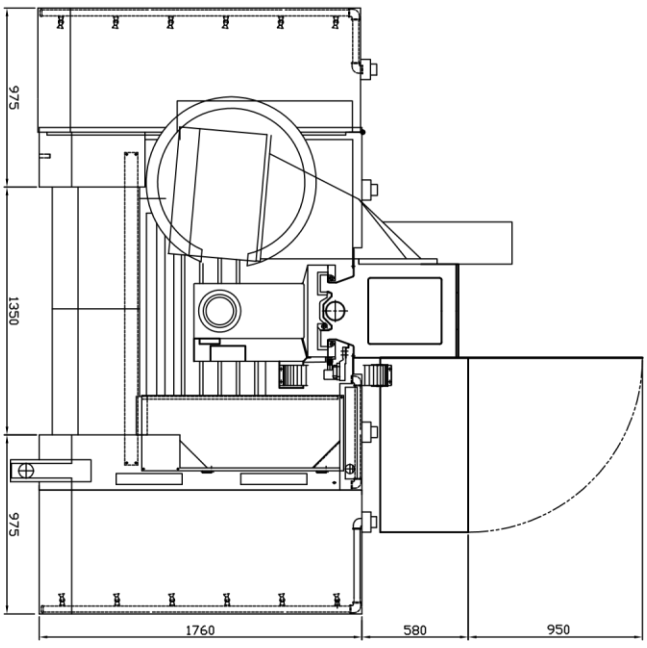
STANDARD ACCESSORIES:

1. Coolant system
2. Spindle air blest
3. Auto lube with alarm
4. Halogen work lamp
5. Tools, tool box and various manuals
6. Chain type chip conveyor
7. Full enclosure splash guard
8. Chip flushing coolant
9. Leveling screws and pads

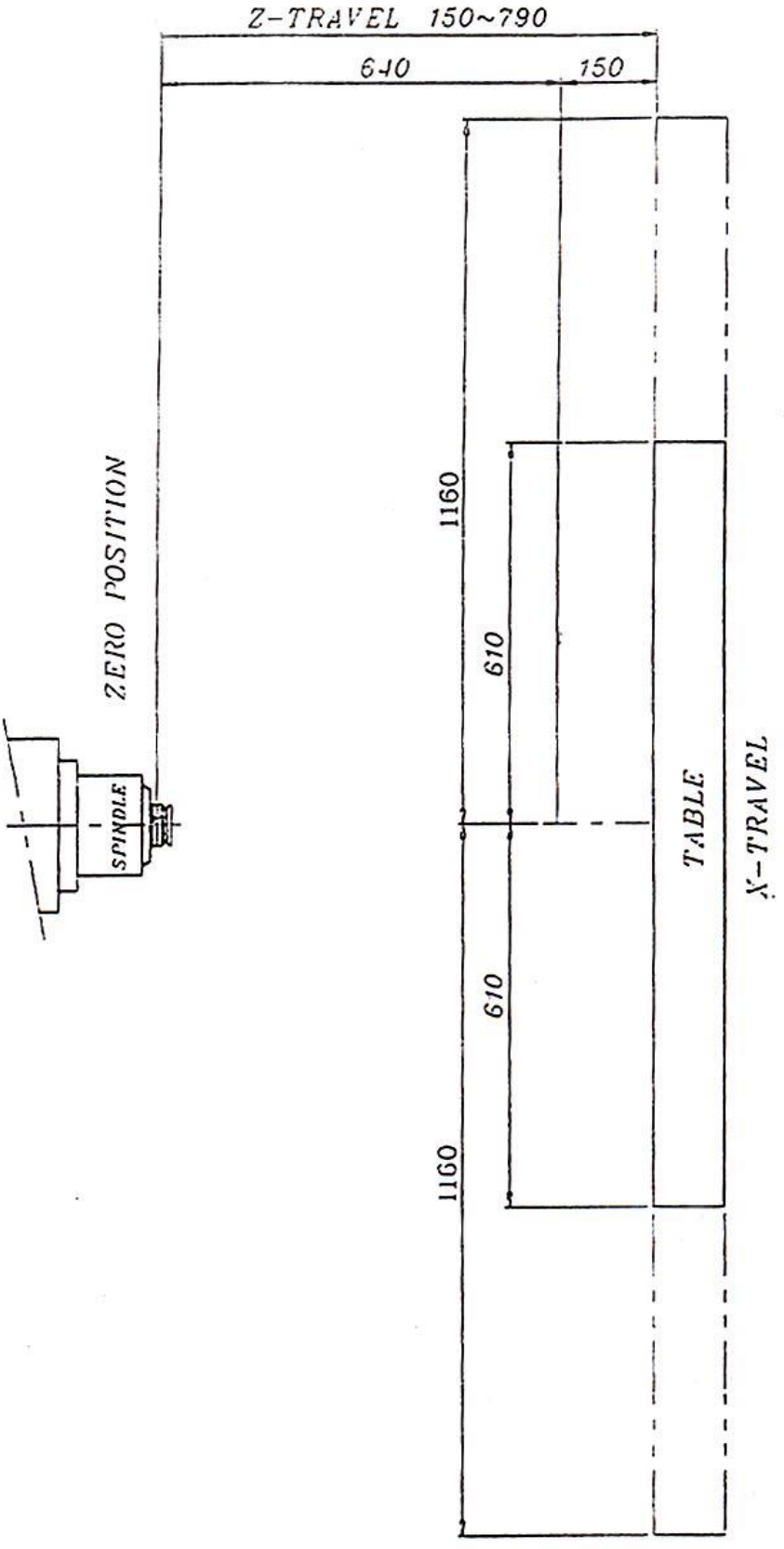
1-3 DIMENSION
VMC 125 FULL ENCLOSURE SPLASH GUARD



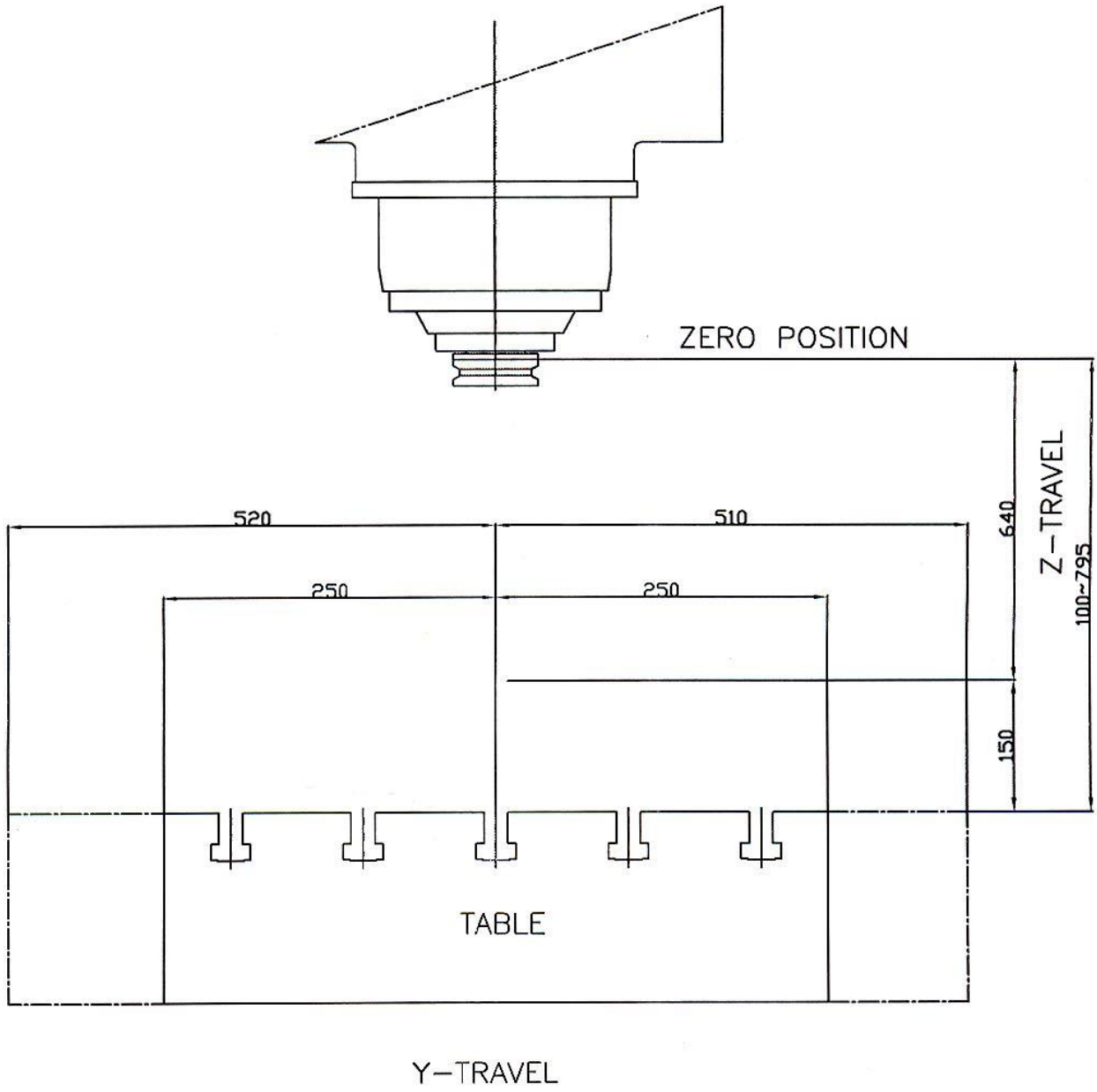




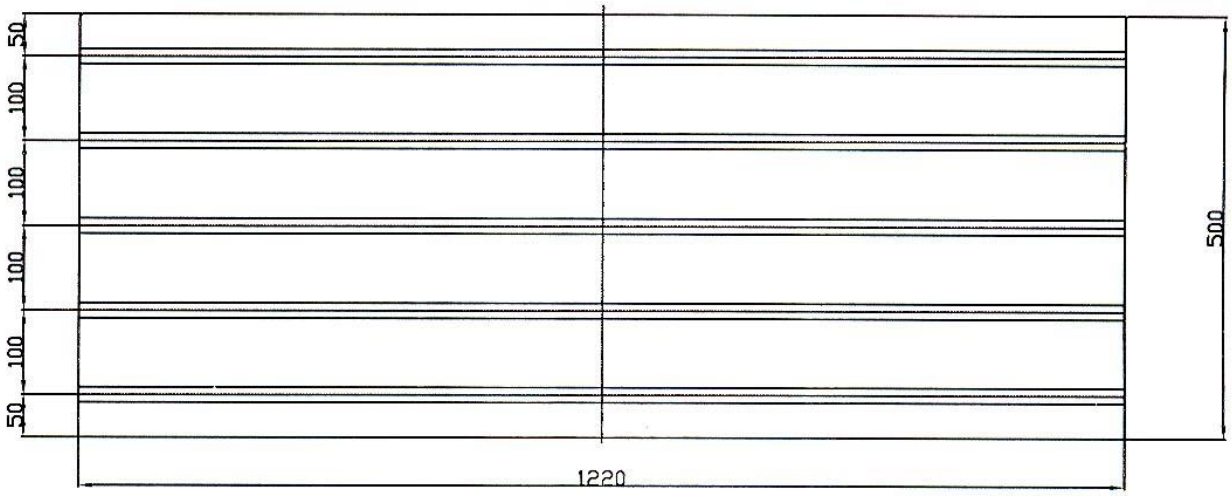
(2) X–Z Axis Travel

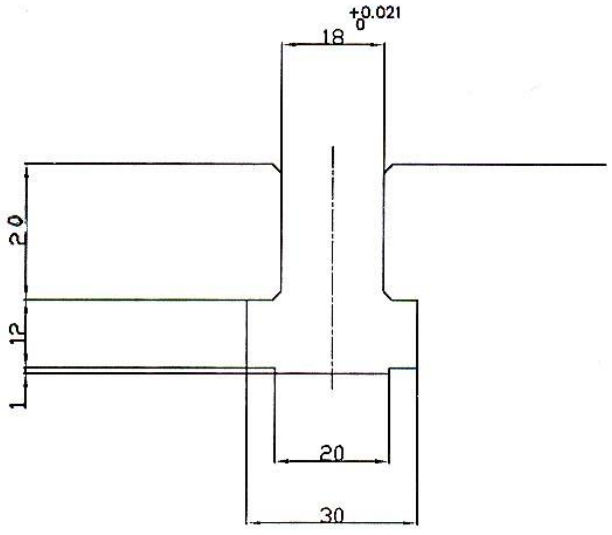


(3) Y–Z Axis Travel

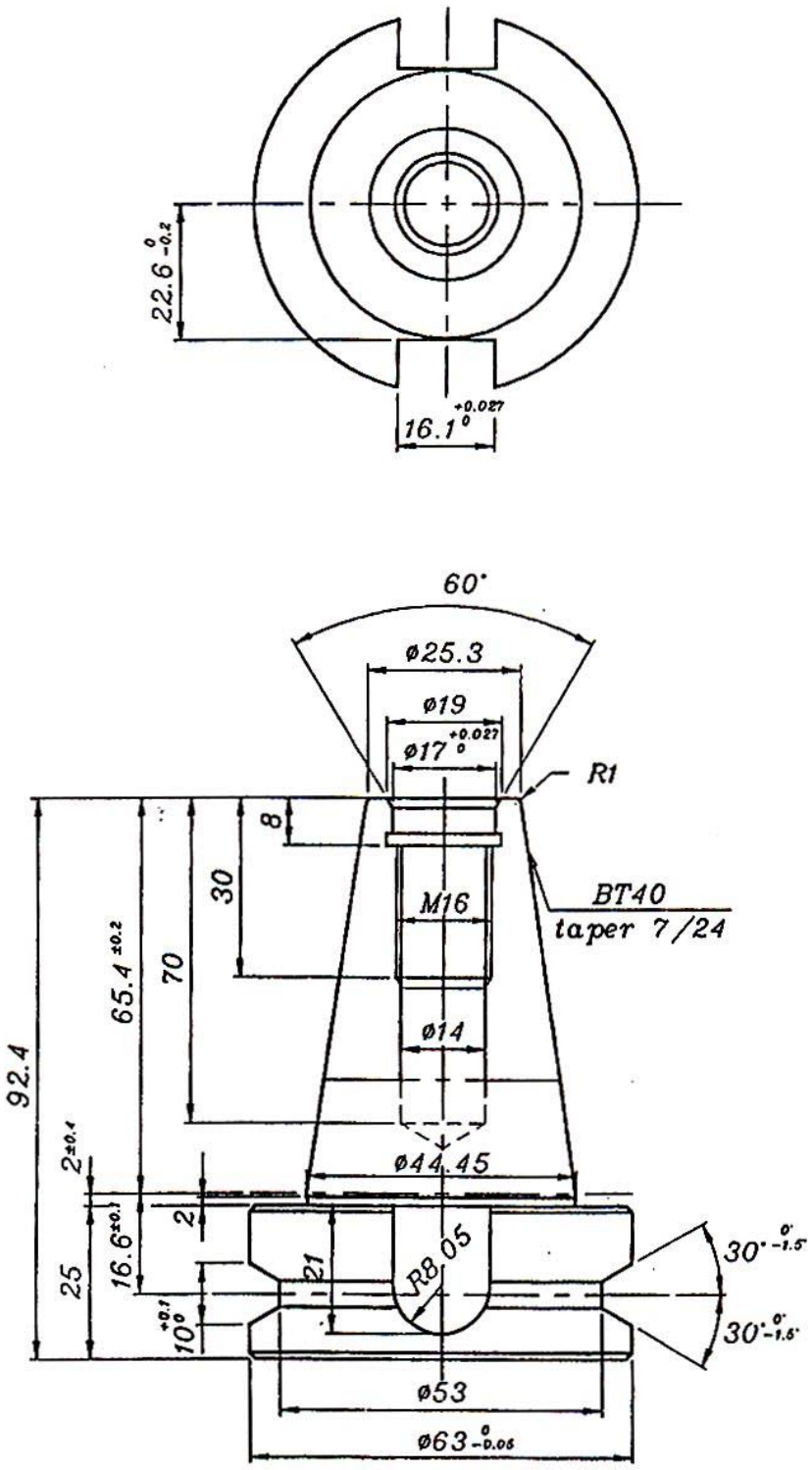


VMC 125 Table&Slot

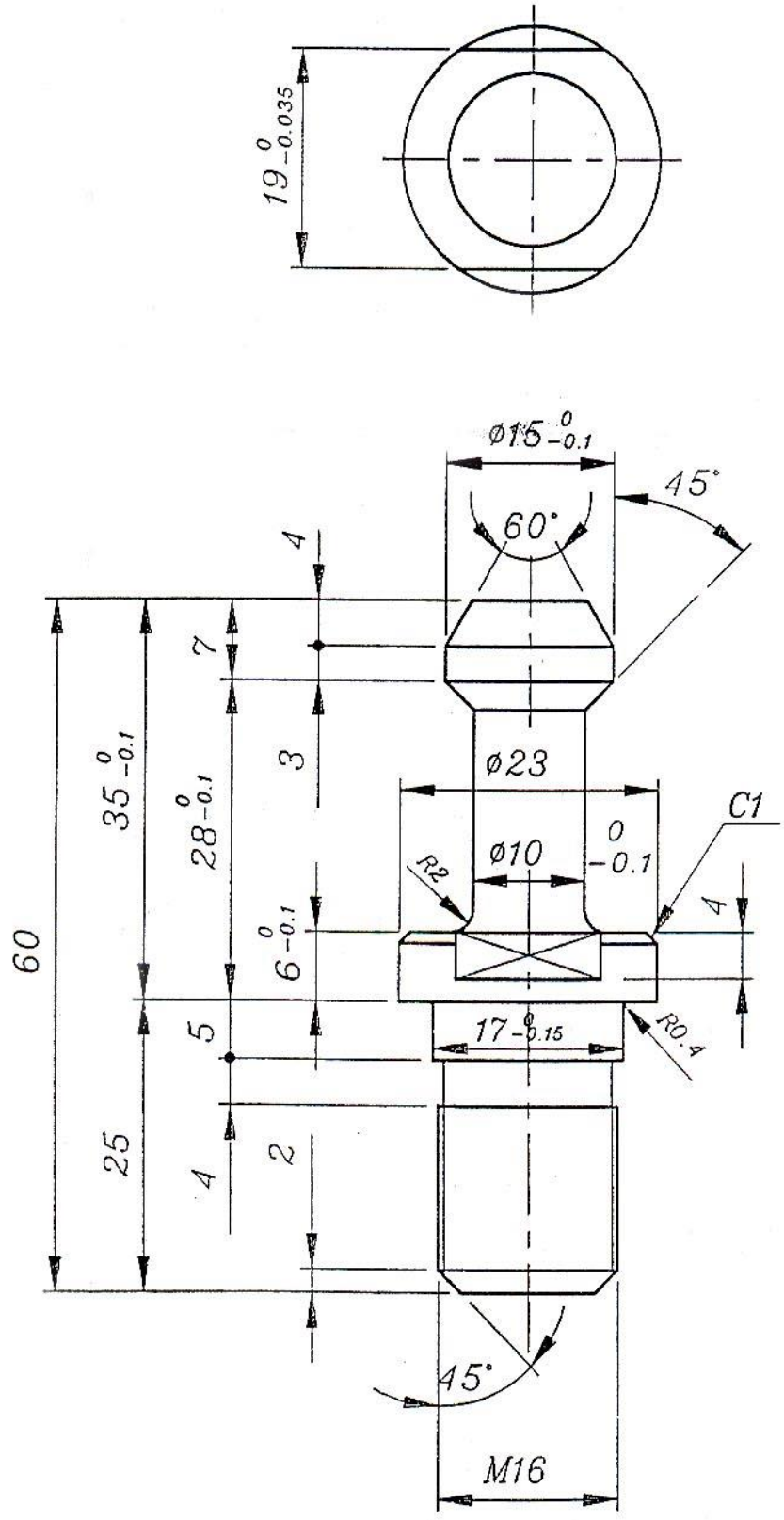




(5) Dimenssions Of BT−40 Tool Shank



(6) BT−40 Pull Stud



2. ESTABLISHMENT OF MACHINE FOUNDATION

1- Explanation of Establishing foundation

Correct foundation is very important for machine. Strong foundation will reduce the vibration of machine to avoid defective function, bolt losing & cracks of foundation or destruction. Otherwise, it will influence the precision of machine.

Because of different machine weights, speeds and vibration force, the design of foundation is also different. So we suggest you to do good foundation. (As fig. 8,9)

For convenience to have a level adjustment and avoid causing any vibration, each machine has adjusting blocks & fixing nails of screw enclosed. And an enclosure will reach you before the machine is submitted.

2. choice of Place for Installing Machine

For Keeping machine life and meeting precise requirements, please choose a suitable place to install the machine. The conditions are as follows:

(1) Choose the place with small vibration and impact force instead of the place with big vibration and impact force to install the machine.

(2) Please don't install the machine and digital controller at the place where the sun shines directly or moisture is too big.

(3) While installing the machine, please keep it away from the place full of powder and corrosive spray.

3. Method of Establishing Foundation:

If necessary, please refer to the foundation figure 8 and start
to construct it 15 days before the machine reaches. The working way is as follows:

(1) Confirm the datum plane of foundation.

(2) Spread out stones for fixed thickness after foundation is dug to the fixed depth and bottom plane is evented. Fill the space with gravels and pound them completely until no space remains for having strong foundation.

(3) According to specified sizes, set the mould frame firmly. It can't curve or protrude.

(4) According to the rate for cement, sand and stone (1:2:4) to make concrete, mix them completely until becoming an uniform color and being full of homogeneous viscosity.

(5) Please reserve 8 spaces for J-type bolt grooves of foundation before pouring concrete.

(6) Remove the mould frame, after concrete gets dry. (4-5 days in summer, 8-10 days in winter) Then fill the space until no space remains.

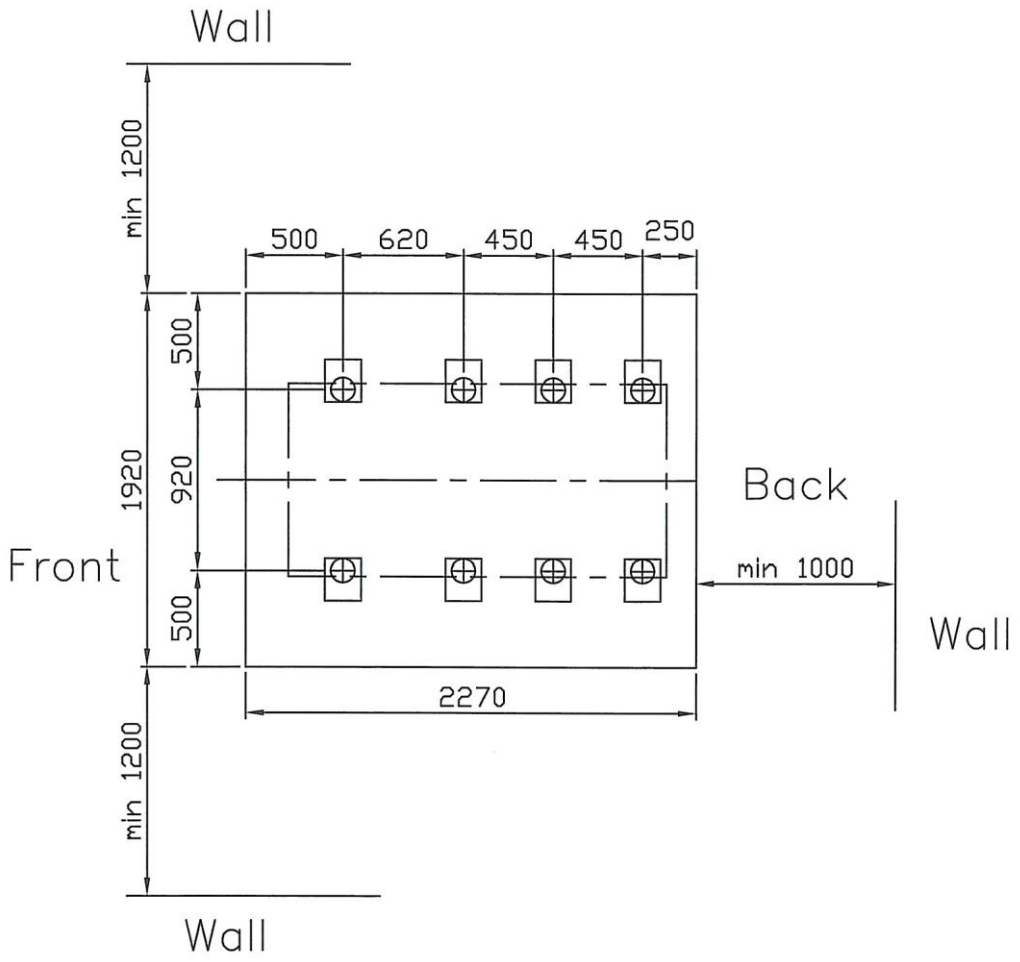
(7) When the machine reaches the destination and preparation is ready, lift up the machine and make J-type bolts of foundation through level adjusting blocks and adjusting screws. Then lock them with packing rings and nuts. Finally, put the machine on the floor slowly.

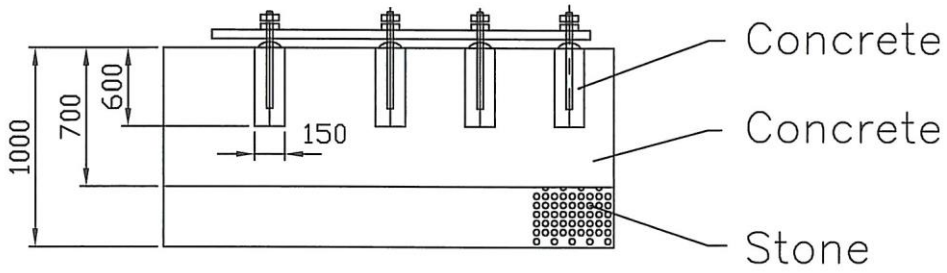
(8) Adjust J-type bolts of foundation at a distance of 150m/m from the floor. After correct adjustment, pour concrete into J-type bolt grooves of foundation.

(9) After concrete gets dry, adjust the level of machine.

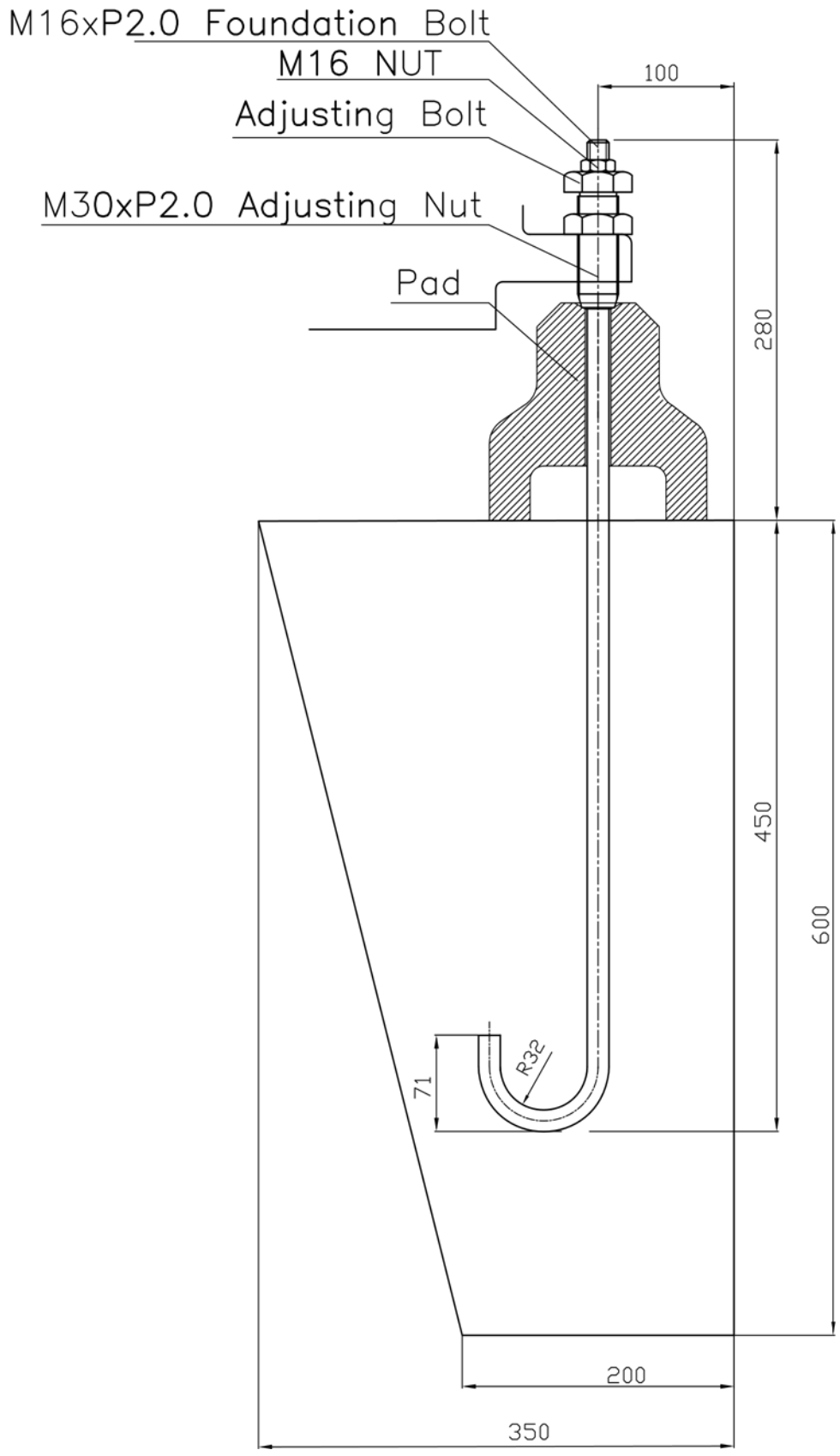
(10) The level adjustment of machine must be made in the 0.02/300mm leve degree or higher precision in the directions of X,Z axis.

VMC 125 Foundation





Foundation Boit



3. PACK I NG AND FIXI NG OF MACHINE

For keeping the quality and precision of machine, we take many protection measurements before packing. And the machine must be approved. by quality control before transportation.

Packing Way for Domestic Sale:

Fix the machine on the bottom plate and cover it with a thick PE bag. The machine will be sealed in the bag. See fig. 10.

Packing Way for Export:

Fix the machine on the bottom plate and seal it with wooden boards. And take the measurements of water proof and leak proof. See fig. 11.

For reducing the vibration of machine during transportation, all of the components which will vibrate will be fixed before packing in the carton to ensure the safety and precision of machine. The fixing ways and positions are as follows: (See fig. 12.)

(a) Fix the fixing seat of x-axis ball screws on saddle right side.
(b) Fix the fixing seat of y-axis ball screws front of base seat.
(c) Fix the fixing seat of z-axis ball screws under the spindle housing by wooden block.
(d) Fix the fixing seat of counter weight block or above the column.
(e) Fix the A.T.C magazine on the tool post left side.
(f) Fix the computer operating box on the operation box fixed part.

All of fixing blocks have the red color for distinguishing.

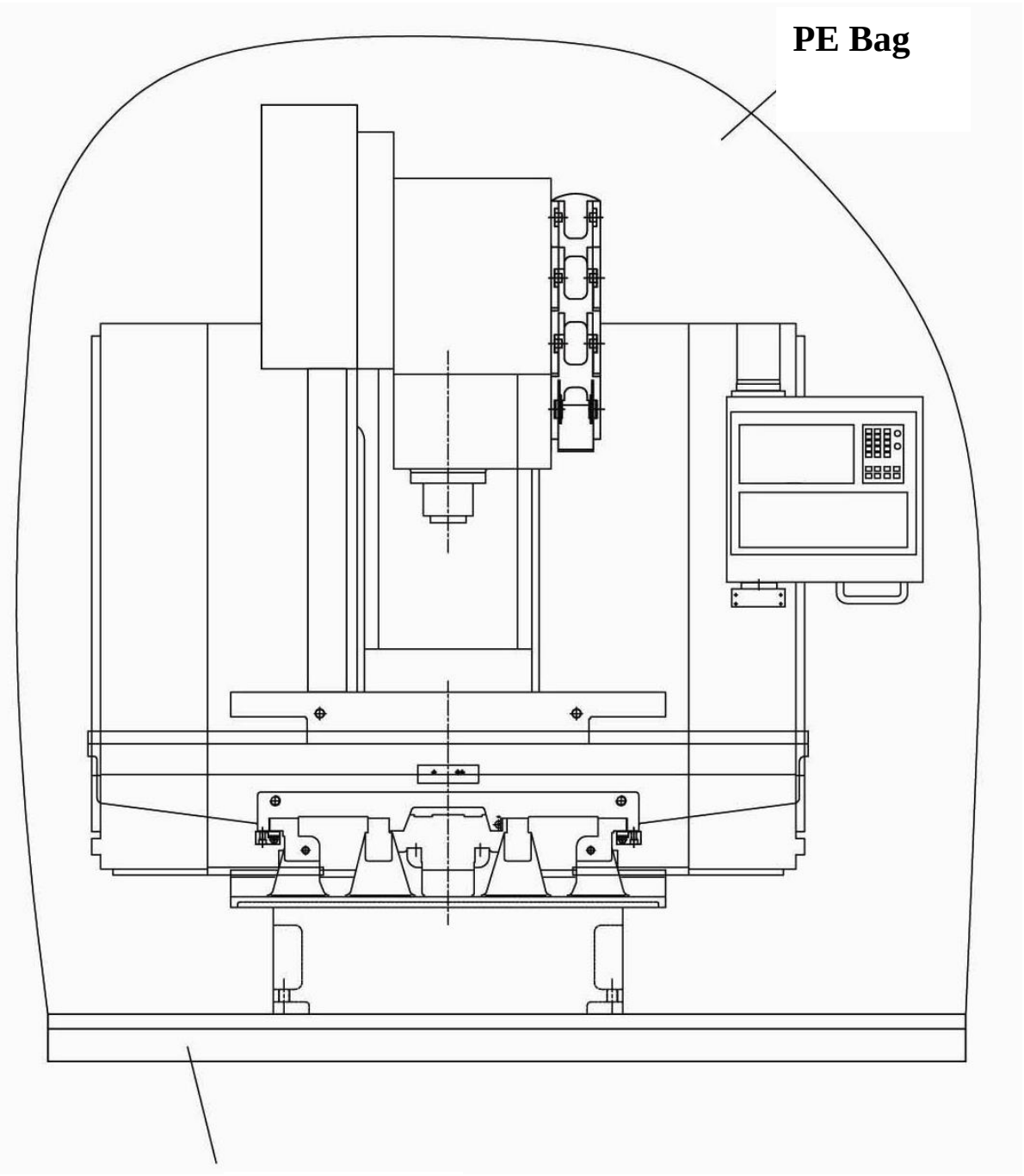


Fig 10

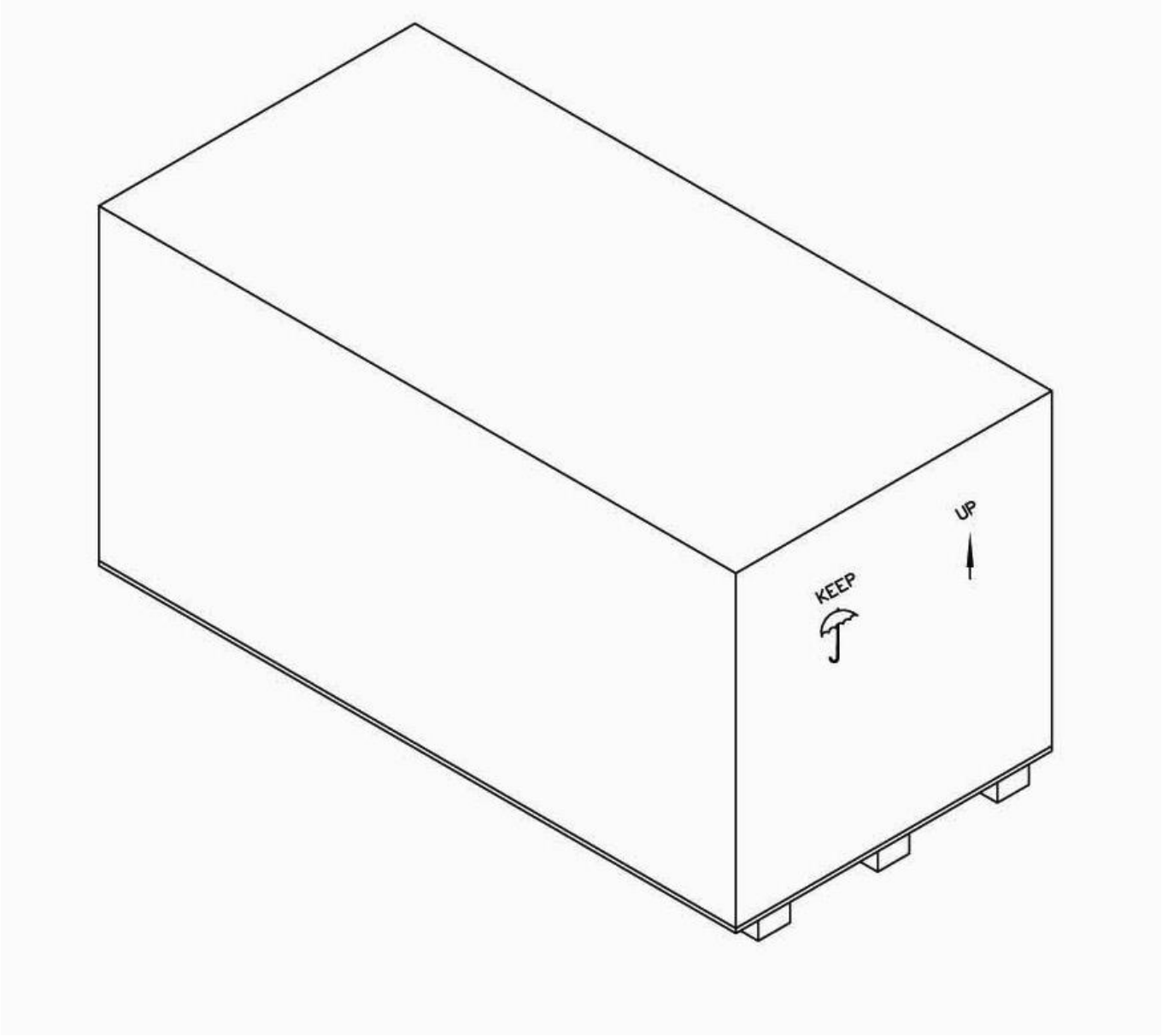
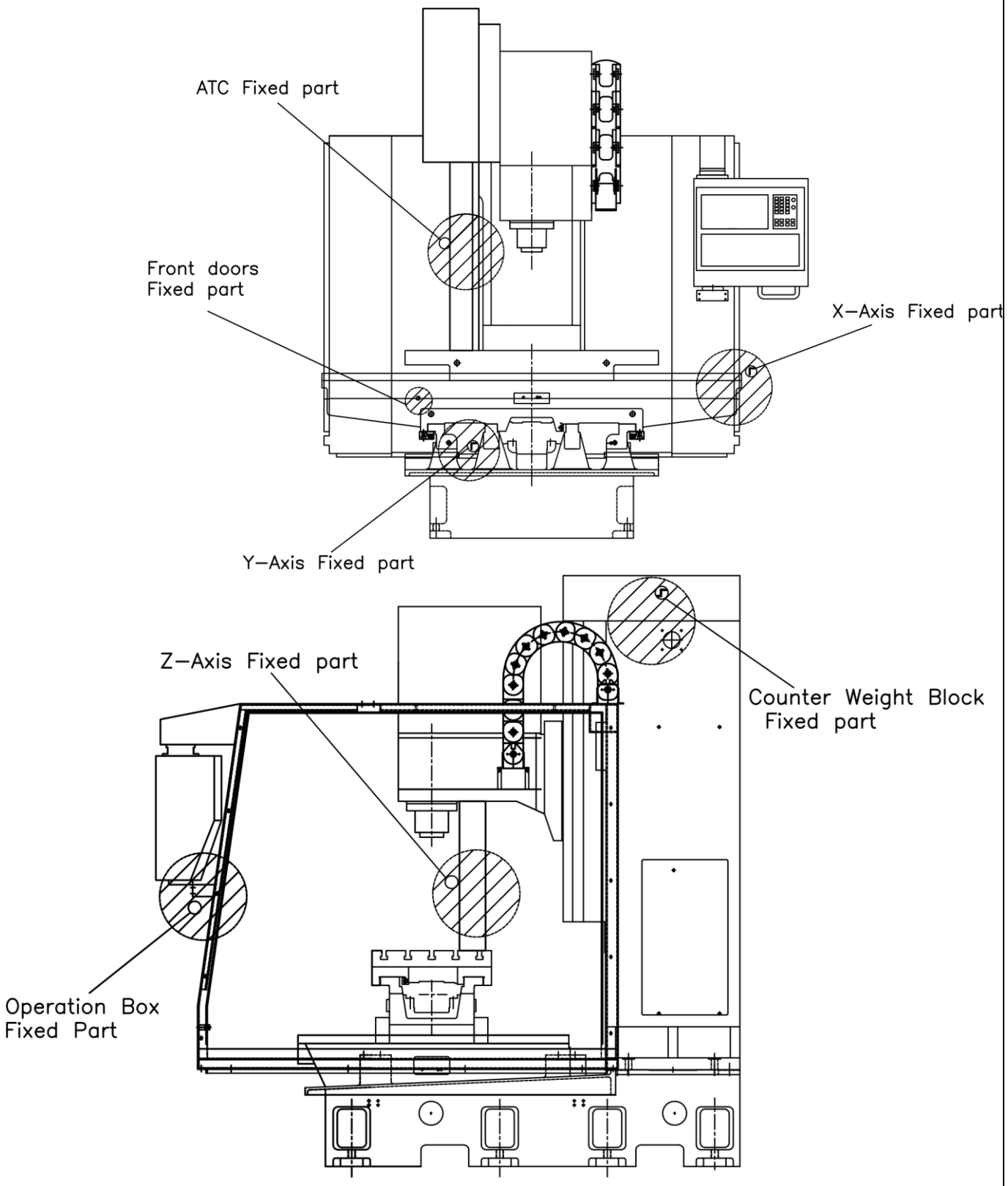


Fig. 11


ATC Fixed part
Front doors
Fixed part
X–Axis Fixed part
Y–Axis Fixed part
Z–Axis Fixed part
Counter Weight Block
Fixed part
Operation Box
Fixed Part

4. DISASSEMBLY AND POSITIONING

When the machine, which is transported in the wooden case, reaches the destination, please disassemble the top plate of wooden case and then face plates. Finally, the bolts fixed on the bottom plate will be removed. Then hang up or move the machine by lifting.

Please pay attention to the followings during transportation for preventing any danger to persons and damage to the precision of machine

(1) Please don't disassemble the case under normal conditions before the machine reaches the destination.

(2) Remove all obstacles on the transportation way for avoid harming the machine and operators.

(3) The transportation after unpacking is referred to the fixing ways , of fig. 13, 14. The bearing strength of mechanism chosen must be able to bear the weight of VMC 125, 6500Kgs.

(4) Keep the balance of machine during lifting for avoid inclination, which may damage the machine or hurt operators.

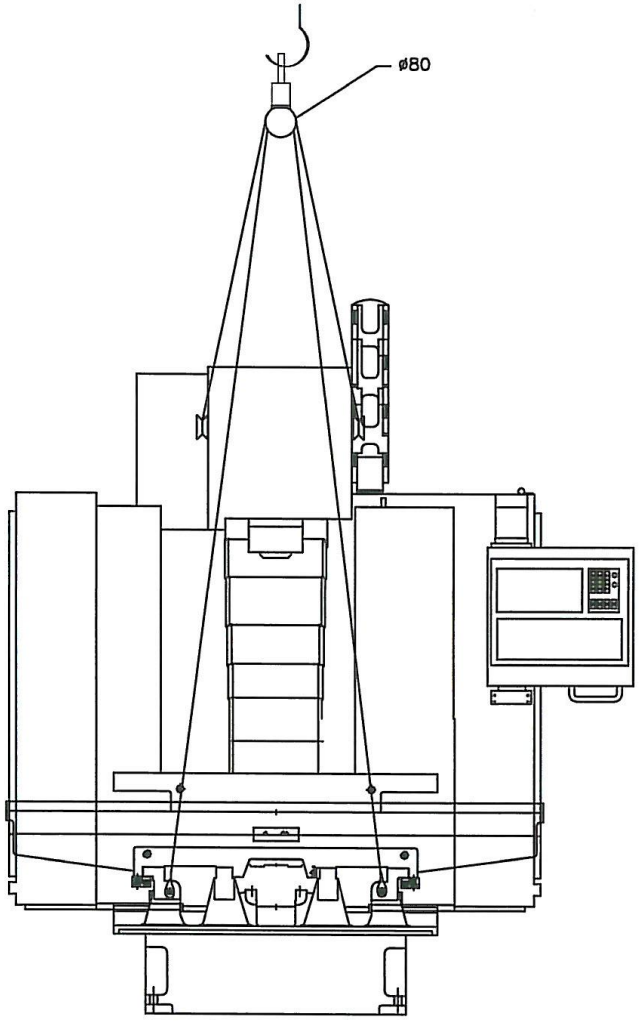
(5) The machine consists of spindle housing, column, table, saddle, base seat, electrical box, and ATC mechanism accessories. So be sure to fix all parts during transportation to avoid harming the precision, owing to up & down vibration or big vibration.

Positioning of Machine

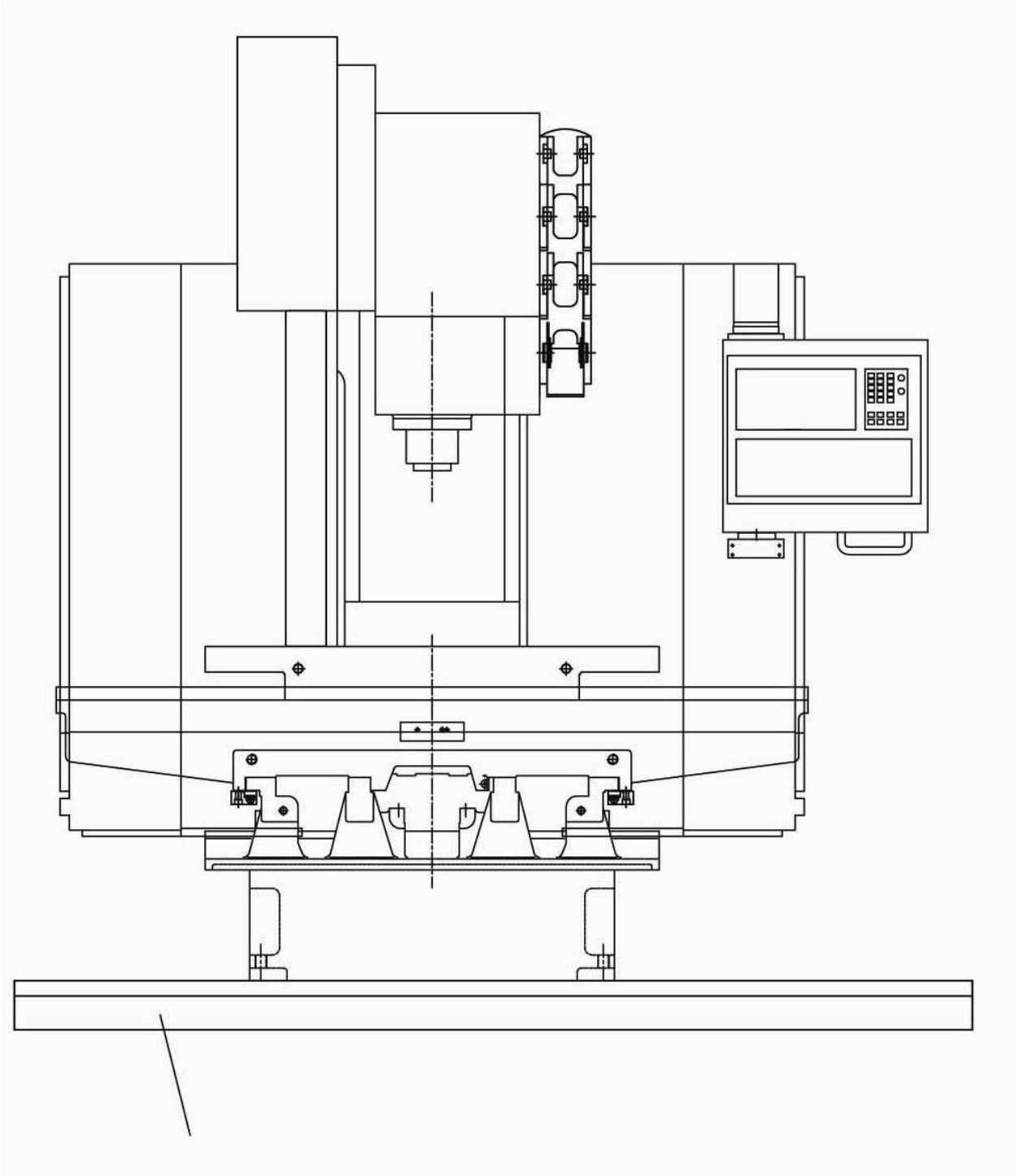
After the machine is assembled, in M.S.T. area, our domestic business service or local agents will assign technicians to install and position it.

By Crane

Overhead Crane:10ton
Wire rope:ø1"x5m
ø1"x2m



Machine Transportation



Base Plate

Fig 10

5. NOTES FOR CONFIRMATION BEFORE STARTING MACHINE

5-1 Power Requirements

Power requirements are as follows:

Supply Voltage	380 VAC
Frequency	50/60HZ
Capacity	26KVA, 27KVA
Phases	3
Supply Line Cable Size (incl. Ground wire)	22sp.mm 4cores

Note 1: The values in the table above vary depending on the optional specifications.

Note 2: For machine tools, class 3 grounding work (less than 100 Ω grounding resistance) is necessary.

Note 3: Do not connect the power cord and the grounding wire in serial; if attempted, it will give adverse affect to other equipment or cause malfunctioning of the leak breaker etc.

Compressed Air Supply

Specifications of the compressed air supply are shown below:

	Without APC
Pressure	5 to 6 Kgf/cm^2 (71 to 100psi)
Air Consumption	500 nl/min (26.4gpm)

Note 1: Air pressure at the primary side should be kept above 5 Kgf/cm^2 (71Psi).

Note 2: Compressed air should be supplied as free from moisture as possible even though the machine is provided with an air filter.

Lubricating oil

Tank	Oil Type	Amount
Spindle head Lubricating oil tank	1) Behran derafsh 46 2)Behran 68K	2 liter (0.5 gal)

Note 1: The other tanks are filled with their specified oils up to their specified levels before shipment. Lubricant preparation for these is therefore unnecessary for initial machine operation.

Note 2: Machines equipped with the optional coolant supply system require coolant that must be prepared before starting actual cutting tests.

For further information concerning the required amounts of coolant and the Recommended types of lubricating oil refer to IV. MAINTENANCE" 3-1 List of Lubrication Oil"

5-2 Leveling the Machine

Setting the machine in a level position greatly affects both working accuracy and service life. The machine should be carefully leveled during installation.

Use a precision level (0.02 mm/m per division) to measure the machine level.

Level the machine as follows:

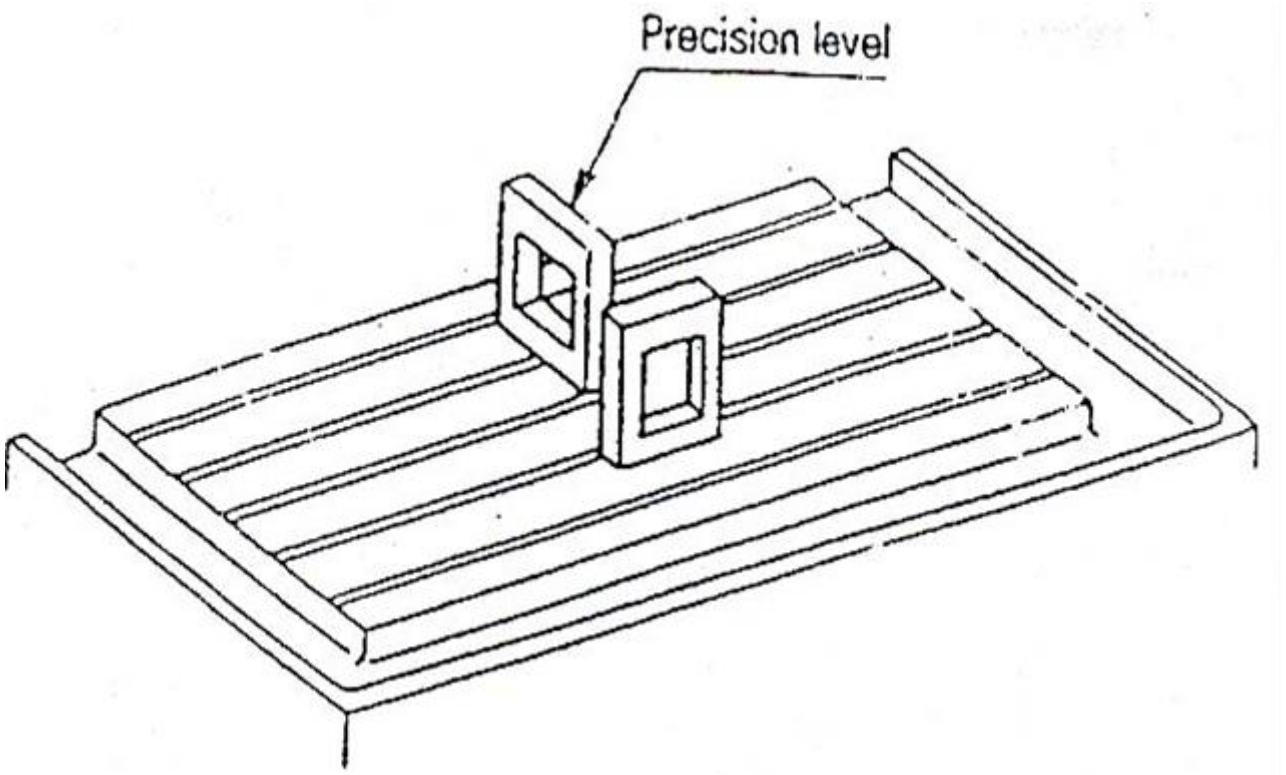
(1) Position the spindle head at the center of vertical travel (Z-axis).

(2) Position the table at the center of the saddle where the spindle center line and the table center are aligned.

(3) Position the saddle at the center of crosswise travel (Y-axis).

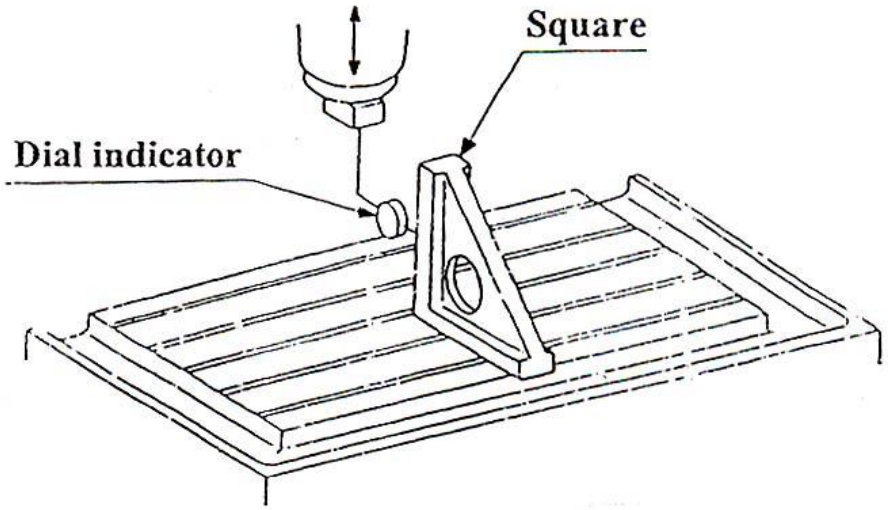
(4) With the saddle level placed near the center of the table along the X- and Y-axis directions, slowly move the table over the full range of both X and Y axis and take readings.

The machine should be leveled to within the permissible limits specified in the Static Accuracy Test Chart supplied with he machine.



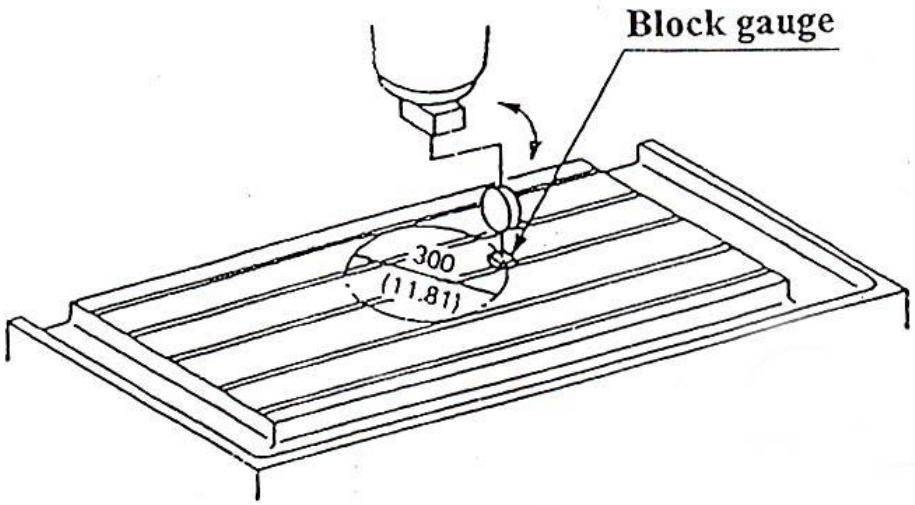
(5) Place a standard test spare on the table, attach a dial indicator to the spindle, and measure the vertical movement (Z-axis) of the spindle head with respect to the X-, Y-, and Z-axis directions.

Adjust the column inclination with the jackscrews at the front and rear of the column to the permissible limits specified in the Static Accuracy Test Chart supplied with the machine.



Also measure in Y- and Z-axis directions.

(6) Apply a dial indicator to the spindle and rotate the spindle by measure the square ness of the spindle center line to the tabletop surface.



(7) Adjust the machine level by using the jackscrews around the bed.
Adjust so that the jackscrews are not loose.
(8) After adjustments, secure the jackscrews with their respective lock
nuts tighten the foundation bolts and recheck the machine level.
The lock nuts on the jackscrews must be secured tightly even on
Machines not provided with foundation bolts.
(9) Adjust and tighten the jackscrews under the CNC unit.

Note: After the machine has been in use, check the level once a month. Should the level be off, repeat the adjustment procedure.

5-3 For raising working effect and maintaining the quality & precision of machine, please be sure to pay attention to the followings before Start the machine:

(1) Does power coerce meet the standard requirement 380 V AC?
(2) Does air pressure meet the requirement?
(3) Remove all camps fixed on the machine.
(4) Remove all rust proof protections with kerosene and clean cloth.
(5) Move away all obstacles in the machine.

Please be sure to confirm all of the above points to ensure the safety of machine and your sell:

5-4 preparing the Machine for operation

5-4-1 Lubrication

Machine parts should be lubricated according to IV MAINTENANCE "3-1 List Of Lubrication Oil".

Check oil level and operation every day.

Prior to shipment, the spindle head lubricating oil tanks and the coolant tank is drained. Fill before installation.

Note: 1. the symbols used in this chart are described in IV.

MAINTENANCE "3-1 List of Lubrication Oil" in this oil types to be used.

2. Use of improper lubricating oils may lead to poor performance or malfunction of the machine.
3. Always supply new lubricating oil when replenishing.
4. Do not supply oil without the filter.

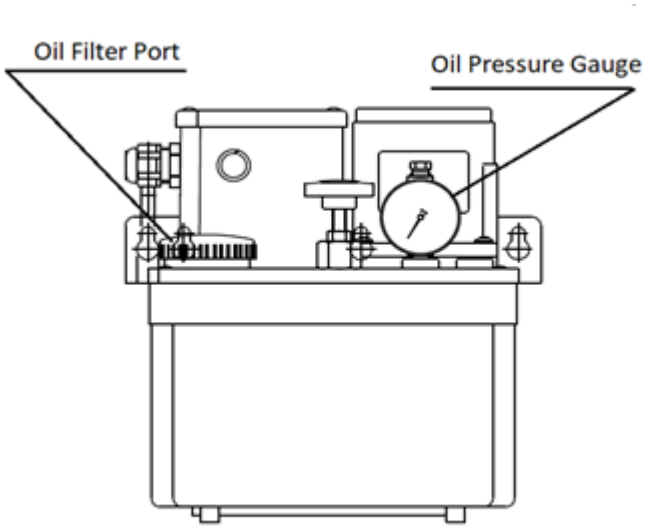
5-4-2 Centralized Lubrication Unit

The centralized lubrication unit, located at the left side of the machine, lubricates the following areas: X-, Y-,Z-axis sideways

X-, Y-, and Z-axis ball screws

The centralized lubrication unit pump operates, at. Preset intervals after power supply to the machine has been turned on. Lubricating oil is fed to the lubricating points through the metering valves installed at the gear box, the saddle and the table.

Electric Lubricating oil-feed Machine:



REMARKS

1. Always use the lubricating oil regulation specified. Using another grade of lubricating oil will damage the distributors.
2. Check guide ways and ball screws every six months for proper lubrication.

Note 1: For the alarm concerning the lubrication, refer to 5-4-5 "Lubrication Warning System (Alarm)."

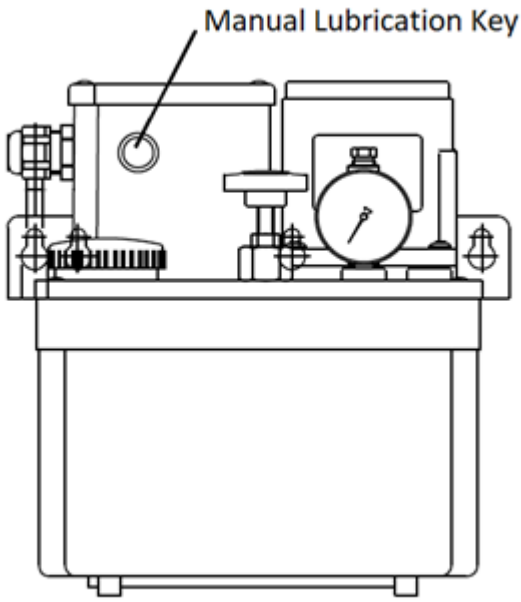
Note 2: If the guide ways have not been lubricated satisfactorily, feed the lubricating oil manually. Refer to 5-4-3 "Manual Lubrication"

Note 3: To change the time setting for the centralized lubrication system, refer to 5-4-4 "Automatic Lubrication: Time Interval Setting."

5-4-3 Manual Lubrication

Lubrication is normally automatic. However, manual mode lubrication is used before machine start-up, in cold weather after long periods of disuse or whenever automatic lubrication seems insufficient.

Press the key, fiat key on the pendant lubricator operation panel. This starts the lubrication unit pump and feeds the lubricating oil; at preset timing intervals, to each lubricating point .



5-4-4 Automatic Lubrication: Time Interval Setting

The time interval of the automatic lubrication cycle, that is, the duration of the "OFF" time, is set as a parameter in the CNC system. Before shipment, the "OFF" time is usually set to 5 minutes and the "ON" time for pump actuation is set to 6 seconds.

Note1: Recuing the lubrication frequency, that is, increasing the "OFF" time interval, to too long an interval may reduce the lubricating oil film on the guide ways and result in machine trouble.

5-4-5 Lubrication Warning System (Alarm)

Poor lubrication affects machine accuracy and causes breakdowns. As a safeguard, the centralized lubrication unit is provided with an alarm system which is activated under the following conditions:

(1) Low Oil Level in Tank

A float switch located in the tank detects a low lubricating oil level. This switch activates an alarm which is displayed on the CRT when the level in the tank drops below the lower limit.

(2) Insufficient Lubrication Pressure

A pressure switch is used to detect pump output pressure. If the pressure does not rise after the pump has been termed on, an alarm is displayed on the CRT.

(3) Excessive Lubrication Pressure

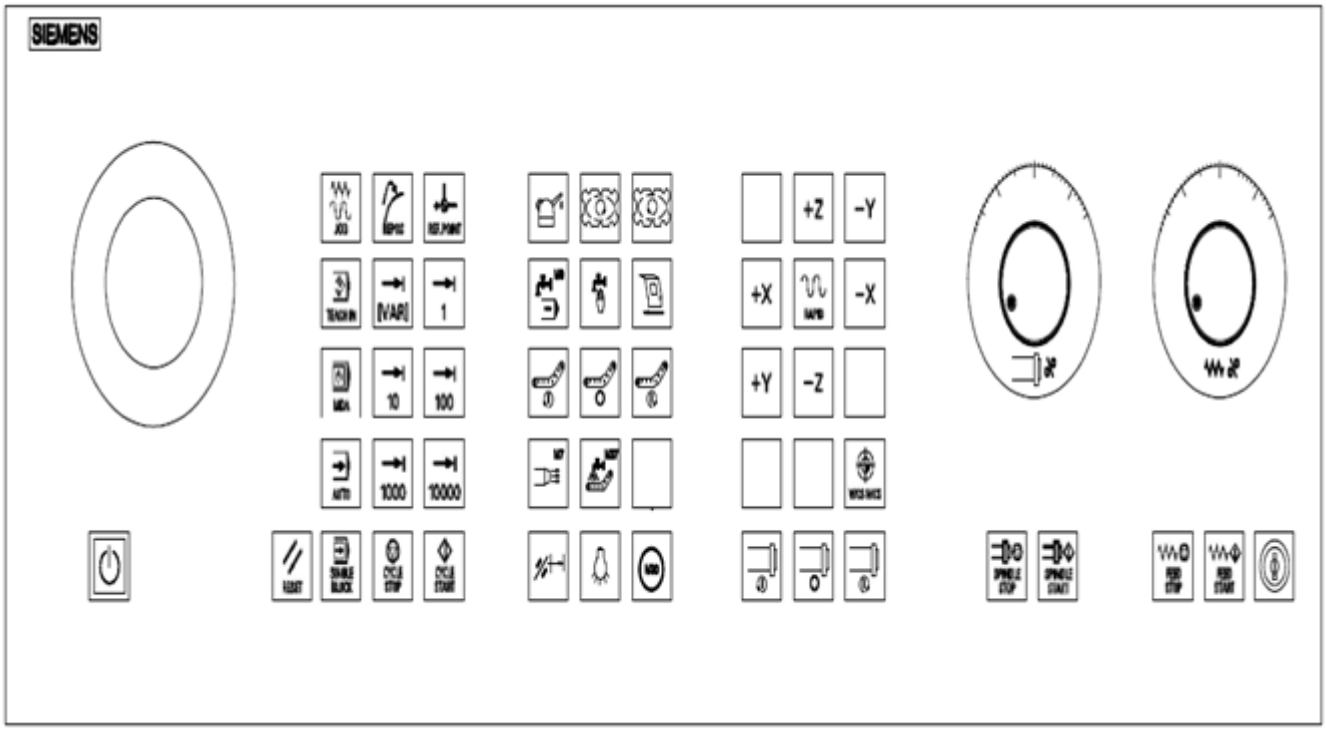
A pressure switch is used to detect pump output pressure. If pressure does not drop after the pump has been turned off, an Alarm is displayed on the CRT.

(4) Tripping of the Overload Protective Relay of the Centralized Lubrication System Pump.

Note 1: When an alarm occurs, check the description of the alarm. Take all measures necessary to reset alarm so that machine accuracy is not affected and serious trouble is prevented.

Note 2: When any of the above four alarms occurs, the alarm type is displayed on the CRT with an alarm code.

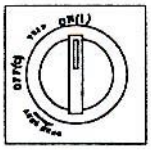
III. DESCRIPTON OF OPERATION


SIEMENS
+Z
-Y
+X
-X
+Y
-Z
1
10
100
1000
10000

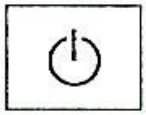
OPERATION MANUAL

1- POWER OPERATION

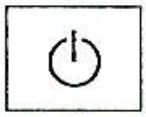
1-1 POWER ON



1. Turn "MAIN POWER SWITCH" of electric cabinet to (ON) position. (May hear coolant fan inside the cabinet start to rotate) The green lamp of ⏻ NC ON push button, on control panel, must be lit.

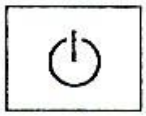


2. Depress ⏻ NC ON push button again the power of control system will start and the green lamp must be extinguished.



3. Wait for the completion of starting up. The ⏻ NC ON green lamp must be flashed.

4. Release "EMERGENCY STOP" BUTTON.



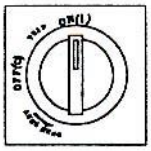
5. Depress ⏻ NC ON push button, the power of machine will be ready and the green lamp must be stop the flashing and lit.

6. The reference is not needed, it is already set in the manufacturer's factory.
(REF: 3-1) having the machine ready for operation.

1-2- POWER OFF

1. Make sure machine was in safety situation

2. Depress "EMERGENCY STOP" push button to stop Power system and all driving mechanism.



3. Turn MAIN POWER switch on cabinet to " O " ("OFF") position.

4. Or depress M30 button switch, Input M30 under MDI. The power be turn off automatically after 1 second..

2. EMERGENCY STOP

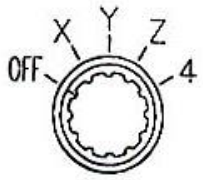
When an emergency situation was happening, depressing "EMERGENCY STOP" push button could stop all movements of machine to secure the safety of operator
and machine. When it was depressed:

1. Spindle stopped.
2. Axes movements stopped.
3. Coolant stopped.
4. Chip conveyor stopped.
5. "Emergency stop" would be shown on the display monitor.

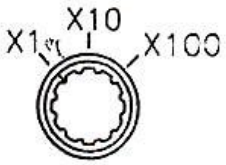
3. MANUAL OPERATION

3-1 HANDLE FEED

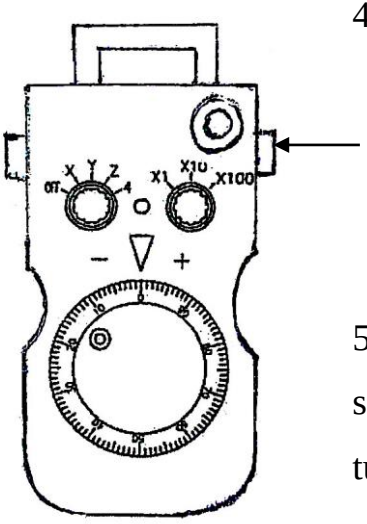
1. Depress "  " MODE selection button On MCP Panel.



2. Select the axis to be moved by using the select switch on the HANDLE wheel.



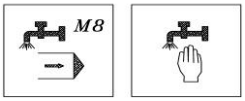
3. Select "Multiply Factor" selection switch on the handle wheel to desired position, X1 (0.001mm/scale), x10 (0.01mm /scale) or x100 (0.1mm/scale).



4- Push and hold enable button simultaneously

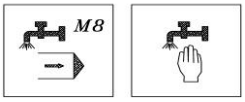
5. Table will move to the suitable position according to speed scale factor of MANUAL PULSE GENERATOR turning direction.

3-2 COOLANT



1. Depress once, coolant ON (indicator lits up).

Depress again, coolant OFF (indicator off)



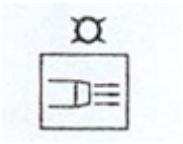
2.a) Depress "  " push button to enable M08, M09 command and indicator in it will lit up.

b) Depress again will terminate M08 command and indicator in it will OFF. In this state, the coolant is not supplied even if .M08 is executed

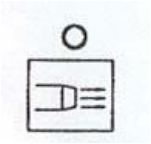
3. When the coolant is supplied through the nozzles, the .indicator lits up

NOTE: Always close the front door before turn on the coolant

3-3 AIR BLAST



1. Depress once, air blast ON (indicator lits up). (M07)



2. Depress again, air blast OFF (indicator off). (M12)

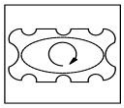
3-4 CHIP CLEAN (FLUSH CHIP):

1. Depress once, chip Clean ON (indicator lits up). (M37)

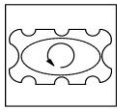
2. Depress again, chip clean OFF(indicator off),(M38)

3-5 TOOL MAGAZINE

3-5-1 MAGAZINE CW AND MAGAZINE CCW PUSH BUTTON



MAGAZINE CW: Under JOG mode; push this button will rotate the tool magazine clockwise.

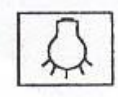


MAGAZINE CCW: Under JOG mode, push this button will rotate the tool magazine counterclockwise.

3-5-2 TOOL UNCLAMP

1. Under JOG mode, push this button will release the tool on the spindle.

3-6 WORK LIGHT



1. Depress once, work light ON (indicator lits up).

2. Depress again, work light OFF (indicator off)

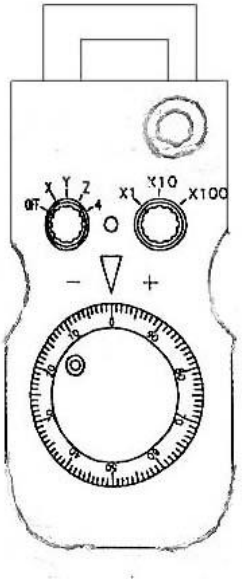
3-7 OVERTRAVEL RELEASE

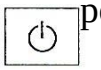
1. When the machine is in working area, the indicator in the power push button will lit up and O.T. will off.

When the machine was trying to over travel the limit switch, machine will stop and indicator in O.T. push button will flashing.

2. When over travel happening

a) Depress  push button, and hold it until moving Axes to safe area.



b). Depress  power push button. And  Reset key.

d) Using "+X,-X,+Y,-Y,+Z,-Z "in JOG mode to move Axes back to safe area.

d) Using "  "(HANDLE) to move table back to safety area. (ref:3-2)

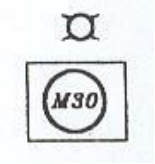
e)Release the O.T. button

3-8 AUTO DOOR (OPEN DOOR)

Controlling door opening or closing, when program, spindle or coolant stopped, door can be open. By depressing the switch, the light in the switch will lit up and door interlock would be released.

Depress the push button again, light in switch will be off and Door will be interlocked.

3-9 AUTOMATIC POWER OFF FUNCTION



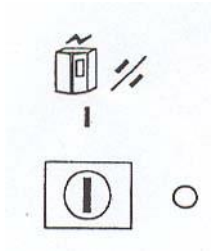
1. Depress once, the automatic power off function is effective. The power will be OFF automatically when program finished. (M30)

2. Depress again, disable the automatic

Power off function.

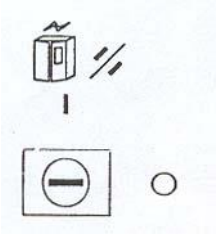
4. OTHER SWITCHES

4.1 ELECTRICAL CABINET APO



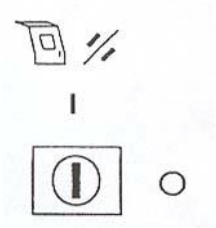
1. Electrical cabinet auto power off setting.

2. ON: When cabinet door being opened, AUTO POWER OFF will turn off power to secure safety.



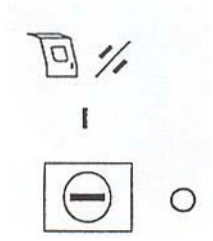
3. OFF: When cabinet door being opened, AUTO POWER OFF will still turn on power for repairing machine. It should not be used in normal condition.

4-2 DOOR INTERLOCK



1. Door interlock setting key.

2. ON: Door interlocks effective. (ref: DOOR INTERLOCK FUNCTIONS)



3. OFF: Door interlock un effective. Door can be opened. Axial movement and spindle rotating will be limited. Program can be executed under Single block mode.

5. DOOR INTERLOCK FUNCTIONS

Door of full enclosure has equipped with magnetically type interlock to secure operator's safety. Please read the following related descriptions carefully to ensure the safety of operations.

(1)CONDITIONS OF TO OPEN AN INTERLOCKED DOOR:

(1) Spindle stopped.

(2) Coolant stopped.

(3) Program stopped.

(2) METHODS OF OPENNING AN INTERLOCKED DOOR:

(1) Depress "Door open" push button.

(2) When machine is reading a command of M00/M01/M02/M30, of a CNC program

(3) RESTRICTIONS OF OPERATION WHEN INTERLOCK DOOR WAS OPENNED:

(1) Spindle speed is limited below 50 rpm.(PAR.35160)

(2) Axial movement feed rate is limited 80%

IV. MAINTENANCE

1. Torque Chart (BT-40)

For 8000 rpm

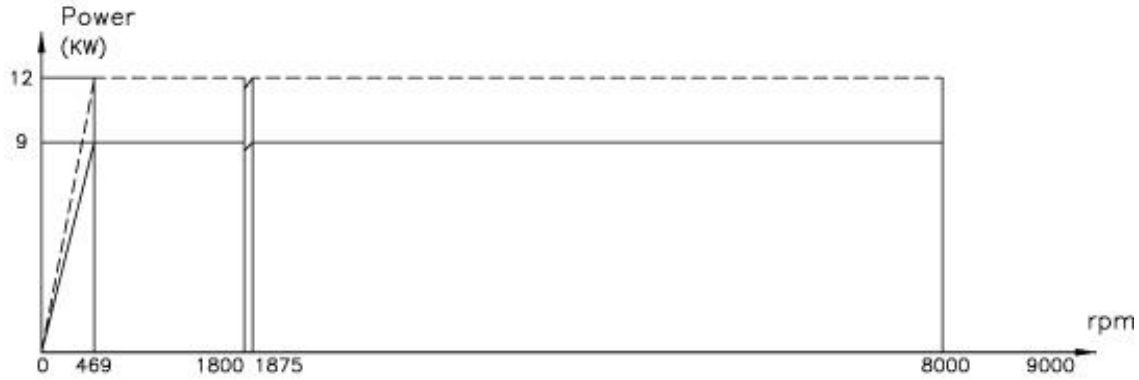
SIEMENS AC Spindle Motor 1 pH8107

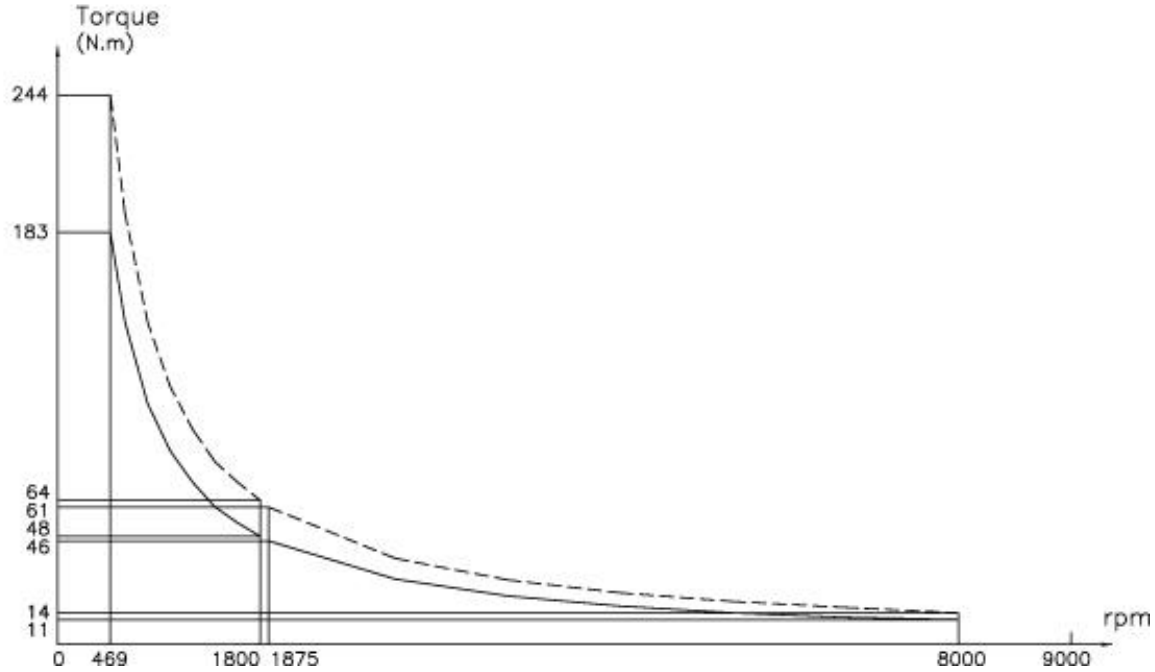
Base speed 1500 rpm

Max speed 8000rpm

ZF Gearbox ,i=1:4

SPEED		S1=0.3125		S2=1.25	
MOTOR		1500	5760	1500	6400
SPINDLE		469	1800	1875	8000
TURQUE	(9 KW/30min)	244	64	61	14
	(12 KW/30min)	183	48	46	11





2. PREVENT I0N & MAINTENNANCE

2-1 Daily Maintenance

(1) Check the oil level of every lubricating oil tank. When oil amount is below the standard, fill it anytime.

(2) Check every lubricating parts and make sure the lubricating situation of oil-is good.

(3) Check pneumatic gauge maintain the pressure at 6 kg/cm^2. the desired pressure.

(4) Air pressure leakage must be repaired immediately.

(5) Check the oil amount of the service unit; add if it's below standard. Also get rid of water and vapor.

(6) When machine is started, check if coolant is sufficient and cooling mechanism can work.

(7) Clear the obstructions on the machine to avoid damaging machine.

(8) After work is finished everyday, please keep the machine clean anytime and apply grease to the exposed slide surface to avoid rusting.

(9) The spindle taper must be kept tidy all the time. After operation, clean the taper with spindle taper cleaner and apply proper lubrication.

(10) Pay attention to machine's running anytime. If there is any situation occurring, please stop machine and check it.

2-2 Weekly Maintenance

(1) Wipe reflector of reading device with clean absorbent cotton or soft gauze to keep it clean and shiny.

(2) Use detergent and water to clean the air filter of the service unit to maintain the purity and smoothness of air supply.

(3) Make sure that the spindle tool clamping and unclamping movement is smooth.

(4) Check if the circulating oiling and centralized oiling of pump is normal.

(5) Make sure that the ATC's tool changing action is sound and smooth.

2-3- Every Half-A-Year Maintenance:

(1) Check If range of deflecting oscillation of spindle Is too large and if gap of spindle's bearing is normal.

(2) Check if screw or nut is loose.

(3) Check if gap of taper gib of every slide rail is too large.

(4) Fully check if outer layer of every wiring (connecting point: adapter, socket, switch) is good and clear accumulated dust.

(5) Fully check insulation resistance and record it.

2-4 Yearly Maintenance:

(1) Check if every controlling switch on operation panel is sensitive and normal.

(2) Clear accumulated carbon on all connecting points of relay in electric box and wipes them cleanly.

(3) Make sure that the counter weight chain is in normal condition.

(4) Wash coolant tank and replace equivalent coolant.

(5) Wash centralized lubricating oil tank and replace equivalent new oil.

(6) Wash forced lubrication oil tank and replace equivalent new oil.

(7) Correct machine's level every year and maintain machine's accuracy.

2-5 Maintenance Notes:

(1) Exactly perform maintenance of every glade.

(2) When parts are replaced or adjusted, please stop machine's running to avoid danger occurring.

(3) When circuit board in the numerical controlling box is removed for Inspection and repair, don't input electric power, otherwise AC servo motor will lose control and run at high speed that easily results in danger.

(4) If the maintenance or repair is out, of your ability, please contact the manufacturer to avoid damaging machine's accuracy.

(5) For all self-done maintenance actions, please first make sure if electricity break should be done for safety.

3. LUBRICATION OF MACHINE

Lubrication of Machine

Performance, reliability and durability of machine depends on

Perfect lubricating system and lubricating management. To secure tribology state of relative motion face, proper inspection, oil feed or replacement with oil at suitable time and place is necessary. The lubricating way of spindle's bearing, gear and slide rail is explained as follows:

Lubrication of Spindle Bearings:

The spindle bearings of this machine adopt grease lubrication with long life, so it doesn't need to add extra lubricant.

Gear Lubrication:

Gear in the gear box is lubricated by pump to reduce friction and take away the produced heat to reduce heat power.

Lubrication of S1ide Surface:

It adopts the centralized lubrication, so the lubricating oil must have the features of wear resistance, pressure resistance and good adhesive property to reduce wear and vibration. The parts to be centralized lubricated include table, saddle, slide surface of spindle housing, X-Y-Z axis ball screws.

Manual Lubrication:

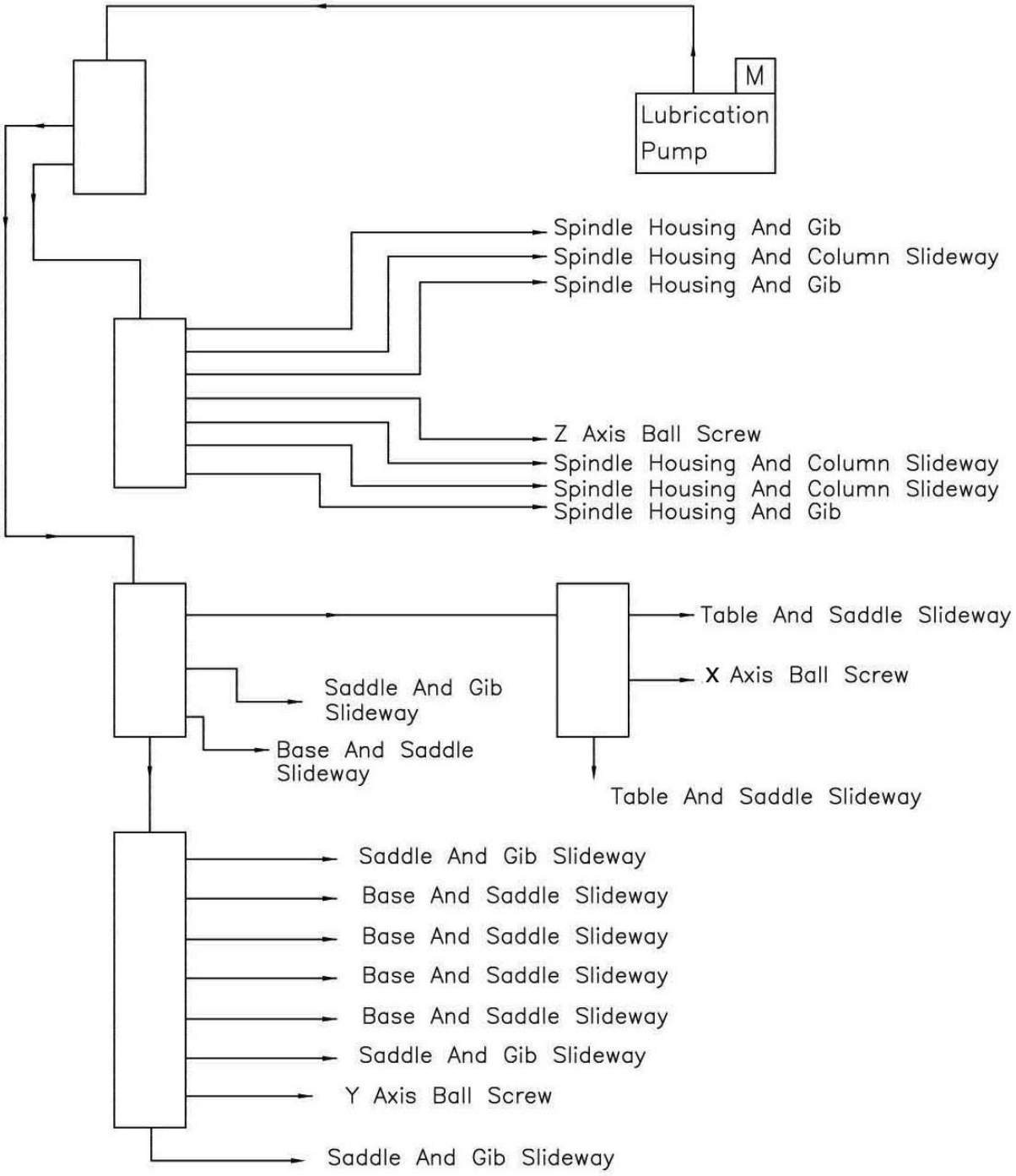
It's for the places which are not easily lubricated or don't need

to be often lubricated. The. Parts to be lubricated include counter weight block chain, sprocket wheel which uses grease lubrication, and movable door and its roller, MAG linear motor roller bearing which uses lubricating oil.

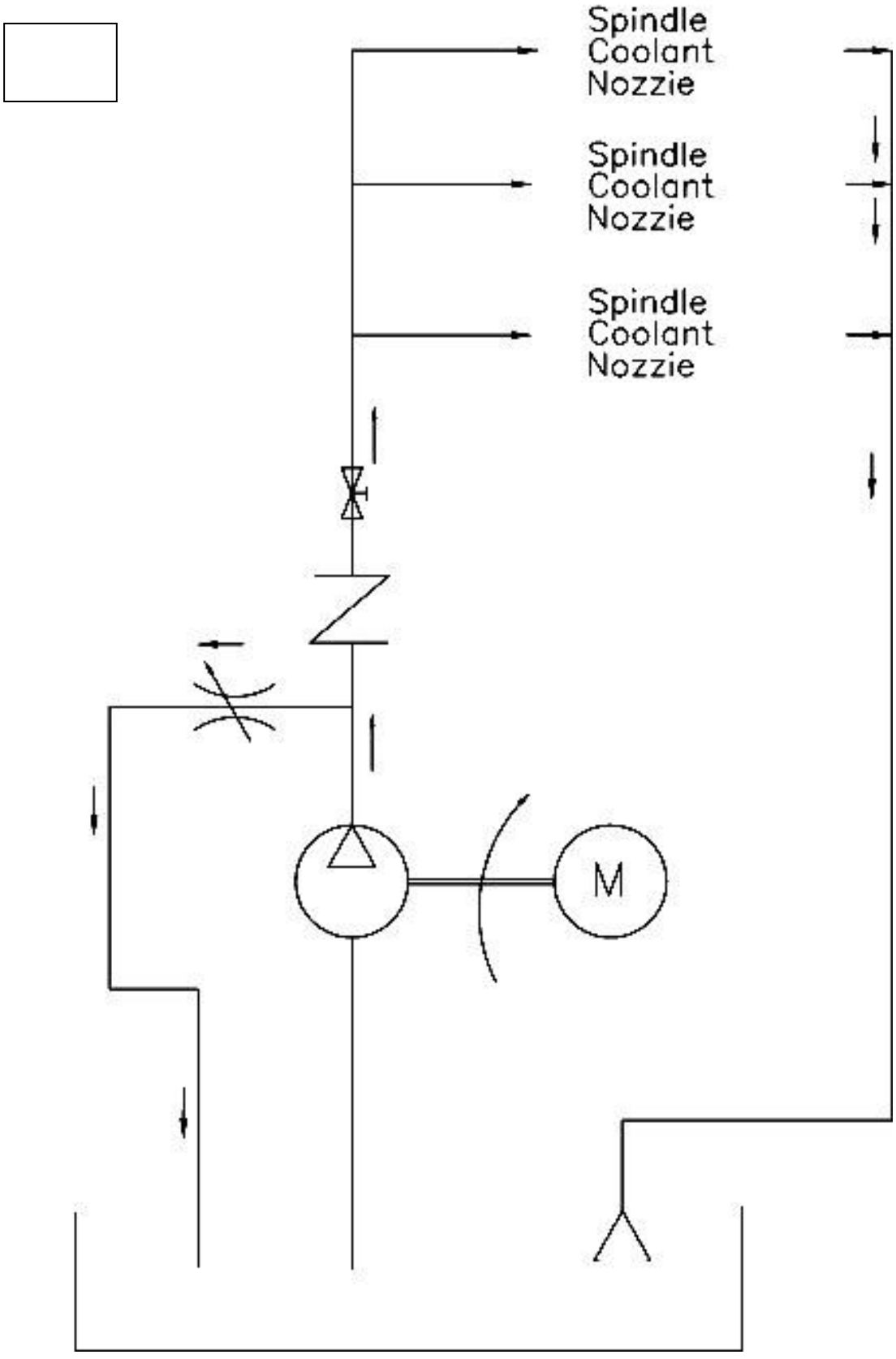
3.1 List of Lubricating oil

Oiling position						
ITEM	1	2	3	4	5	6
LUBRICATING POSITION	1) Gear BOX	1) Table. Saddle. Head Stock Slide Surface 2) X,y,z Axis Ball screws	Cutting Tool Coolant	Air Conditioning Unit	Chain	Booster Cylinder
VOLUME	2L	2L	150L	0.3L	Proper amount	Proper amount
LUBRICATING WAY	By pump	Centralized lubrication	Circulating oiling	Air atomizing oiling	Manual grease lubrication	Manual oiling
OIL REPLACING PERIOD	Every 1000 Hours	Usually keep Over oil level	Yearly replacement	Usually keep over oil level	Every half a year maintenance	Yearly replacement
OIL'S FEATURE	1) Viscosity: ISOVG46	1) Viscosity: ISOVG68	1) Large heat transfer	1) Viscosity: ISOVG32	Grease	1) Viscosity: ISOVG32.
	2) Viscosity index	2) Viscosity index	2) Good lubricating property	2) Viscosity index is over 95		2) Viscosity index is over 95
	3) Wear resistance and pressure resistance 3) Rust proof. Anti-bubble Anti-oxidation	3) Wear resistance And pressure Resistance 3) Rust proof Anti -bubble Anti-oxidation		3) Rust proof . Anti-bubble Anti-oxidation		3) Rust proof. Anti-bubble Anti-oxidation Anti-emulsification
OIL RECOMMENDED	1) Ip Pontiax Hds IP Hydrus X46 (Behran derafsh 46)	1) Mobil Volocite Oil .2. Behran oil 68k	1)Esso pennex 47.	1) Mobil DTE oil 26. Behran oil 32	1) Esso Beacon	1) Mobil DTE oil 26 Behran oil 32
		2) Esso Febise K68-	2) Shell Dromus B.	2) Shell Tellus 32.	2) Shell Alvania R-2.	2) Esso Nuto H32
		3) Shell Tonna T68. 4) chevron way Lubricant 68		3) Esso Nuto H32		3) Shell Tellus 32.
OONTAINER'S POSITION	At Spindle Housg Right-Side	Under the column Left-Side	At the Cutting Water tank	At the column Left-Side		

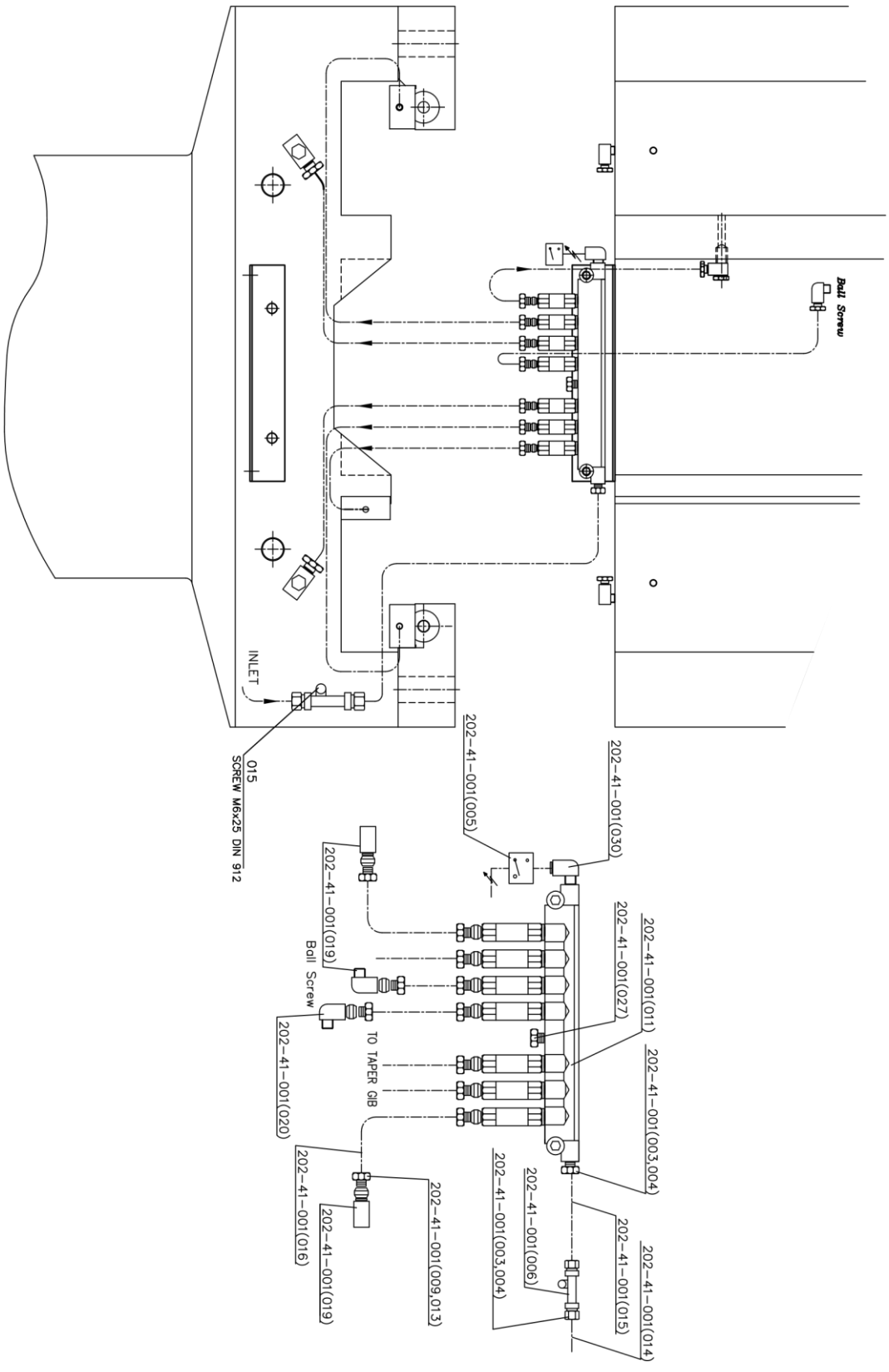
3-2 Centralized Lubrication Loop



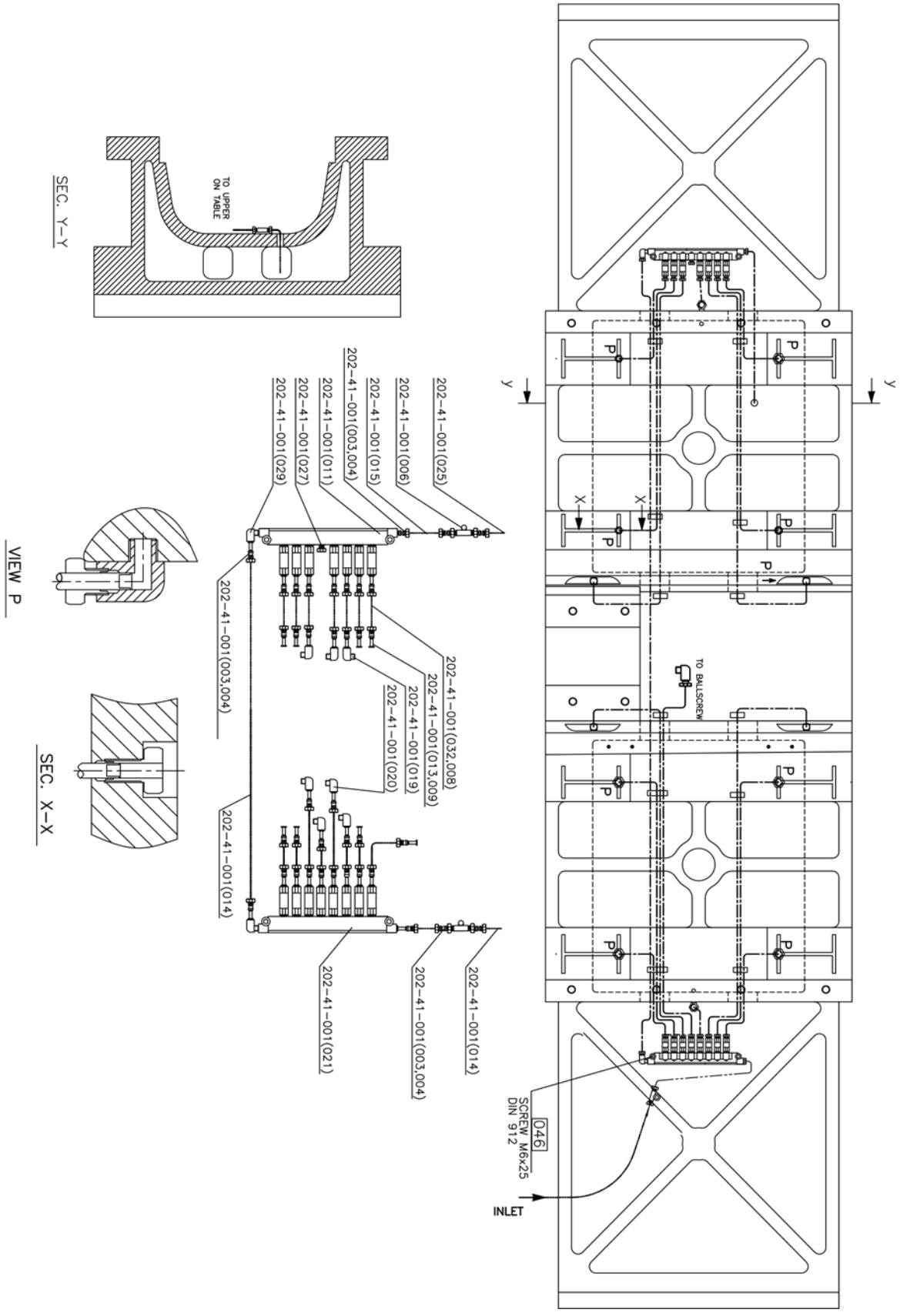
3-3 Coolant


Spindle
Coolant
Nozzie
Spindle
Coolant
Nozzie
Spindle
Coolant
Nozzie
M

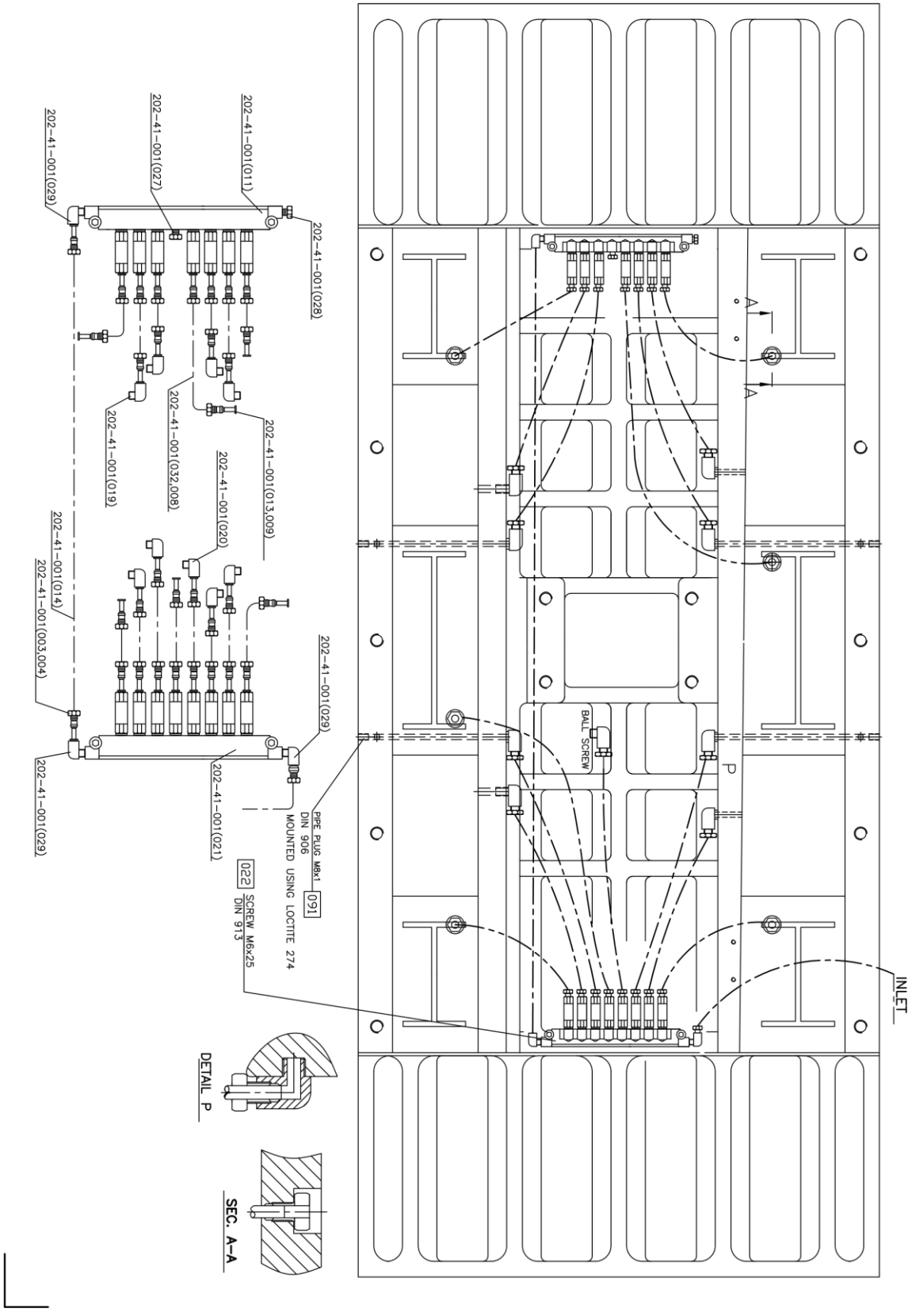
3-4 Spindle Housing And Column Slide way Lubrication



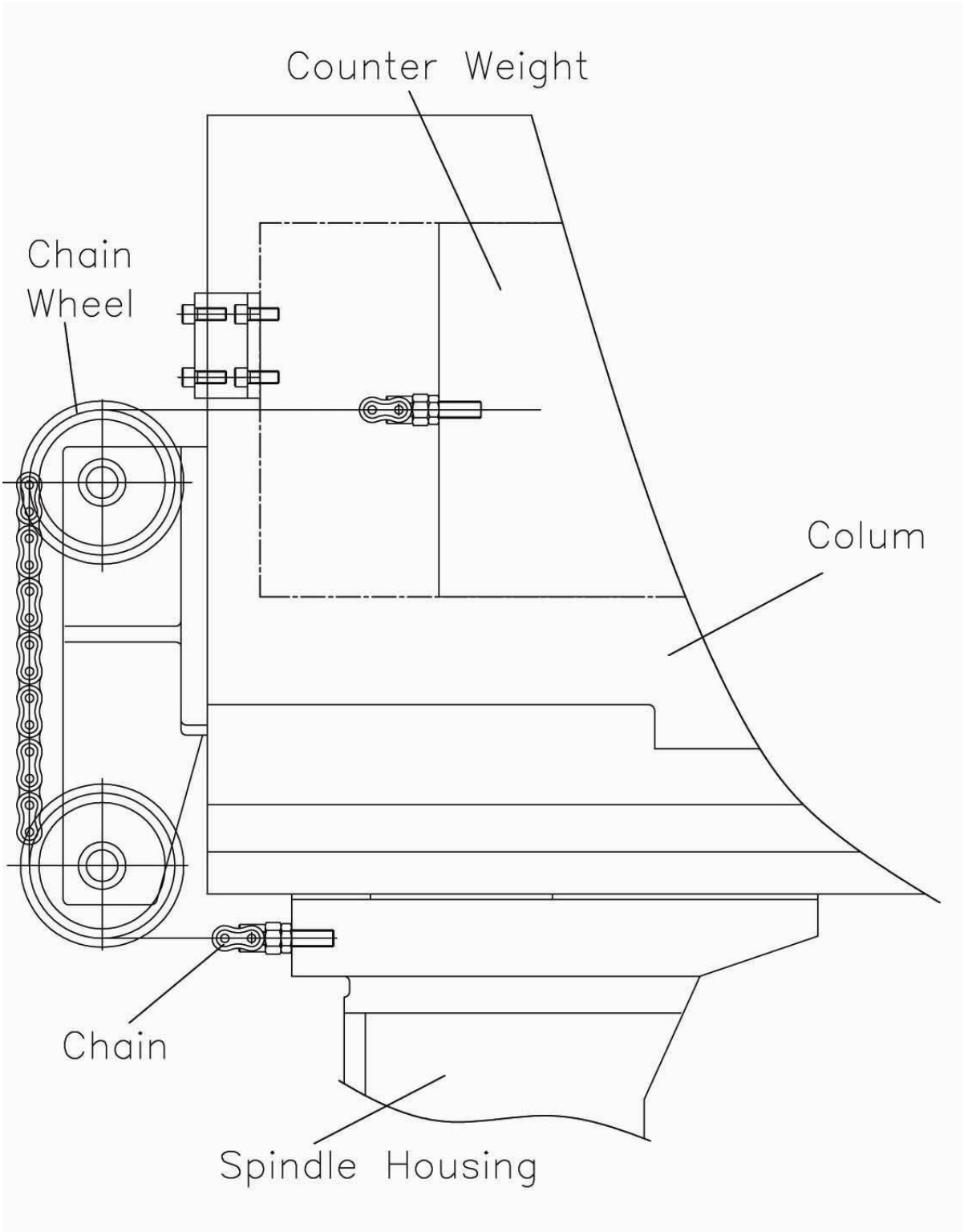
3-5-1 Saddle And Base Slide way Lubrication



3-5-2 Table Slide way Lubrication

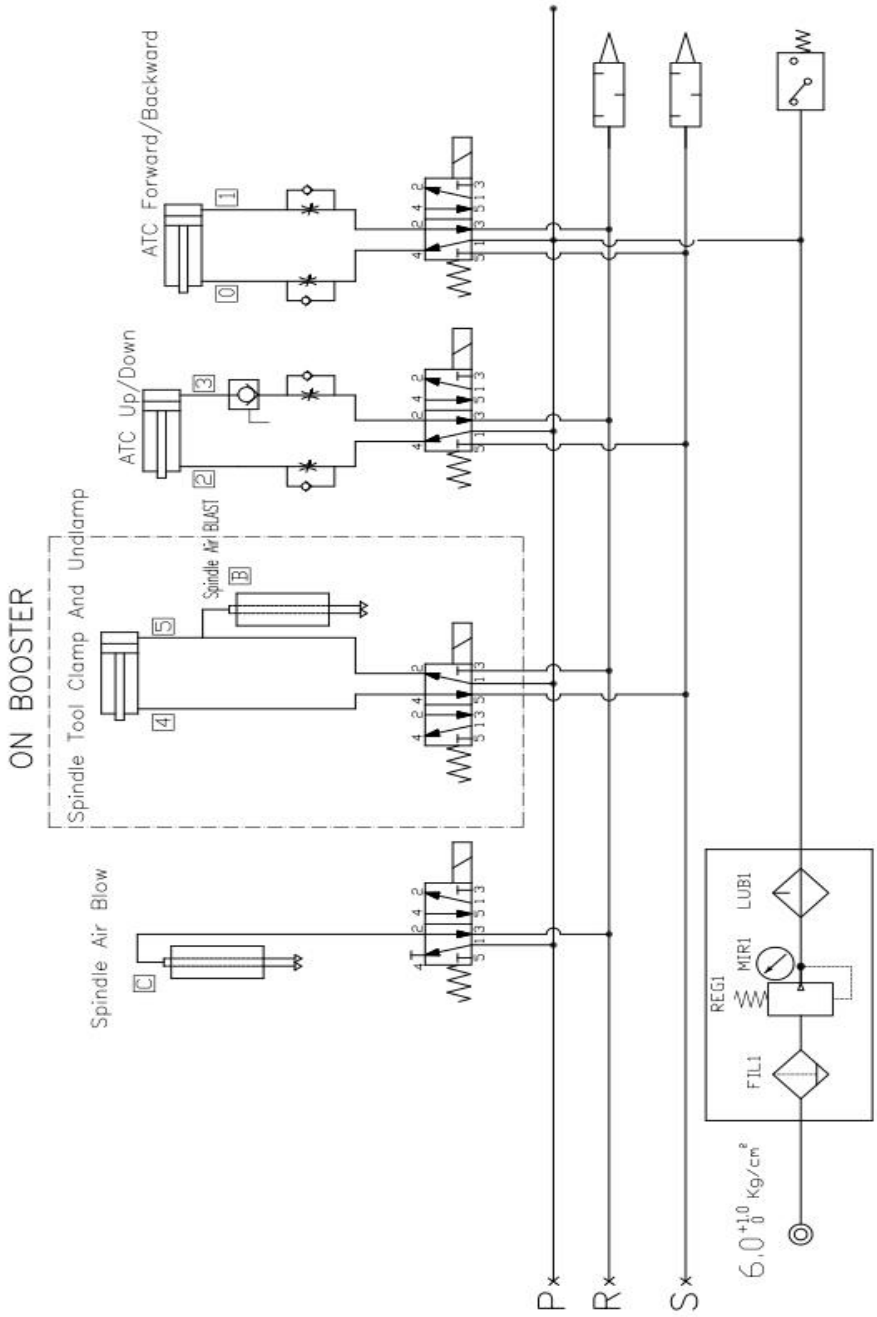


3-6 Manual Lubrication



4 Pneumatic System

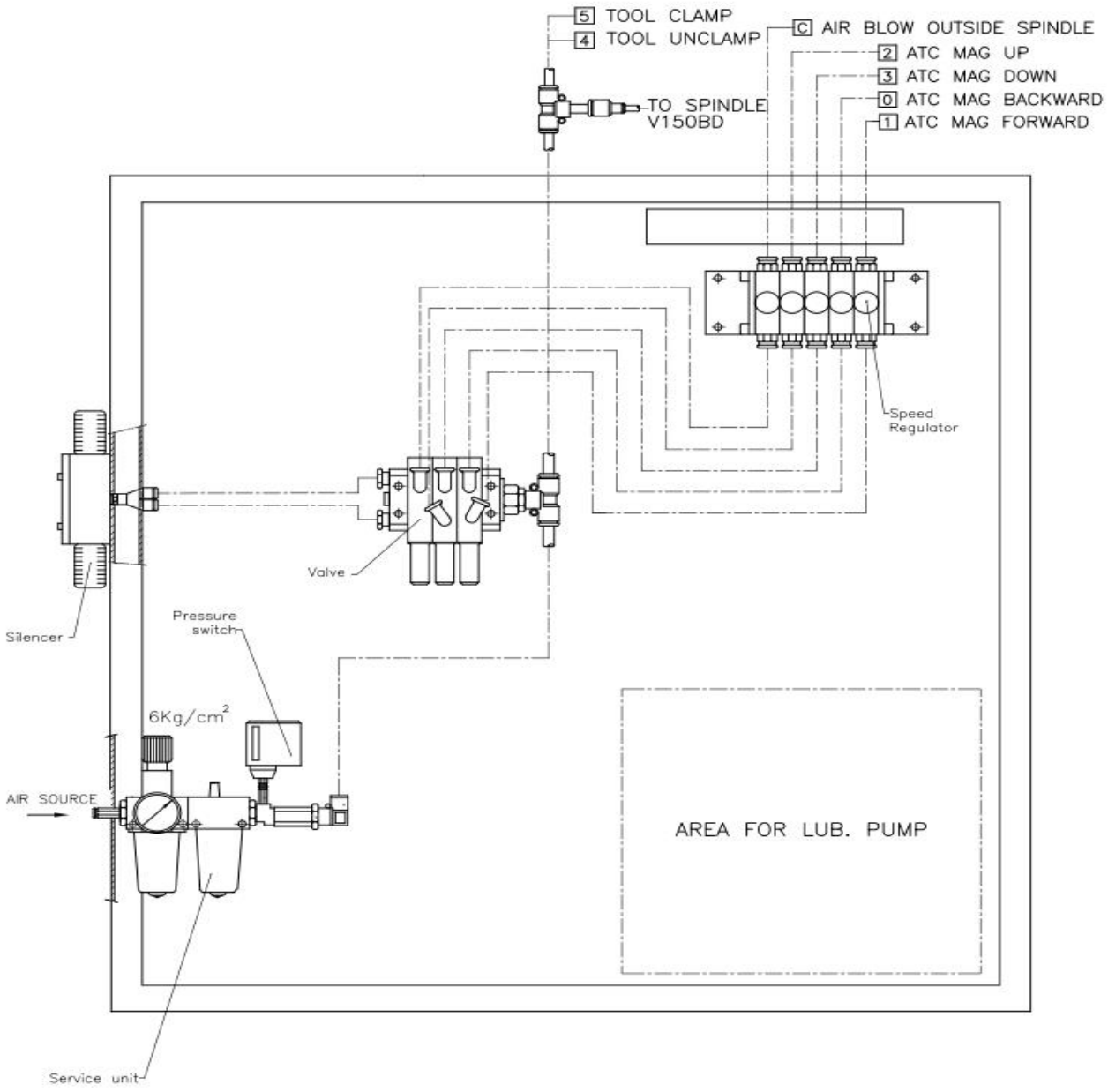
4-1 Pneumatic Loop



Pneumatic System List

No.	TAPE	NAME	AMOUND	REMARKS
04	MVSD-260-4E1/110V	Electromagnetic Valve	4	
03	SL-02	Noise Silencer	2	
02	KP.1 060-1101	Pressure Switch	1	
01	FRC-1/2-S-B	Air Conditioning Unit	1	

4-1-1 Pneumatic and Centralized Lubrication System



4-2 Maintenance & Adjustment

The pneumatic system includes the service unit, solenoid, throttle value, silencer, and cylinder, etc. The performance of these Parts is dependent on-the maintenance and adjustment.

Service Unit: (fig.1)

1. Air filter: Remove the remaining dust and water in the
air so as to prolong the life of the pneumatic system. When the air pressure and exit's pressure exceeds 1 BAR, it is necessary to clean filter or it has to be cleaned periodically. Methods for cleaning are:
(1) Remove filter, blow it with compressed air.
(2) Replace it with a new one.

2. Pressure Reduction Valve: The main function is to reduce the pressure of the compressed air to the most proper degree for the pneumatic system. Generally speaking, pressure of the processed air should be 5 kg/cm or 6 kg/cm or even smaller. Turn the pressure adjusting hand wheel clockwise to increase pressure, counter clockwise to reduce pressure.

3. Oil Mist Lubricator: When air inters the oil mist lubricator, it will also bring some oil. This little amount of oil will then lubricate all sliding parts so as to prolong their lives. The lubrication will reach air cylinder, solenoid, pneumatic tool clamping, spindle positioning, and ATC.

Don't put too much oil in the oil cup. Too much oil will cause very little air flow, which will slow down the air flow speed of the jet, thus vacuum can not be created. As a result, lubricant oil can't be pumped out from the oil cup.

Supply oil according to the instruction on the oil cup.

Use correct lubricant oil-iso VG-32 first class turbine oil or oil of the same nature.

4. Notice:

(1) Pay attention to the pressure limit, never exceed the highest limit. The temperature should be between 5 - 60 C. Avoid Direct sunlight on the unit.

(2) The containers of the service unit are made of plastics and
should never be exposed to solvent or be cleaned with solvent.

(3) Assemble the unit vertically and avoid tilting.
Pay attention to the air flow direction.

(4) Wash the container with mild detergent. Never use gasoline or alcohol.

Solenoid: (f ig.2)

The directional control valve provides the basic loop control.
It can control the open/close of the flow loop or the flow direction, or control the starting, stop, movement direction of the activator. Breakdown and Maintenance:

Dust: Dust is the main factor causing breakdown. The sealing tape chips and dust often enter the solenoid or cylinder and cause abnormal operation. Therefore, it is necessary to blow off all the above mentioned substance completely during pipe arrangement.

Sticky: Mainly due to the deterioration of air compressor's lubricant oil. To solve this problem, it Is recommended to enhance the lubricant management and periodically check the operation of the rear cooler and the filter.

Winding Burn Down: Caused by the burn down of the winding or broken wires.

Inadequate Installation and Adjustment: Because electricity is sent to the dual winding simultaneously, different voltages or inadequate piping will cause problems. Please pay special attention to the maintenance and re-installation.

Inadequate Lubricant Oil: Caused by the usage of high viscosity lubricant oil such as motor oil. Only ISO VG32 class oil, such JIS No. 1 turbine oil should be used.

Throtti1e Va1ve : (fig. 3)

The throttle valve controls the inflow of pneumatic unit.

It also controls the speed of cylinder and other parts. The speeds of spindle positioning and ATC movement (up-down, back forth) are all controlled by the throttle valve.

Adjustment of throttle valve speed: Release lock nut, then turn the handle rod clockwise to increase the speed, counter clockwise to decrease the speed, After adjusting the speed, be sure the fasten the lock nut.

Notice for throttle valve operation:

(1) Throttle valve untidy: Clean the throttle valve.

(2) Internal bushing damaged: Replace the bushing.

(3) Internal spring broken: Replace the spring.

(4) Air leaking from the throttle valve: Replace the internal o-ring.

Silencer : (fig. 4)

Silencer is assembled at the gas port to reduce the noise caused by the out-flow air.

Pneumatic Parts

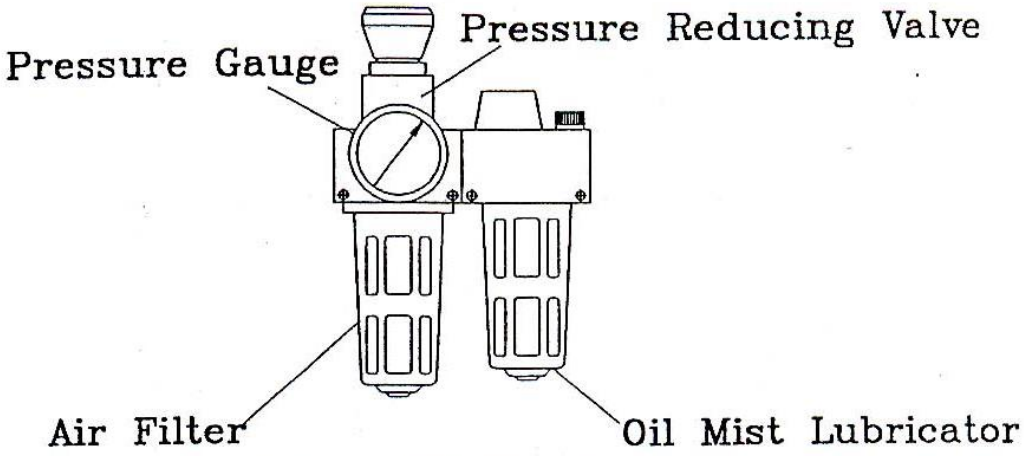


Fig.1 Service Unit

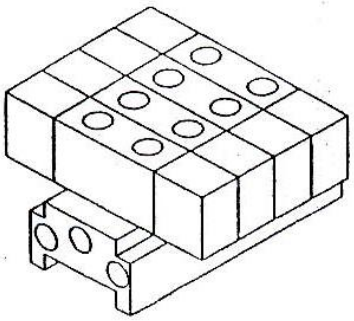


Fig.2 Solenoid

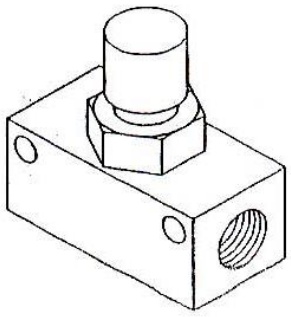


Fig.3 Throttle Valve

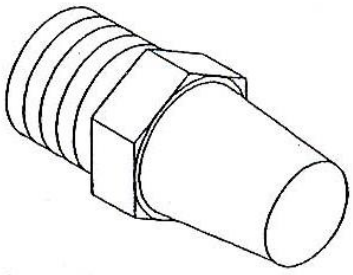


Fig.4 Silencer

5. MECHANICAL MECHANISM

5-l. SPINDLE MECHANISM:

(1) Spindle Transmission: (See P4-22)

Spindle transmission consists of spindle motor, gear box, pulley, belt and gear. The low rotating speed of BT40 spindle is 60-8000rpm and the high rotating speed is 60-10000rpm.

(2) Tool Clamping/Unclamping: (See P4-22)

Tool unclamping: The cylinder at the rear end of spindle activates the reach rod to open jaw to unclamp tool and make it remove from spindle nose and then the air blow device blows air to clean cutter sleeve, pull stud and tool holder.

Tool clamping: The disc spring pulls the reach rod forwards by the elastic force to activate jaw to clamp the tool holder and make the tool be fixed on the spindle nose. The clamp force of BT40 is about 1000kg.

(3) Buffer Device And Adjusting Method Of The Clamp Tool Force: (See P4- 22)

When tool unclamps and the spindle impacts cylinder and strikes the reach rod, there is one counter-striking force occurring. Therefore, the fixing seat and the cylinder are connected with the straight pin to leave clearance to absorb counter-elastic force while striking.

After disc spring has worked for a long period of time, it can occur fatigue and its clamp tool force can become less. To adjust the elastic force reaching the desired requirement, the force of disc spring must be adjusted to reach the requirement. For adjustment, first loosen the first nut and then turn the second nut downwards. The holding down block will press downwards to make the elastic force enlarge. When it's adjusted to the suitable pressure, tighten the second nut.

5-2. SPINDLE POSITIONING MECHANISM:

Spindle Positioning By Magnetic Sensor: (See P4-23)

The mechanism can control the stop of spindle rotation and matching of change tool position. During positioning, when spindle rotates at high speed and then stops, it will rescue the rotating speed to the slow speed. When the sensor senses the signal of magnetic sensor, the spindle controller controls the spindle motor. The positioning is completed.

5-3 ATC MAGAZINE: (VMC-125, See P4-21)

ATC magazine mechanism applies Drum type armless design. The tool magazine can store 20pcs or 24 pcs of tools. Because it is a simple structure with perfect design, it's easy for operation while running and the maintenance is simple.

The process of tool magazine rotation is as follows**:**

600WAC motor - 1/25 speed reducer - rotation - CAM disc activates tool magazine - reach the desired position of tool.

When controller receives command of change tool, horizontal cylinder will move forwards to the position of empty tool sleeve to receive the tool on the spindle and then the striking cylinder can strike the tool unclamping device to unclamp tool. Furthermore, the vertical cylinder will remove tool from spindle and the speed reducer rotates to activate tool magazine to the desired position of tool. The vertical cylinder goes upwards to carry tool to the tool clamping position. The horizontal cylinder returns to the original position. The tool change action is completed.

To surely perform tool change work, two limit switches installed on the vertical cylinder and one each limit switch and photo electric switch installed on tool position can complete inspection, and positioning actions to secure safe work.

5-4 FEEDING TRANSMISSION MECHANISM:

5-4-1 X,Y,Z Axis Directly Counter Drive: (See P4 - 28)

Way of X, Y, Z axis transmission: AC servo motor directly drive ball screws through coupler to activate work table and saddle to make them do front/back & left/right reciprocation motion on saddle's slide way and base's slide way...

Because AC servo motor and ball screws adopts direct connection transmission, machinery features little maintenance and low noise.

5-4-2 X,Y,Z Axis Positioning Mechanism: (Seep4-25,p4-26,p4-27,p4-28)

The machine is equipped with over travel detecting mechanism which can prevent over travel by the limit switch and the positioning block. Based on the central line of work area and work table surface, the limit switch is fixed on saddle, the fixing seat is fixed on the table and the two ends of the fixing seat are installed with the positioning blocks. When the table reaches the max., travel, the positioning block will touch the limit switch and then the limit switch will signals controller to stop machine running to secure safety of machine.

5-5 LIMIT SWITCH:

5-6-1 Gear Box Limit Switch:

5-6-2 Spindle Positioning Limit Switch: (See P4-23)

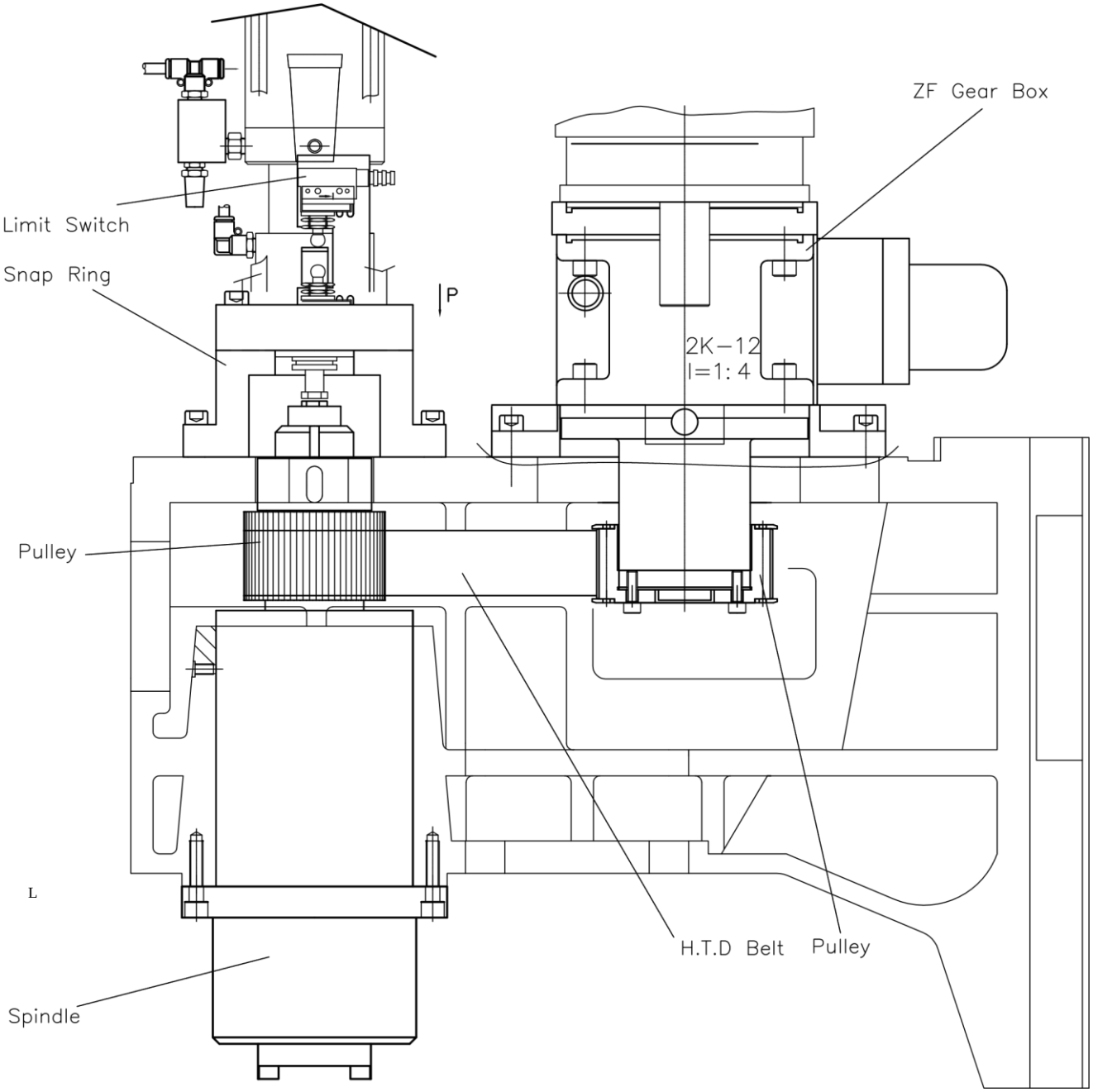
5-6-3 ATC Magazine Limit Switch: (See P4-24)

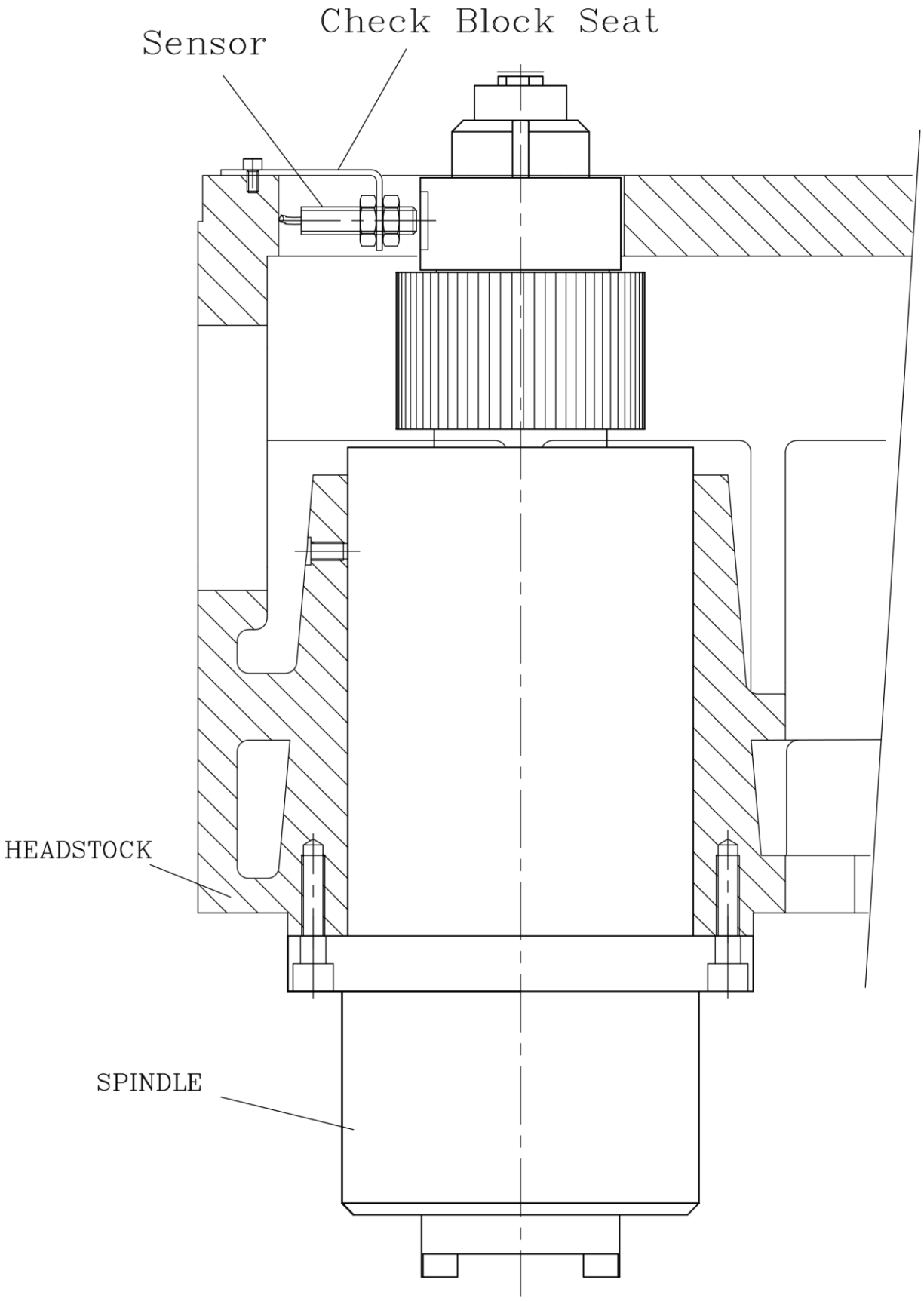
5-7 CHIP CONVEYOR: (See P4-29)

Chip convey is driven by gear reduction motor to activate chip spring to continuously clear chips and deliver them into the chip collecting tank.

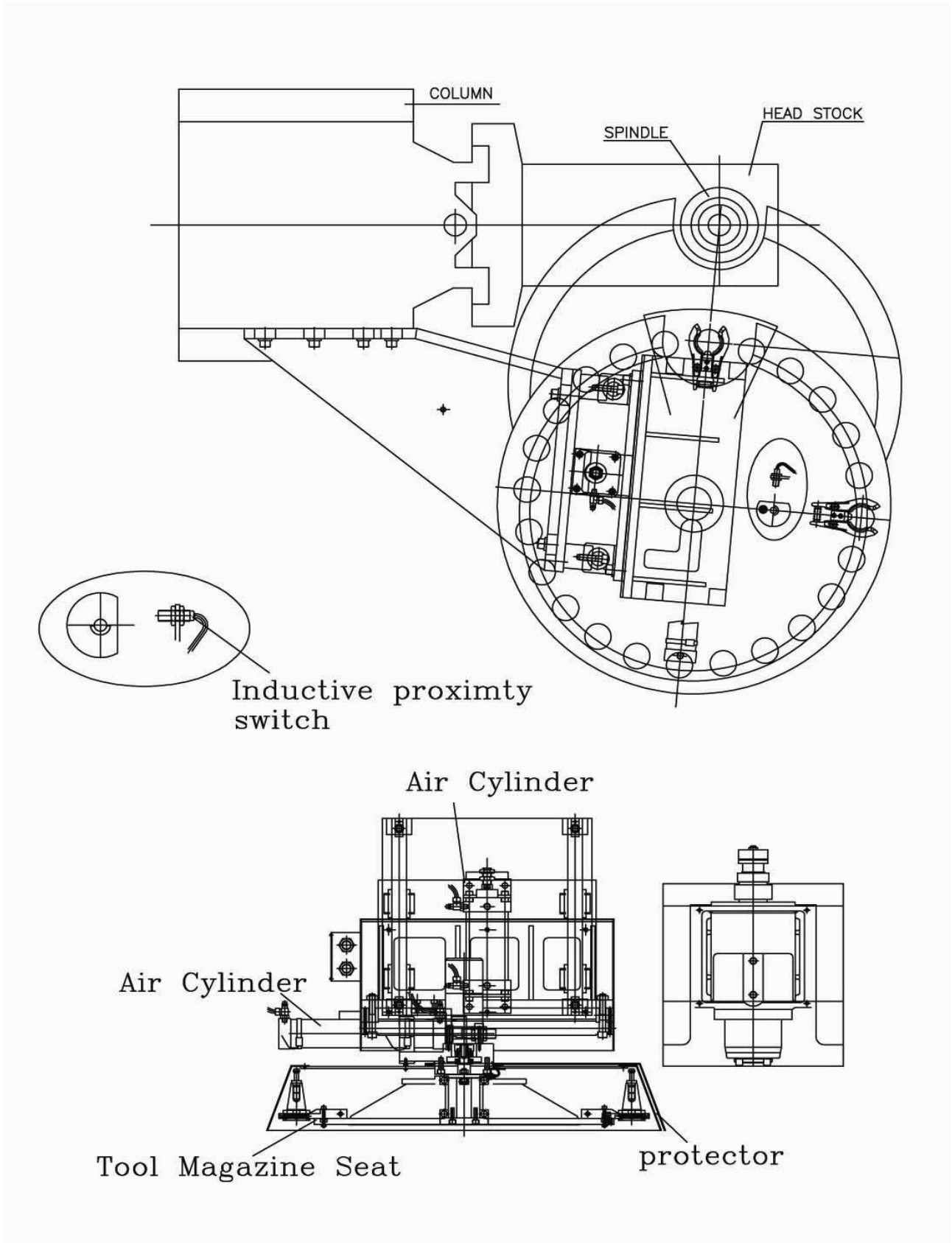
To prevent too many chips from sticking the chip spring, please open chip convey when chips are cut, otherwise when -too many chips stick the chip convey it will result in the motor burning up or breaking chip spring.

ISO40 spindle Transmission (with gear BOX)

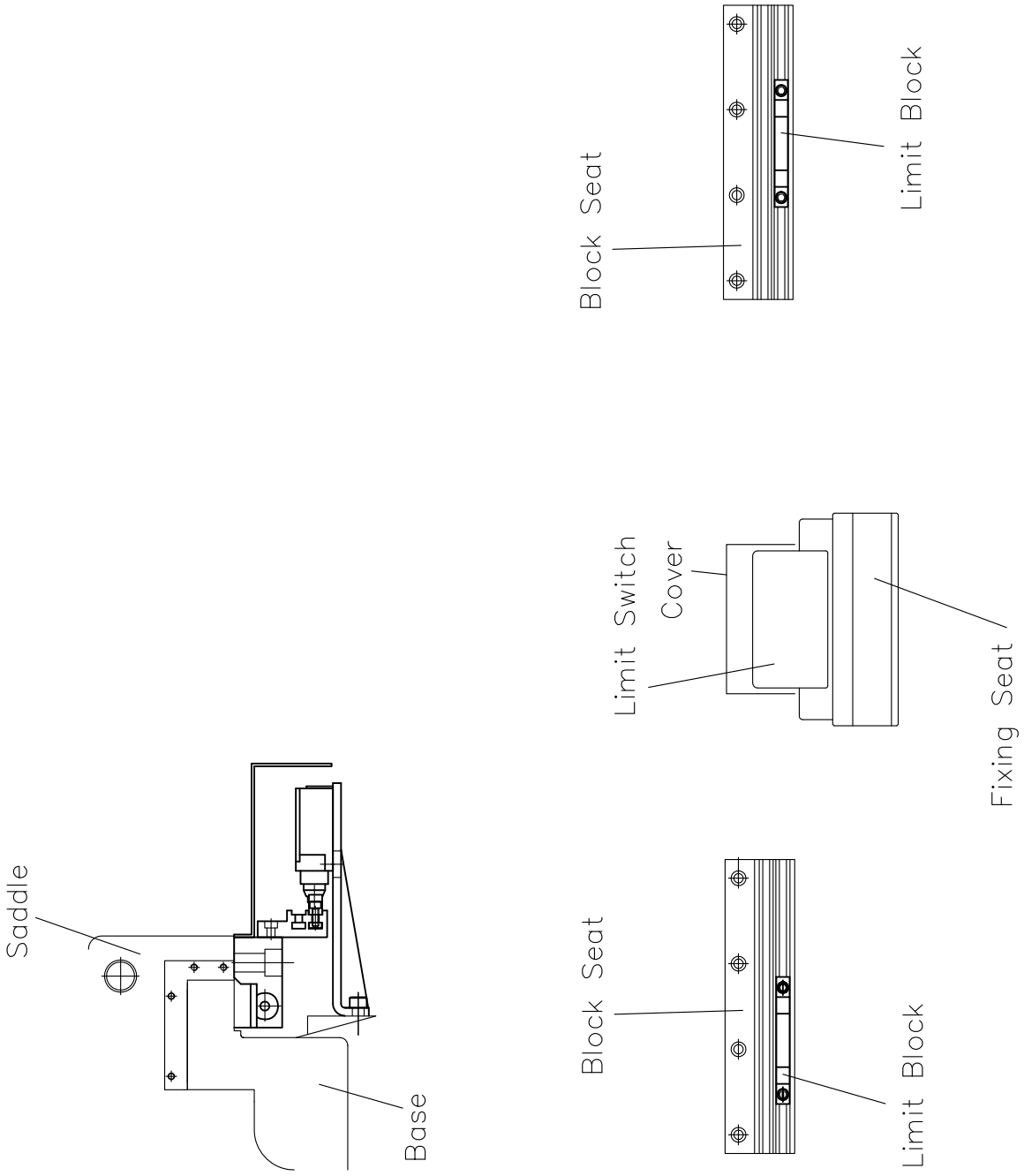



Sensor
Check Block Seat
HEADSTOCK
SPINDLE

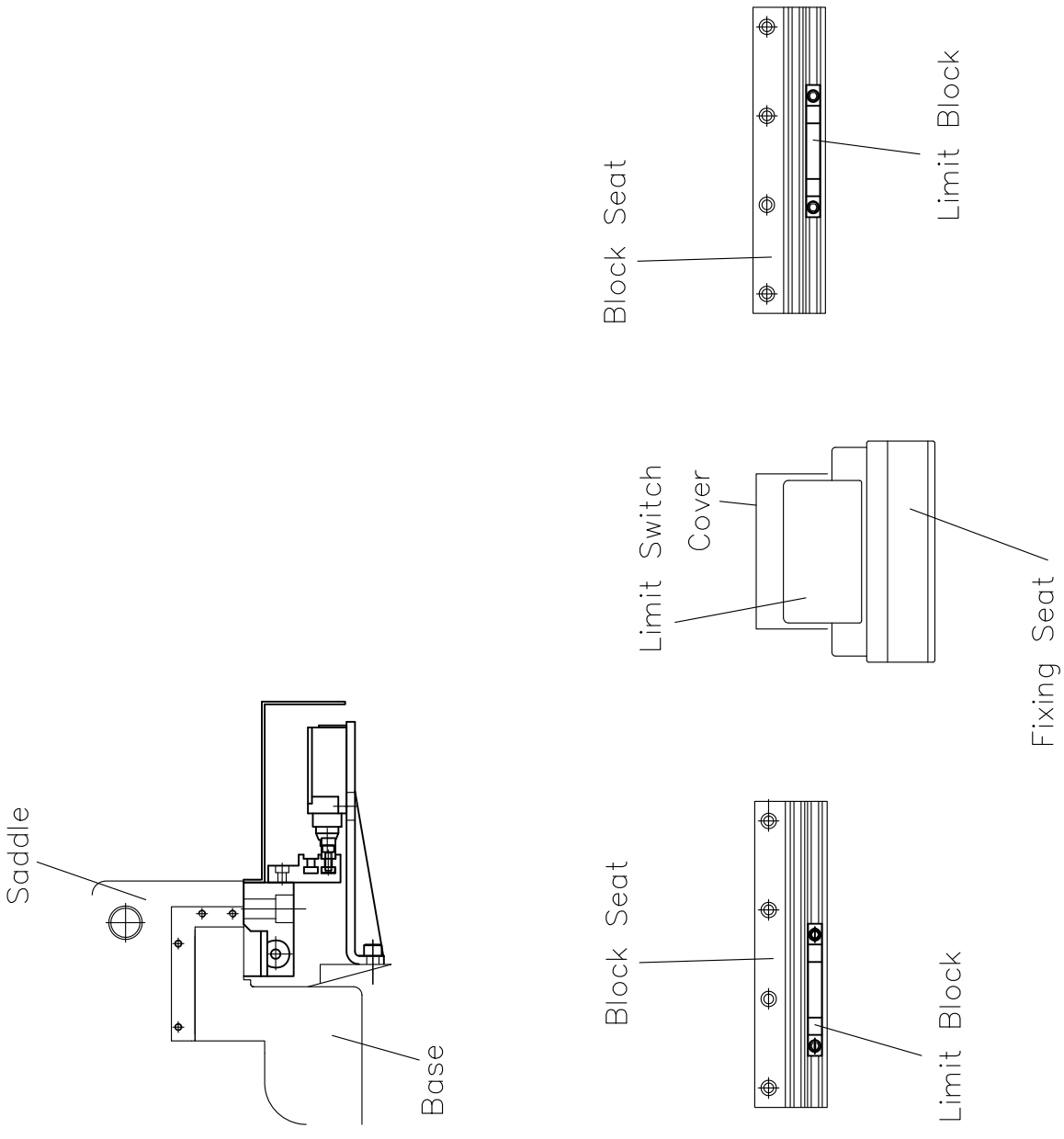
ATC MAGZINE


COLUMN
HEAD STOCK
SPINDLE
Inductive proximty switch
Air Cylinder
Air Cylinder
Tool Magazine Seat
protector

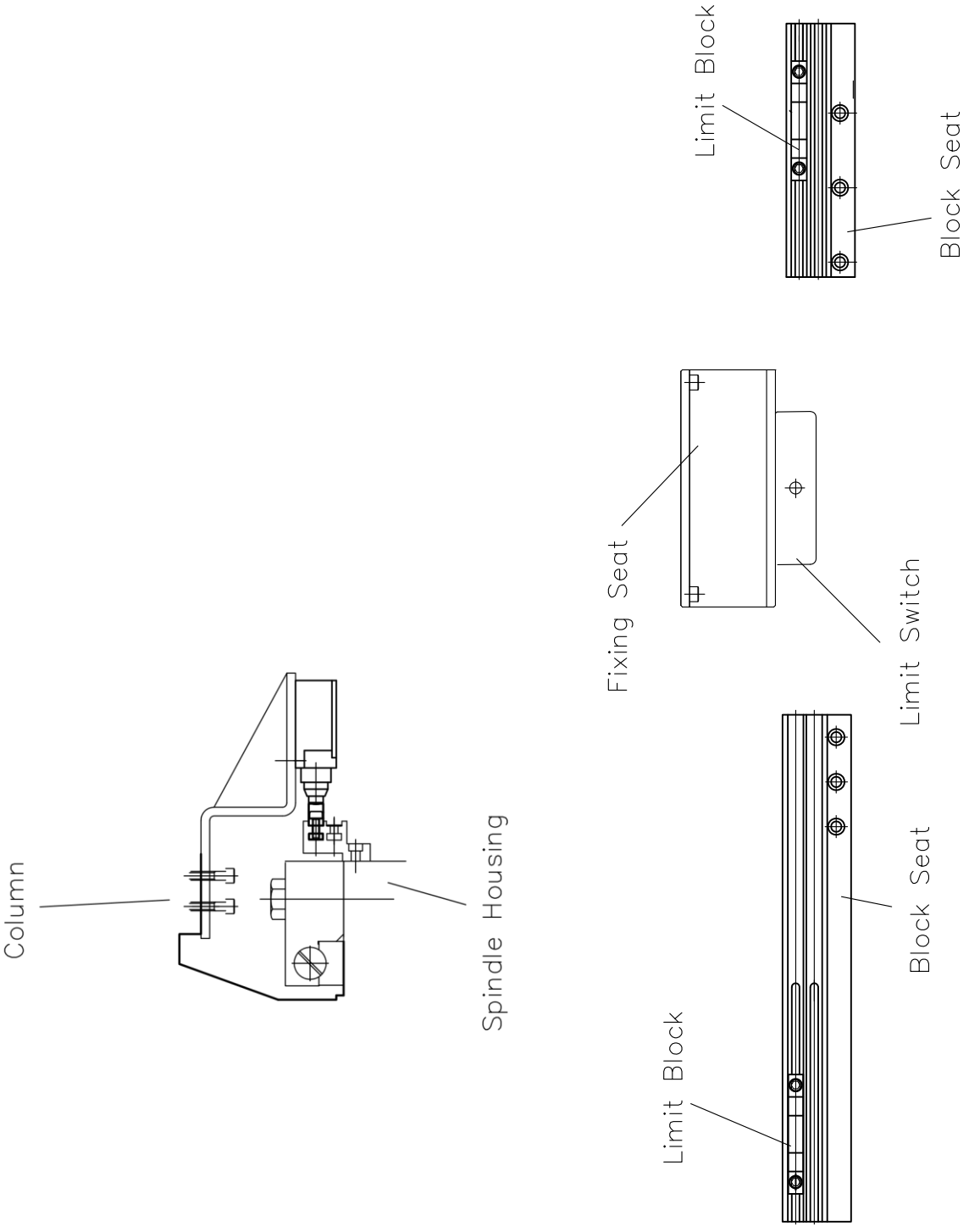
X-AXIS LIMIT SWITCH



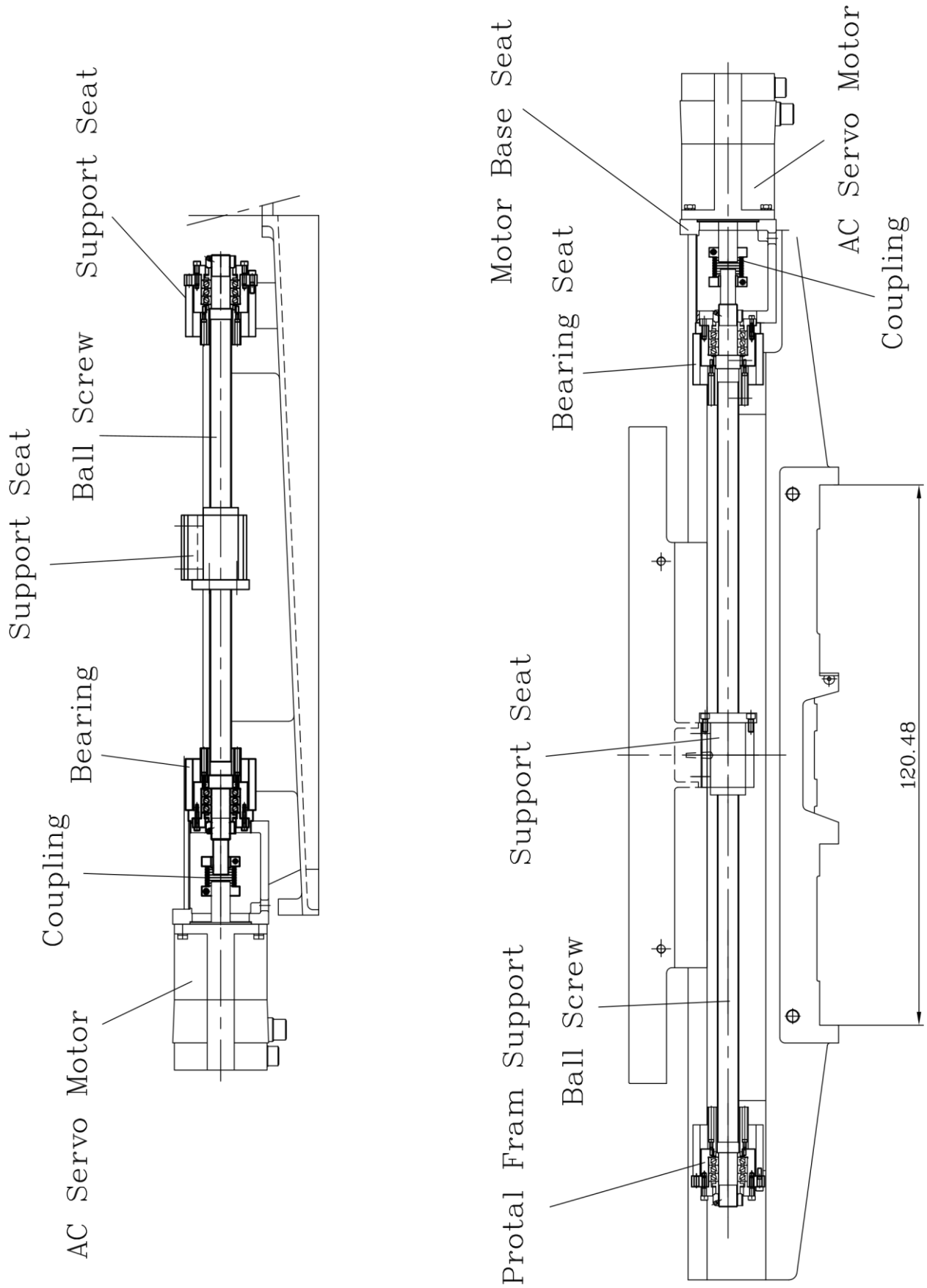
Y-AXIS LIMIT SWITCH



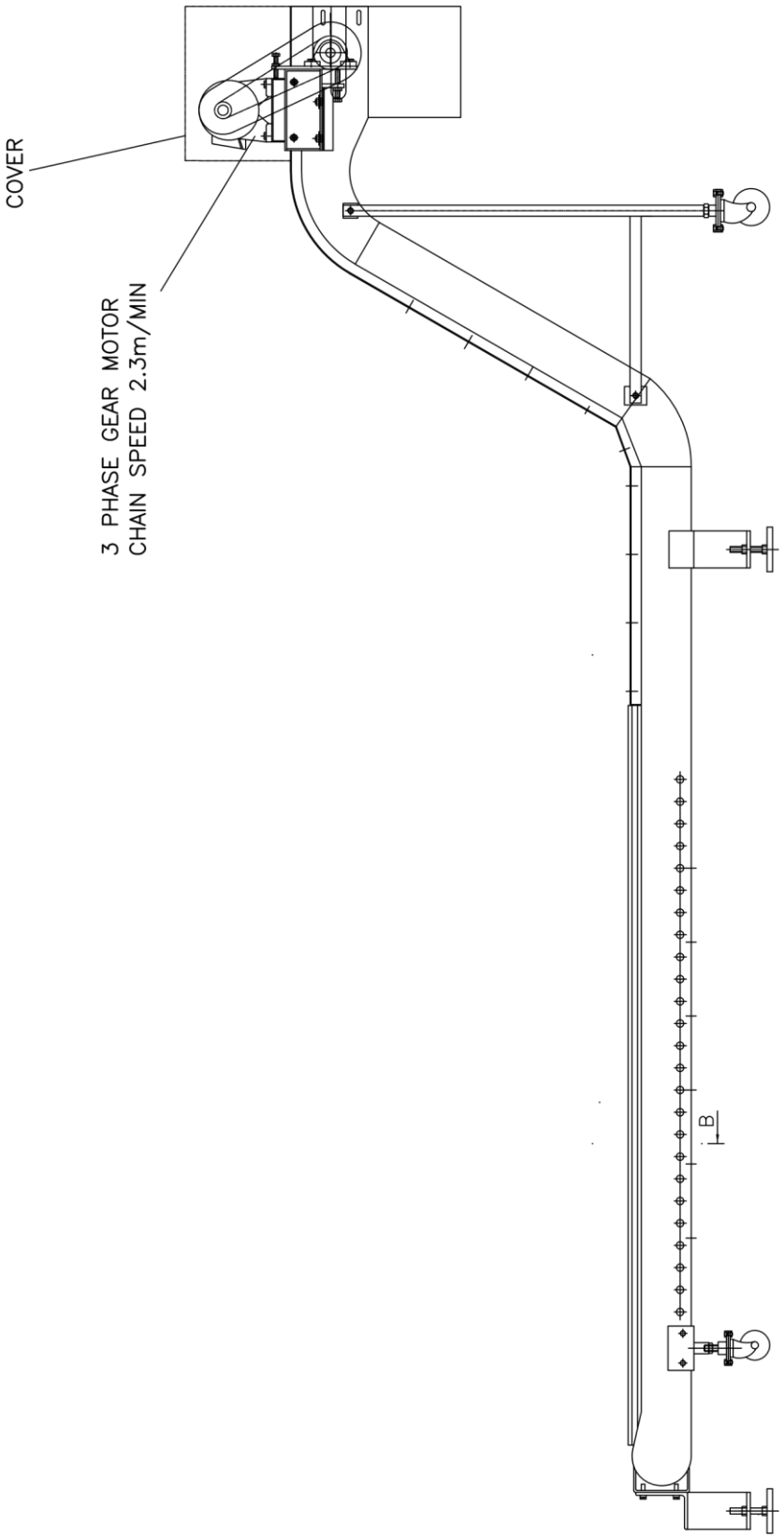
Z-AXIS LIMIT SWITCH



DIRECTLY CONNTER DRIVE



CHIP CONVEYOR



6. Mechanism Adjustment

1.6. Spindle Belt Adjustment

After a long period of operation, the spindle belt sometimes gets loosed, therefore, periodical inspection and adjustment is required.

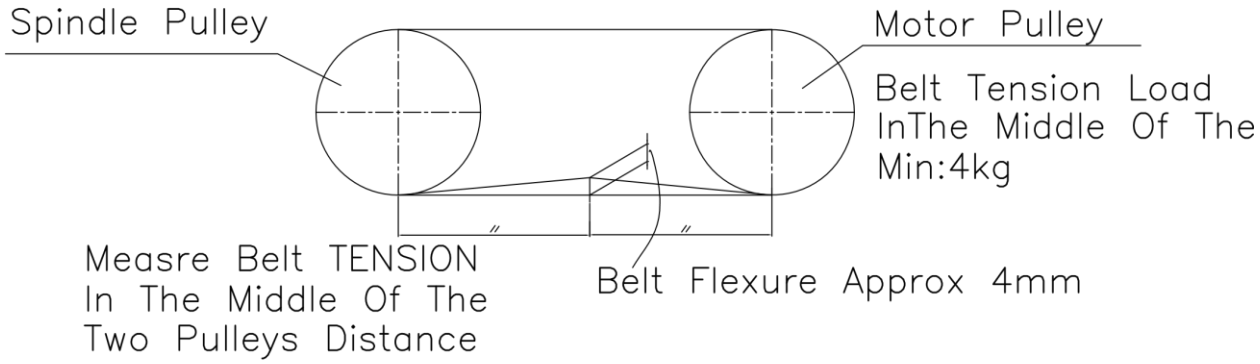
Adjustment Procedure:

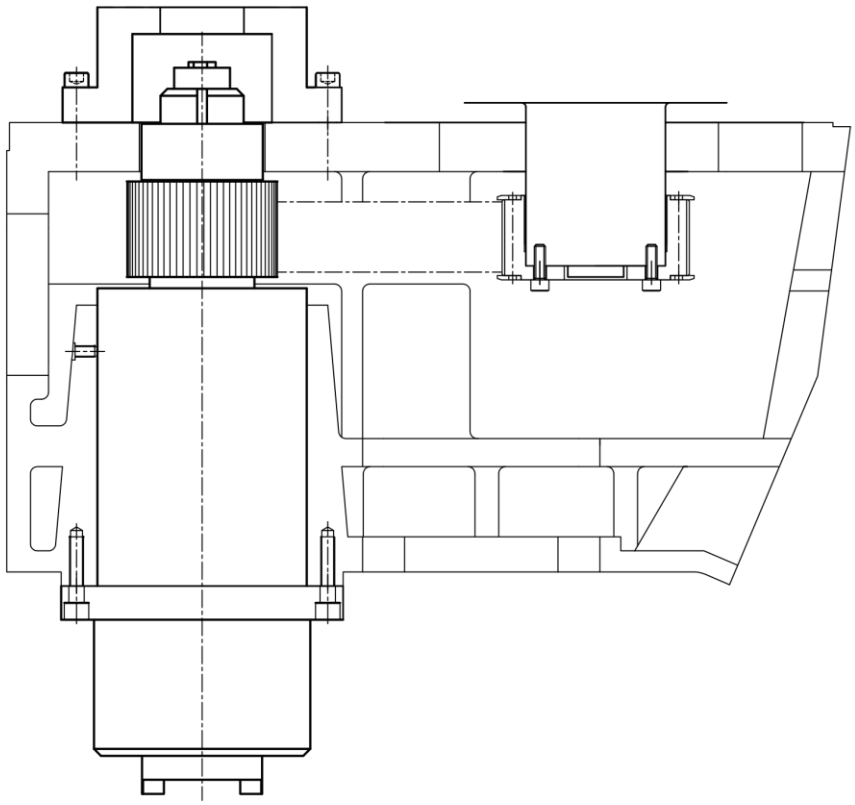
(1) Loosen the four fastening screws on the gear box base and two lock nuts on the adequate tension.

(2) Adjustment the adjusting bolts to adequate tension.

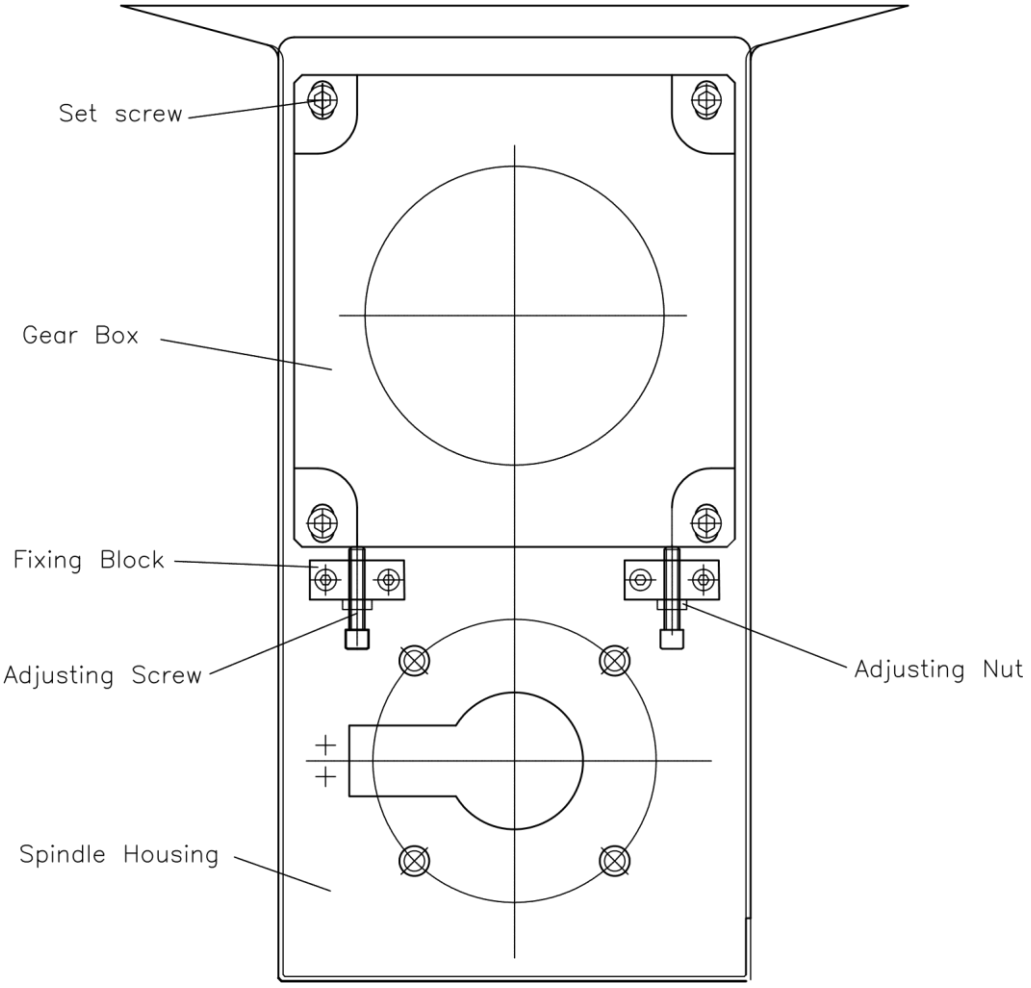
(3) Fasten the lock nuts.

(4) Fasten the four screws on the gear box.





Adjusting The Spindle Belt



6-2 Taper Gibs Adjustment

To eliminate the wear amount caused by long-term sliding between the two relative movement surface, this machine is equipped with taper gibs and parallel adjusting blocks.

Taper Gibs adjustment procedure:

(1) Loosen the small end bolts.

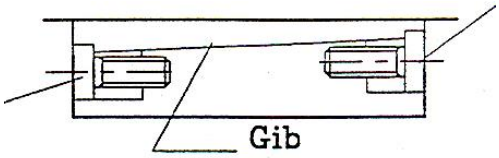
(2) Push the taper Gibs directly with a screw driver until the surface pressure is about 3.5 kg/cm.

(3) Fastening the big end bolts.

(4) Check the above mentioned parts at least once a year

Small End Tightening Bolt.

Big End Adjusting Bolt



Adjusting B1ock Adjustment

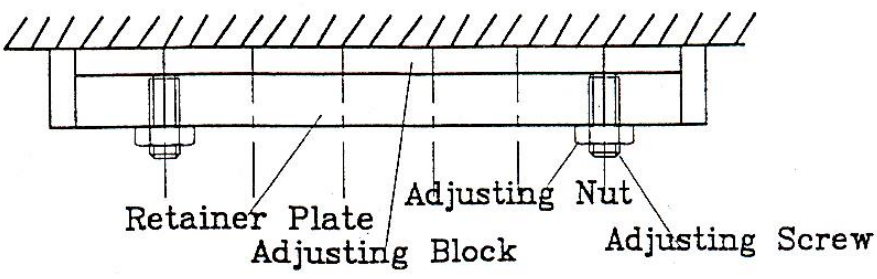
(1) Loosen adjusting nut.

(2) Adjust the adjusting screw and surface of adjusting

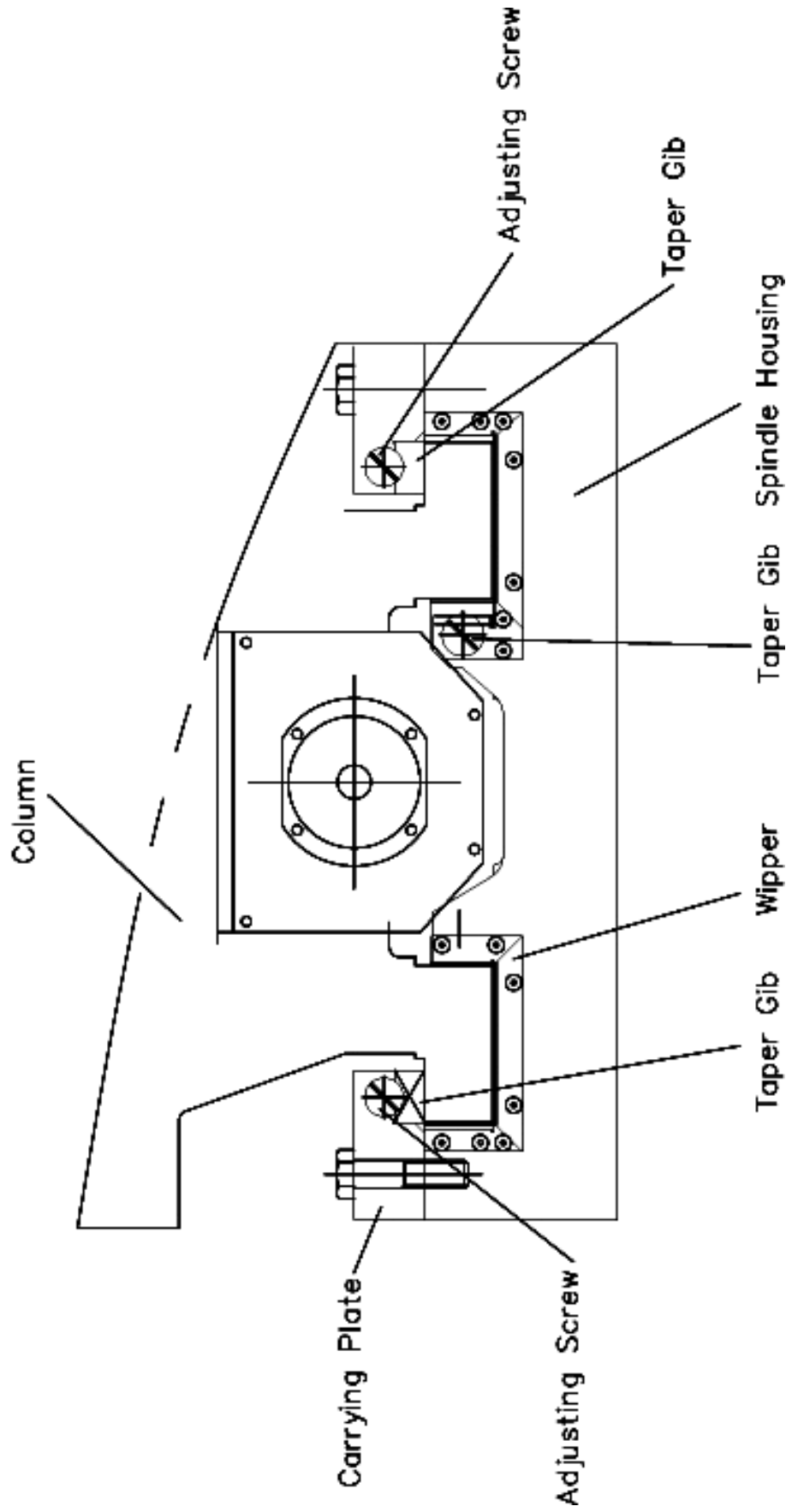
Block pressure is about 3.5 kg/cm.

(3) Fastening the big end bolts.

(4) Check the above mentioned parts at least once a year.



Adjusting The Z-Axis Taper Gib

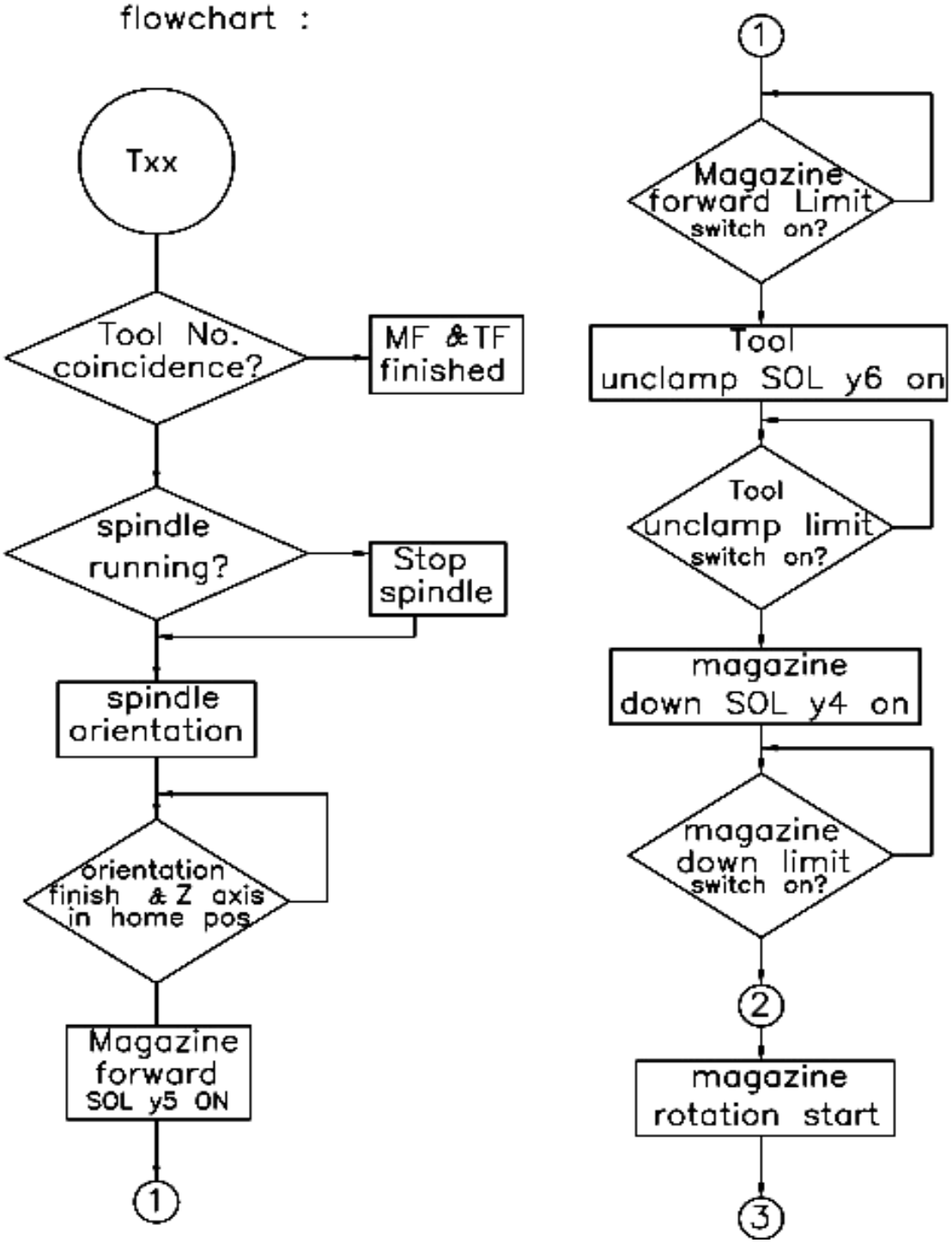


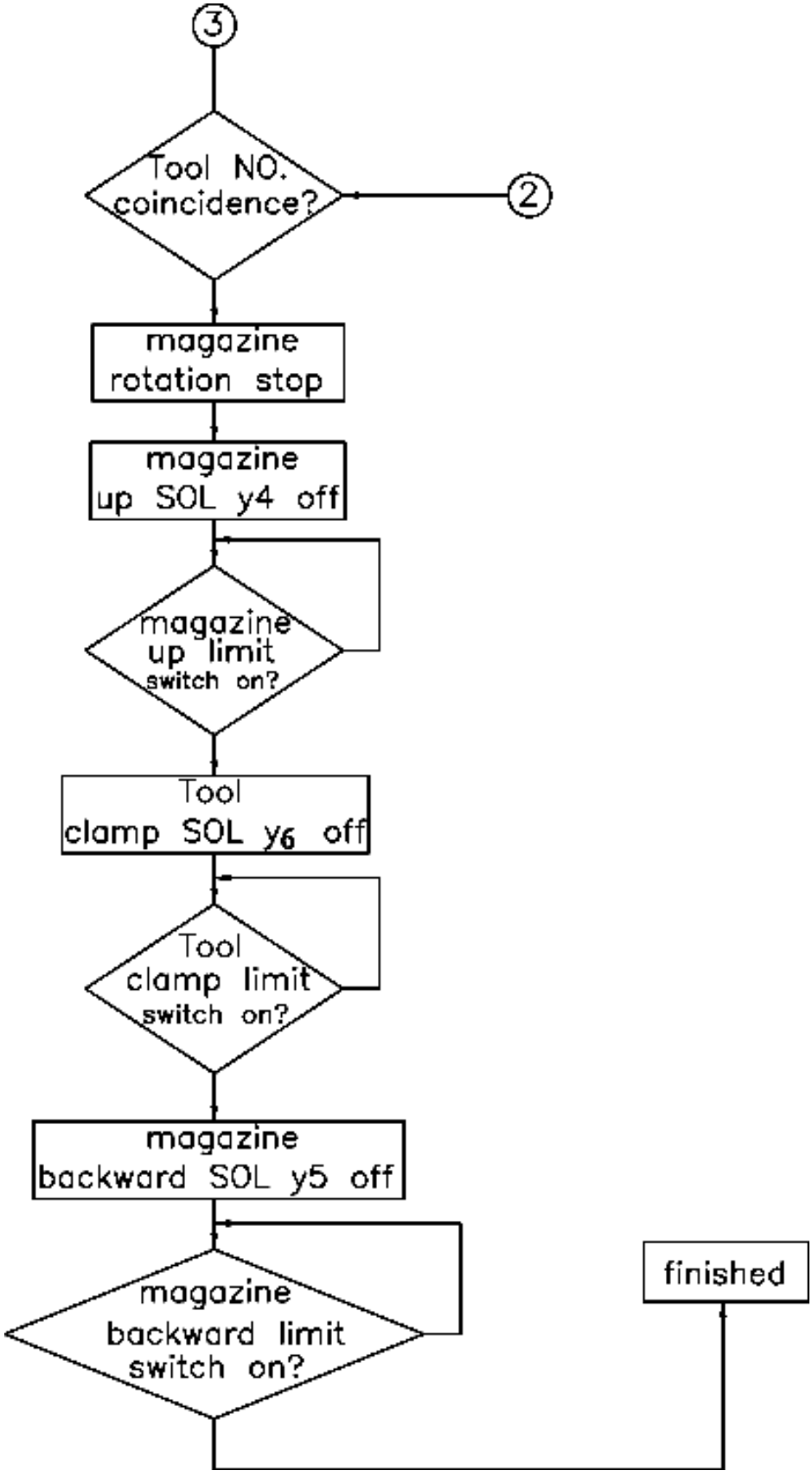
6-3 MAINTENANCE AND TROUBLE SHOOTING

1. ATC UNIT

(1) Tool change sequence

Tool change sequence is according to following flowchart :




3
Tool NO. coincidence?
2
magazine rotation stop
magazine up SOL y4 off
magazine up limit switch on?
Tool clamp SOL y6 off
Tool clamp limit switch on?
magazine backward SOL y5 off
magazine backward limit switch on?
finished

(2) If ATC stop at any position , please check:

a. The inlet air pressure, It must be at 6 ± 0.5 kg.cm
b. The corresponding function detection limit switch is working ok?
c. The solenoid valve of next motion is working?
d. Is the related relay working and its contact in good condition?
e. Is the cylinder working ok?
f. Any miss adjustment on ATC mechanism?
g. Any air leakage on the air system?

2. If the spindle is not running.

a. Is the inlet power supply voltage of the spindle drive
With in 380 VAC ± 10%?
b. Is there any alarm messages display on the spindle drive unit? If any ', please refer the maintenance book.
c. Is the wiring in good condition?
d. Is the high-low clutch is working ok?
e. Is the power HTD belts working ok?
f. Is the spindle tool clamp limit switch working ok?
g. If machine equipped with mechanical orientation mechanism, is the orientation off limit switch working ok?
h. If the spindle motor working ok?

3. If the coolant is not working.

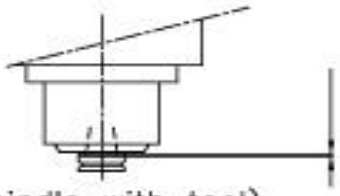
a. Is the coolant level of coolant tank too low?
b. Is the coolant system too dirt?
c. Is the relay & magnetic contactor working ok and its contact in good condition?
d. Is the coolant motor working ok?
e. Is the coolant pump working ok and any obstacles to stop the coolant to come out?
f. Is the wiring in good condition?

4. Align the Z axis home position with ATC.

Warning : If customer has removed the Z axis servo motor,
and mounted it back , the home position of Z axis home position will changed. The following procedures must be performed to align the Z axis home position to ATC unit, or the ATC will crash to the spindle head and damage to the machine

(1)Turn on the power of the machine. If the over travel alarm occurred, set the parameter No.745 to 9999999 to release the alarm, repertory the return to home operation.

(2) Set mode switch to JOG mode.Load a standard tool into the spindle. Use a thickness gauge to measure the gap between tool flange and the spindle nose , record the value and release the tool.



(spindle with tool)

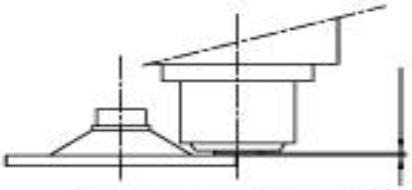
(3) Disconnect the air supply to the machine.

(4) Move the magazine to the spindle by hand slowly , be sure there is on tool on the pocket of magazine and spindle. Check if there is any obvious interference between tool pocket and spindle. If it is existed set mode select switch to HANDLE Z , use the manual pulse generator to move the Z axis untill the interference is vanished. Move the magazine back.

(5) Connect the air supply to machine.

(6) Operate solenoid valve SOL y5 to move the magazine to the spindle.

(7) Use the thickness gauge to measure the gap between the top surface of the magazine and the spindle nose.



(measure diagram)

(8) Use the data step (7) to subustact the data of step (2).Add the result the value of parameter No.30600 , and set the result to the parameter No.30600.

(9) Reperform the axis return haome opration.

(10) Set to MDI mode , perform automatic tool change to check the Z axis home poisition , make correct if it is necessery.

6-4 Maintenance of Electric Box cooling Unit:

After electric box cooling unit has been used for a long period of time, It can produce vibration, noise or oil accumulated and dirt's. So, periodic maintenance must be done to reach working efficiency. Although the heat exchanger only has fan as power which has reduced the maintenance work to the minimum, please still keep periodic maintenance.

Please accord to the following list for maintenance:

* Range of work:

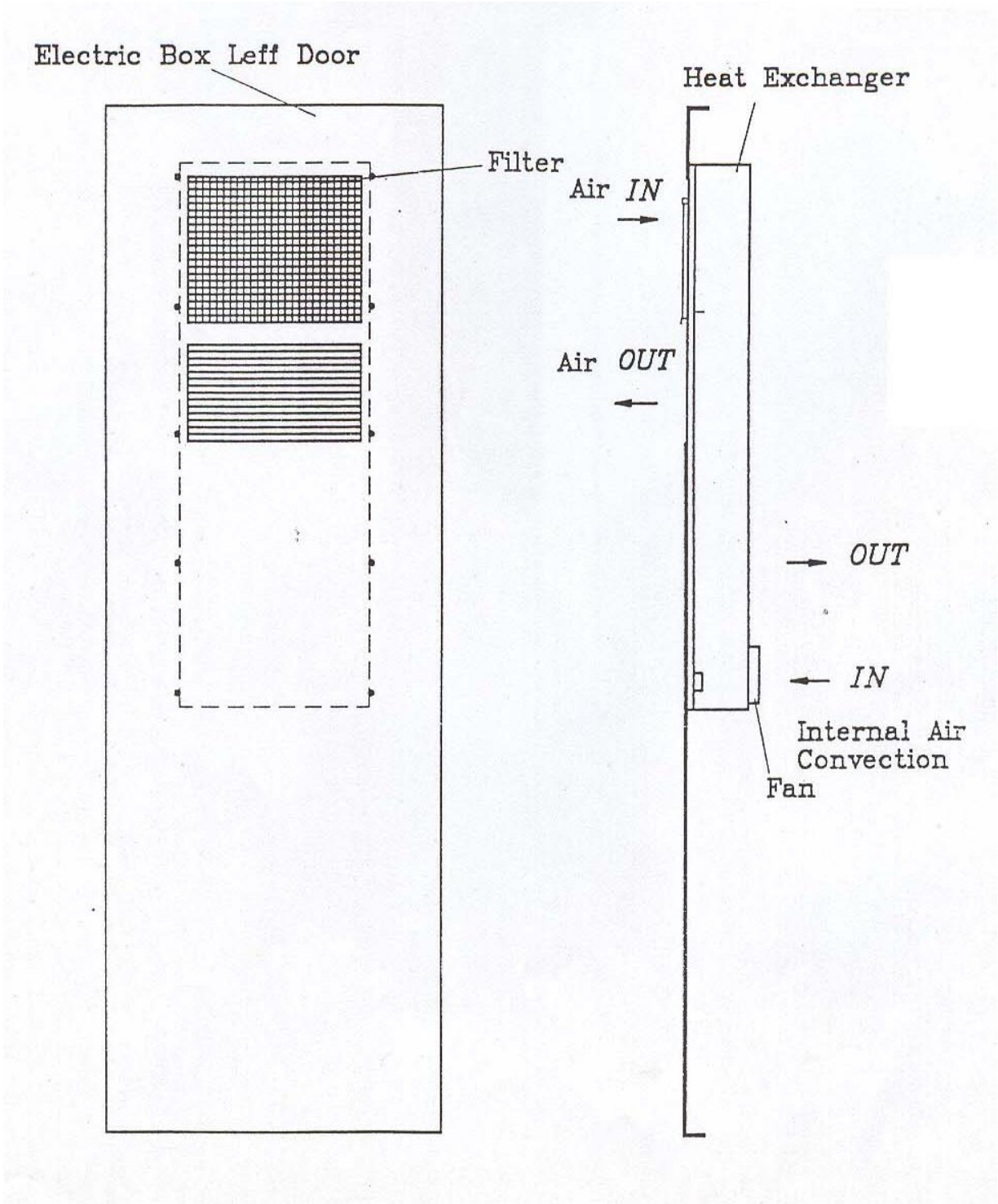
(1) Min./Max. temperature: -29/68°C

(2) Place of installation:

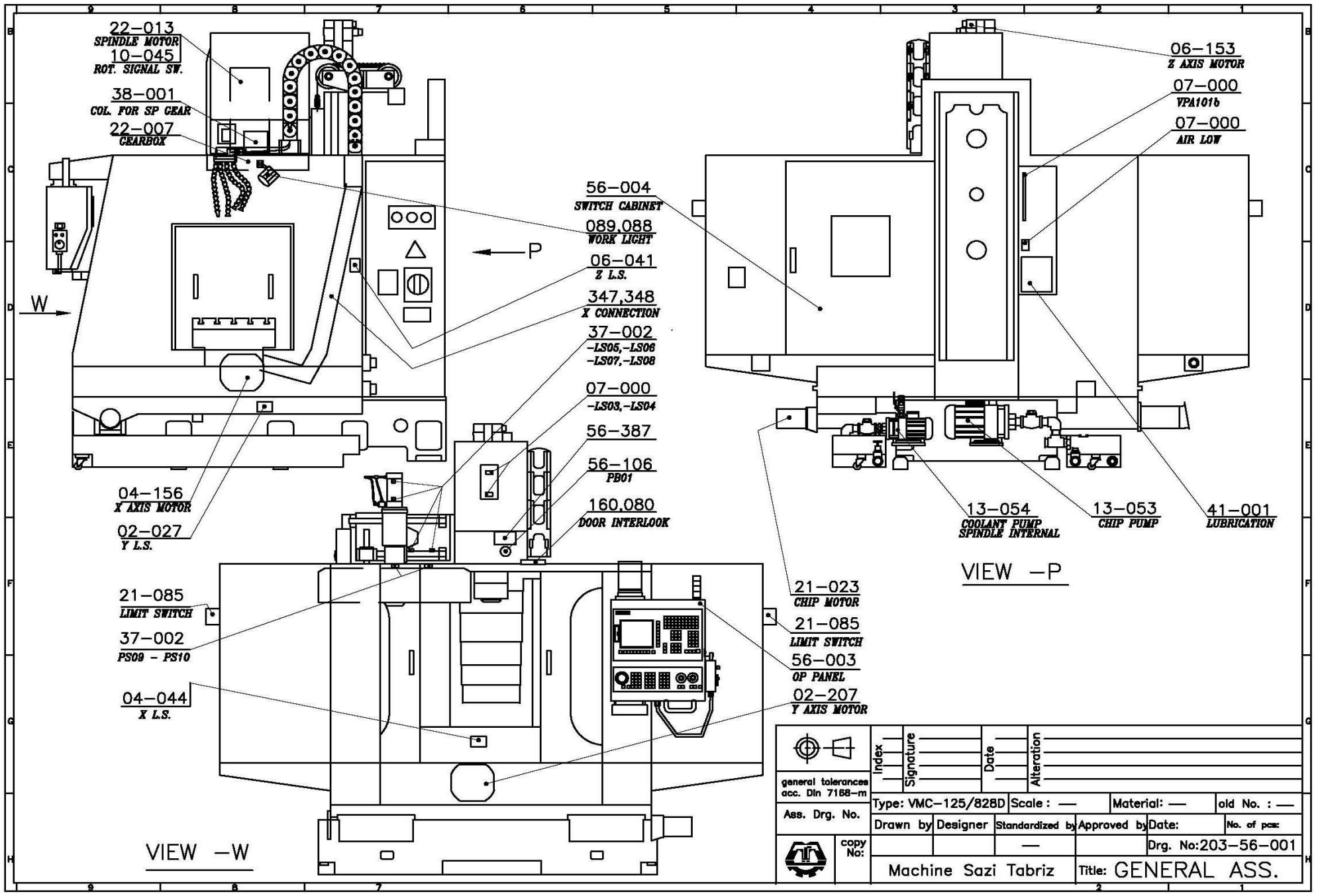
- Install at cool or waterproofed suitable place.
- Avoid corrosive atmosphere.

TIME	PART	CHECKING POINT	GUIDES
Every day (After initial use)	Inner/outer fan	Check if blades' rotation is normal and if there is noise or vibration, occurring.	If abnormal is found, find out the cause. If fan is out of order, replace it.
Weekly or monthly	Filter	Oil accumulated, Dirt's	(1) For slight dirt's, lightly tap filter or clear them by dust extractor. (2) For heavy dirt's, wash with neutral cleaner or water and then remove water on filter. After it's dry, return it to the Original place.
Every 6 months or one year. (Please switch off machine)	Outer fan		(1) Remove filter and fan. Clear them with compressed air until they are clean.

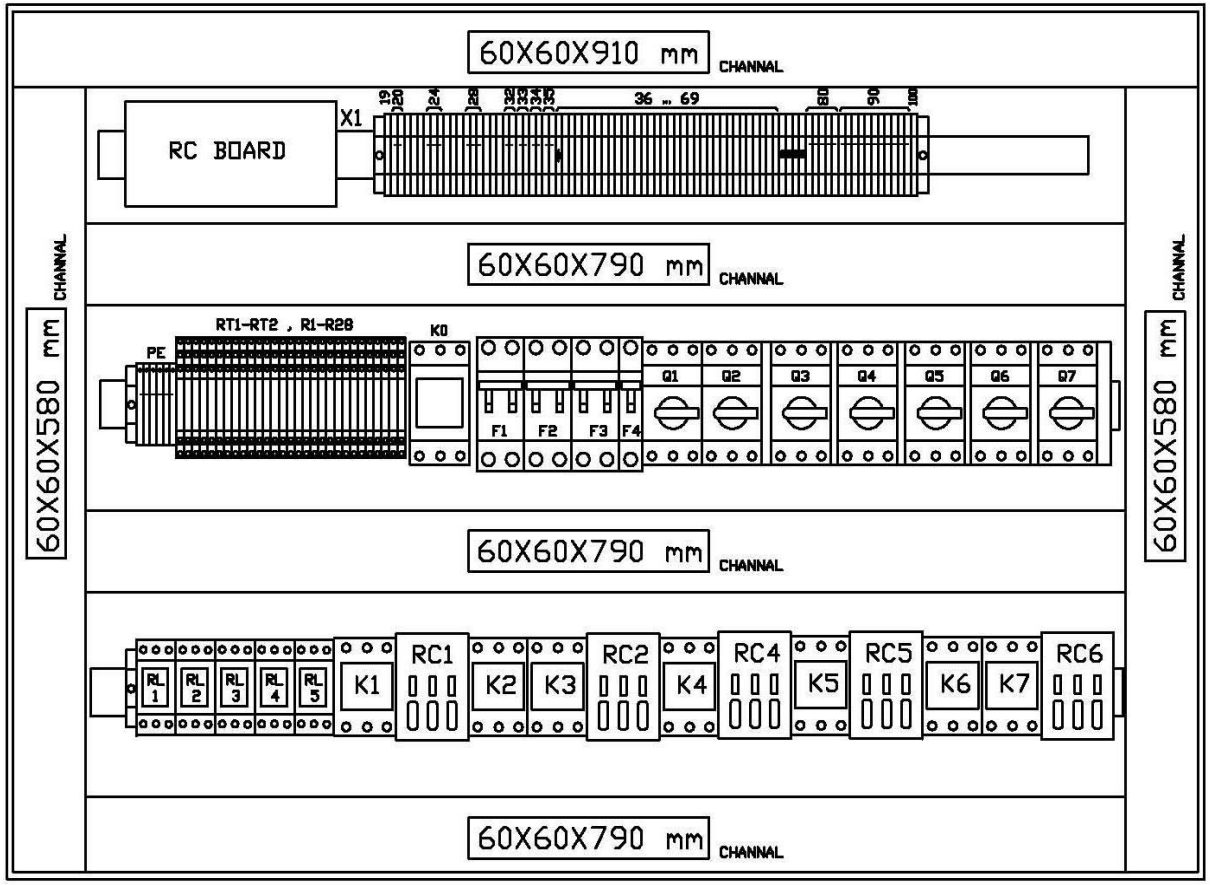
* Periodically and-thoroughly-clear filter and fan every time


Electric Box Leff Door
Heat Exchanger
Filter
Air IN
Air OUT
OUT
IN
Internal Air
Convection
Fan

V. ELECTRICAL DIAGRAM

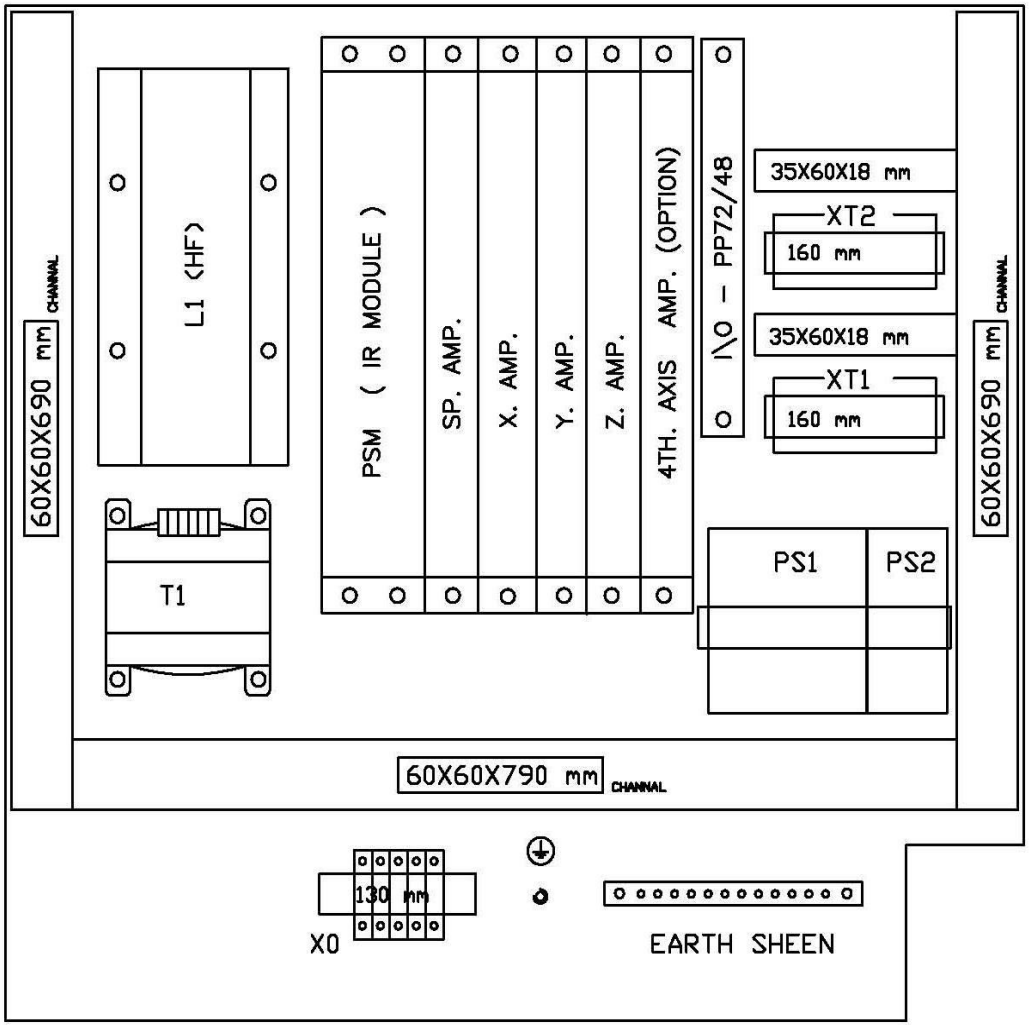

22-013
SPINDLE MOTOR
10-045
ROT. SIGNAL SW.
38-001
COL. FOR SP GEAR
22-007
GEARBOX
W
P
56-004
SWITCH CABINET
089,088
WORK LIGHT
06-041
Z L.S.
347,348
X CONNECTION
37-002
-LS05,-LS06
-LS07,-LS08
07-000
-LS03,-LS04
56-387
56-106
PB01
160,080
DOOR INTERLOOK
04-156
X AXIS MOTOR
02-027
Y L.S.
21-085
LIMIT SWITCH
37-002
PS09 - PS10
04-044
X L.S.
VIEW -W
06-153
Z AXIS MOTOR
07-000
VPA101b
07-000
AIR LOW
13-054
COOLANT PUMP
SPINDLE INTERNAL
13-053
CHIP PUMP
41-001
LUBRICATION
VIEW -P
21-023
CHIP MOTOR
21-085
LIMIT SWITCH
56-003
OP PANEL
02-207
Y AXIS MOTOR
general tolerances
acc. Din 7168-m
Ass. Drg. No.
copy No:
Index
Signature
Date
Alteration
Type: VMC-125/828D
Scale : —
Material: —
old No. : —
Drawn by
Designer
Standardized by
Approved by
Date:
No. of pcs:
—
Drg. No:203-56-001
Machine Sazi Tabriz
Title: GENERAL ASS.

COMPONENTS :	POSITION
CHANNEL	030
MOUNTING RAIL	051
Q1	054
Q4	055
Q2	056
Q3,Q6,Q7	057
Q5	058
K1-7	062
RC	068
F1-3	083
F4	085
K0	061
R1 ... R28	063
RT1 , RT2	063
RL1 ... RL5	064
RC BOARD	112
UPPER CONTACTOR PANEL	603
BLIND RIVET H4 X 10	192
WASHER 4.3	191
SCREW M4x10	164

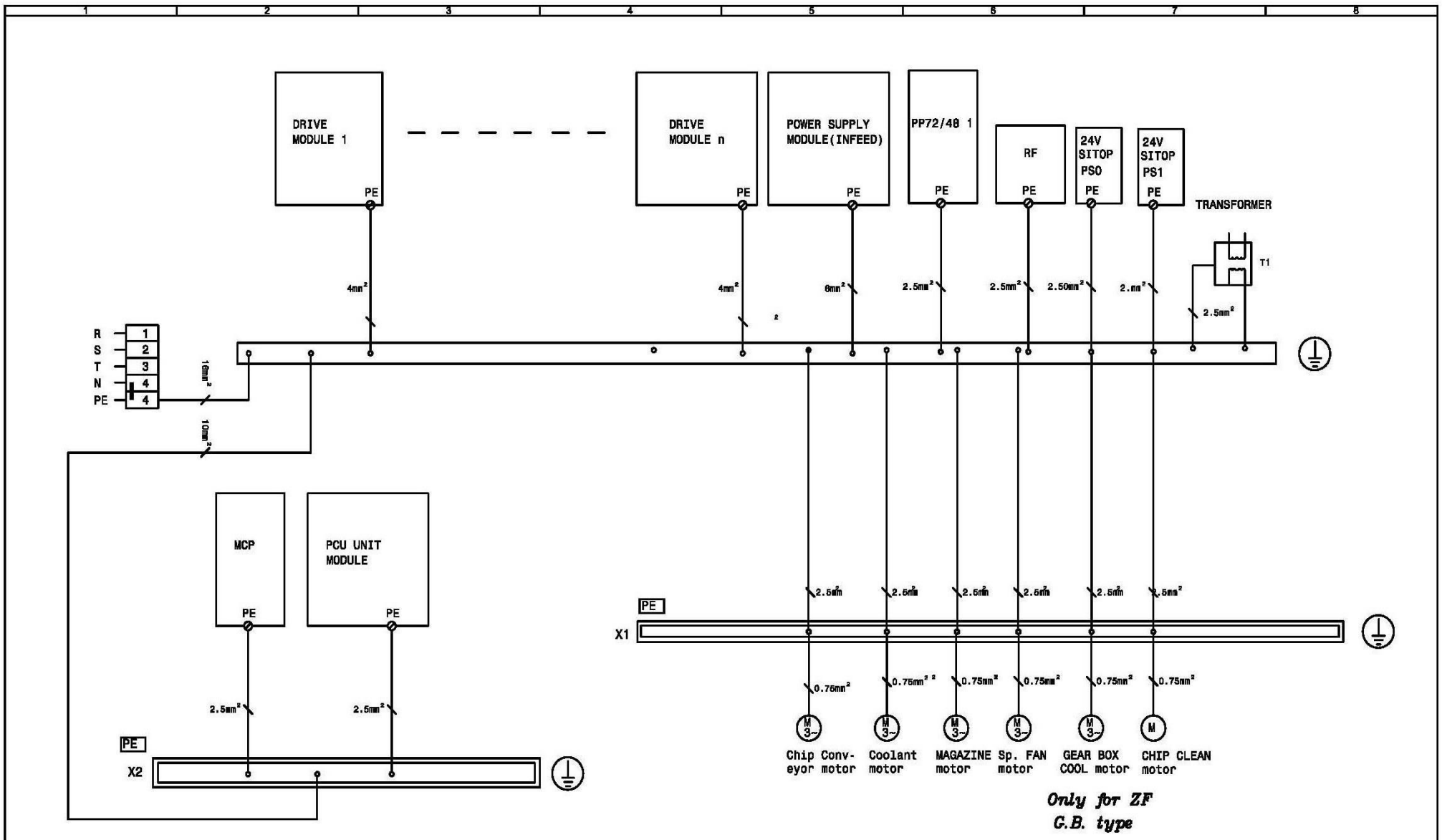


general tolerances acc. Din 7168-m	Index	Sign.	Date	Alter.		
Ass. Drg. No. :	Type: VMC-125/828D		Scale : ----	Material : -----	old No.: ----------	
	Drawn by	Designer	Standardized by	Approved by	Date:	No. of pcs:
COPY NO:			----		Drg.No: 203-56-004	I/III
	Machine Sazi Tabriz			Title: SWITCH CABINET ASS.		

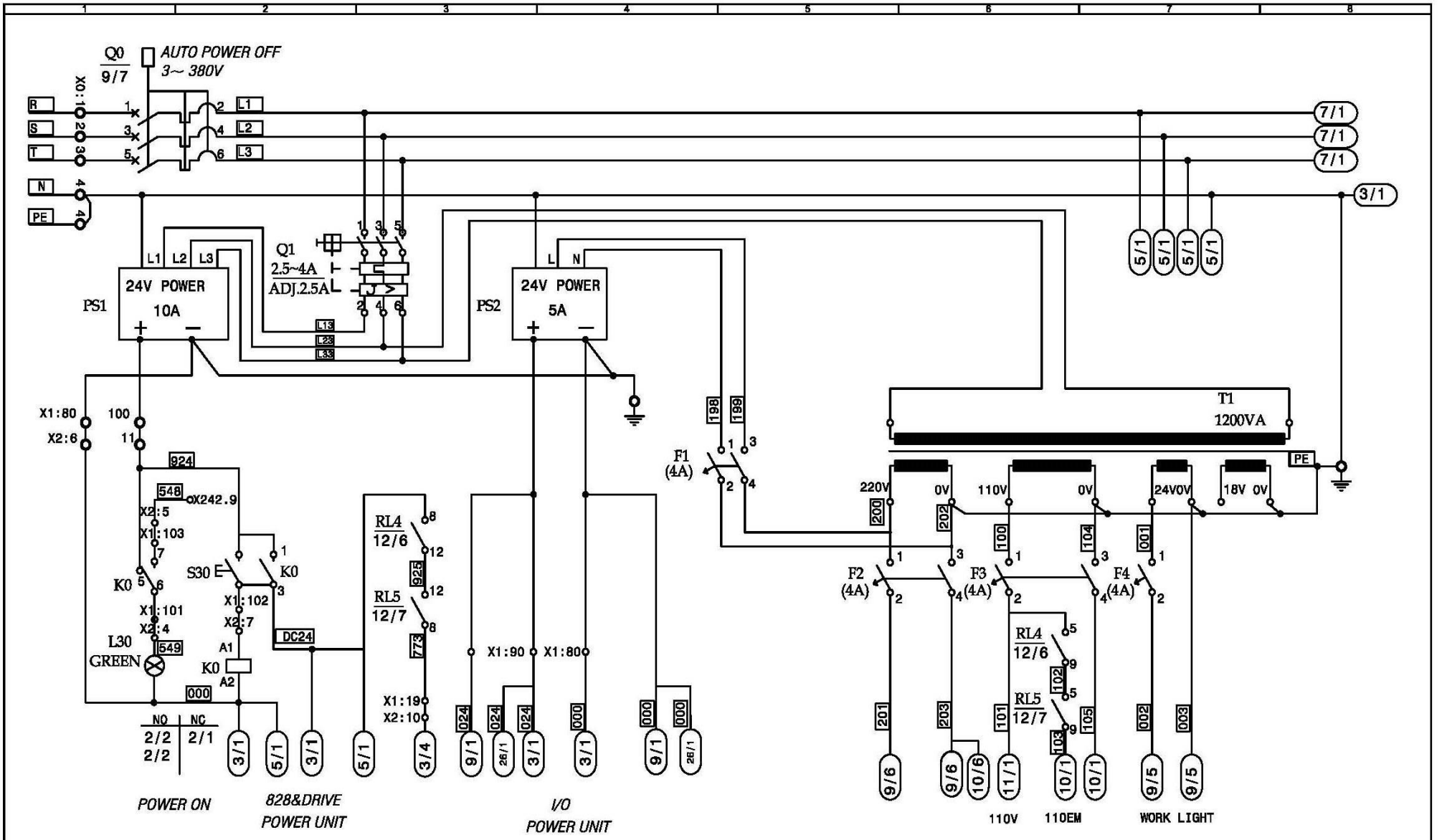
COMPONENTS :	POSITION
CHANNEL	029,030
MOUNTING RAIL	051
LOWER CONTACTOR PANEL	604
L1 (HF)	215
PSM (IR MODULE)	213
SP. & X. &Y. & Z. AMP.	210
I/O PP7248	205
PS1	071
PS2	072
XT1 , XT2	066
T1	070
EARTH SHEEN	633
SCREW M6 X 16	178
WASHER 6.3	179
X0	47,48,49,164,165
WASHER 4.3	191
SCREW M4x10	164



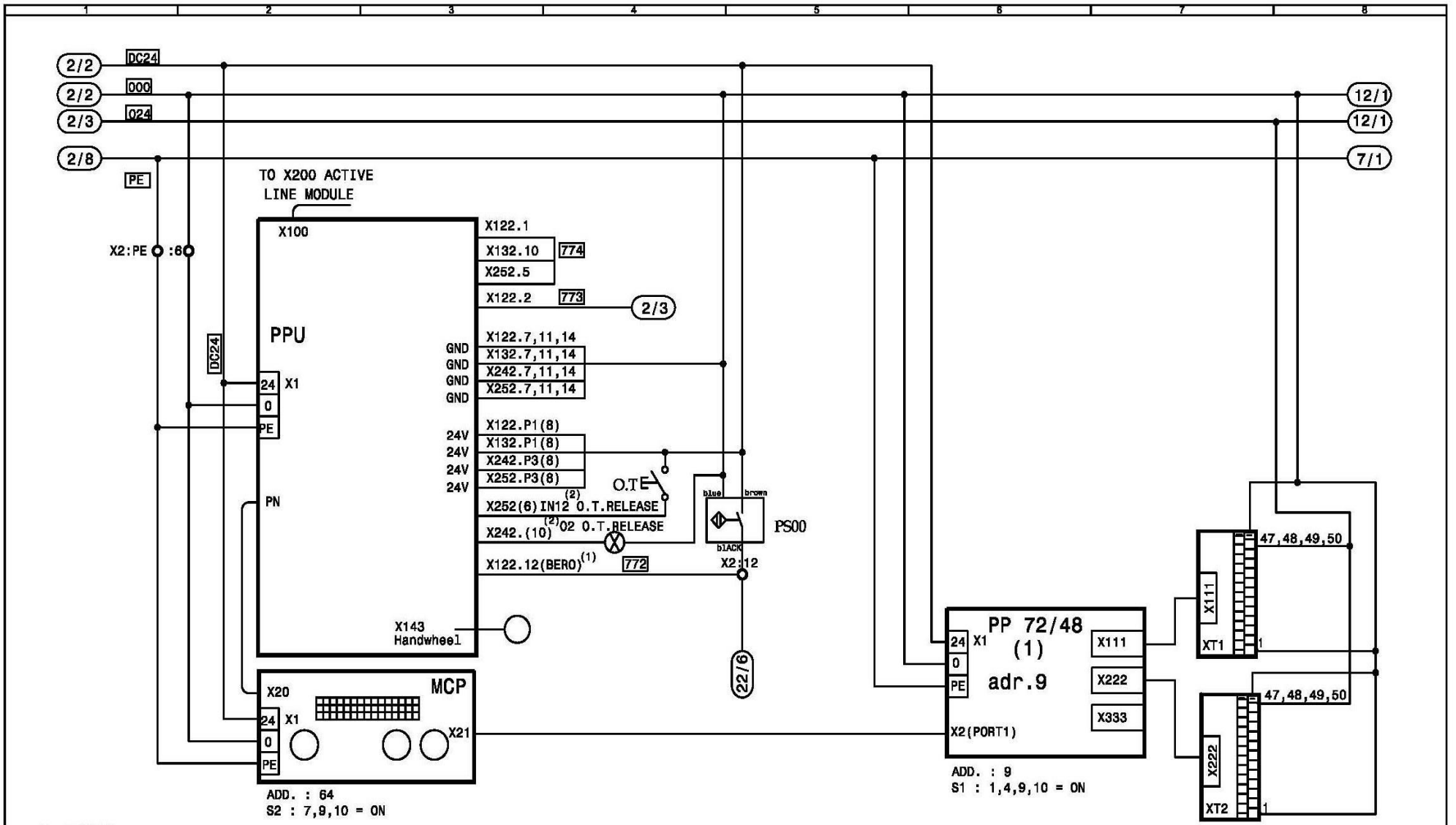
general tolerances acc. Din 7168-m	Index	Sign.	Date	Alter.		
Ass. Drg. No. :	Type : VMC-125/828D		Scale : ----	Material : -----	old No.: ----------	
	Drawn by	Designer	Standardized by	Approved by	Date:	No. of pcs:
COPY NO:			----		Drg.No: 203-56-004	II/III
	Machine Sazi Tabriz			Title: SWITCH CABINET ASS.		



ALTERATION	DATE	SIGNATURE	INDEX	DRAWNED	DATE	SIGNATURE		TITLE: PROTECTION EARTH	203-56-006
				CHECKED					Pg. 1
				STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D Sh.No. 38
				VERIFIED					
				APROVED					



ALTERATION		DATE	SIGNATURE	INDEX	DRAWNED	DATE	SIGNATURE		TITLE: POWER SUPPLY	203-56-006	Pg. 2
					CHECKED						
					STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
					VERIFIED						
					APROVED						



(1): For 1050,1250

(2): For MCP USB

ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: CONTROL POWER

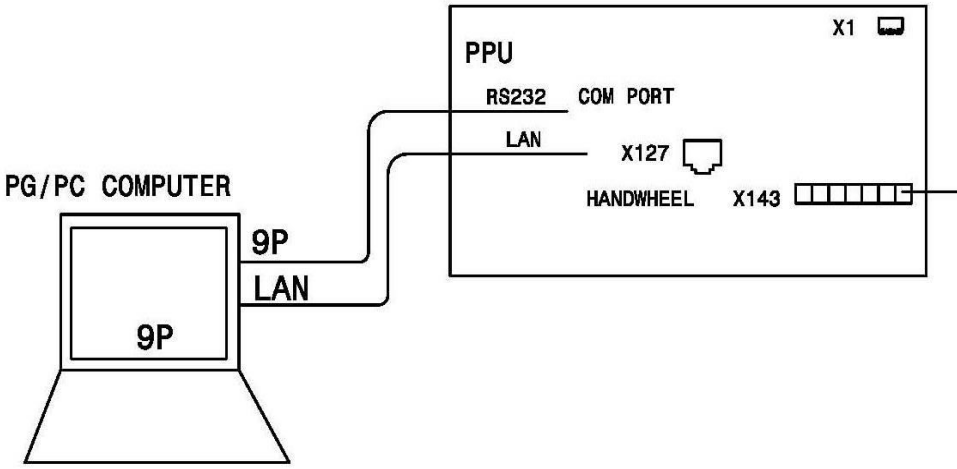
REPEATED TYPE:191,192,266

203-56-006

TYPE: VMC 125/SIEMENS828D

Pg. 3

Sh.No. 38



X143

PIN	NAME	DESCRIPTION
1	3P5	5 V DC supply voltage
2	M	Ground (GND)
3	1A	Track A, channel 1
4	X1A	Track A_N, channel 1
5	1B	Track B, channel 1
6	X1B	Track B_N, channel 1
7	3P5	5 V DC supply voltage
8	M	Ground (GND)
9	2A	Track A, channel 2
10	X2A	Track A_N, channel 2
11	2B	Track B, channel 2
12	X2B	Track B_N, channel 2

ALTERATION | DATE | SIGNATURE | INDEX | DRAWNED | CHECKED | STANDARD | VERIFIED | APROVED | DATE | SIGNATURE

TITLE: RS 232

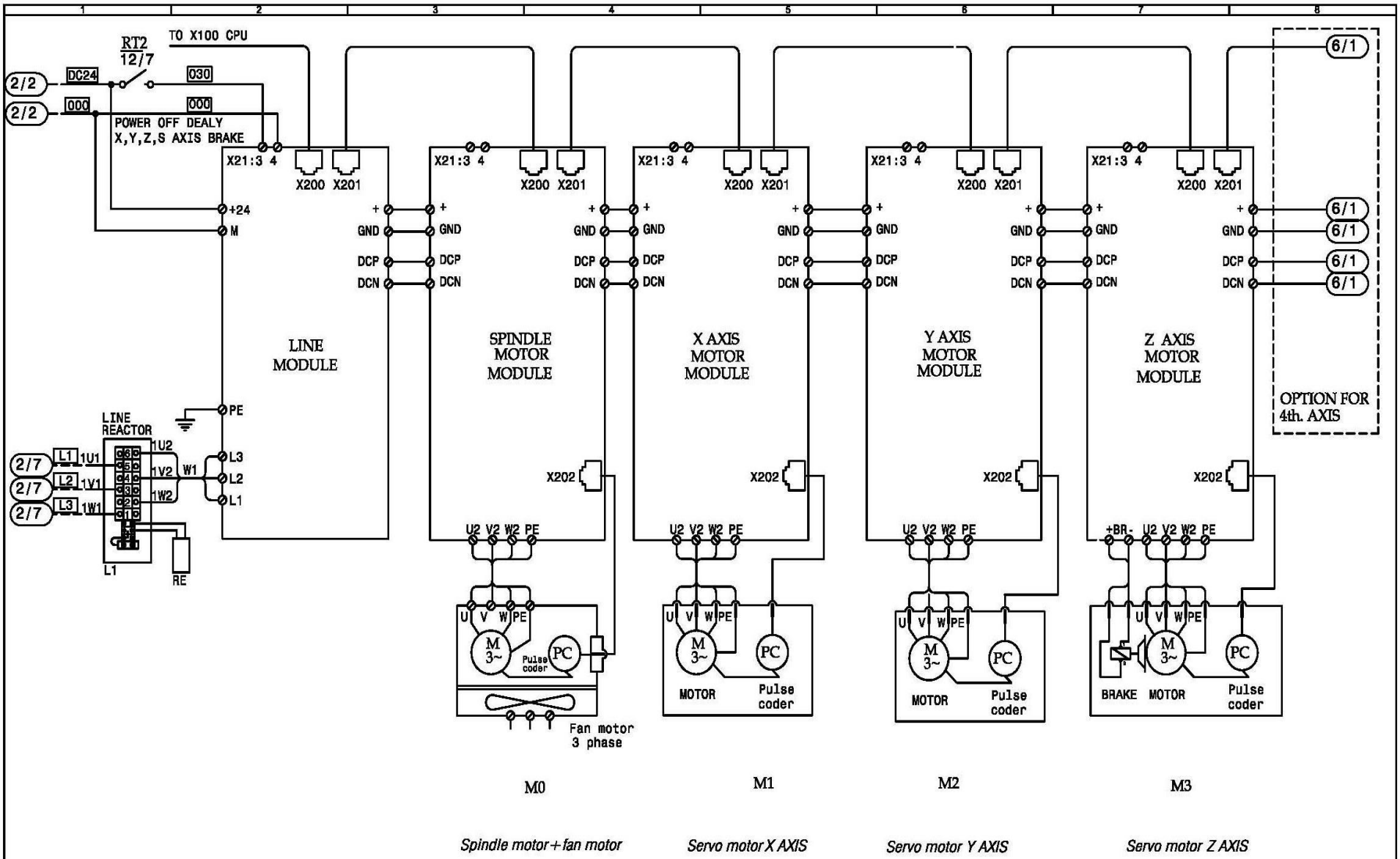
REPEATED TYPE:191,192,266

203-56-006

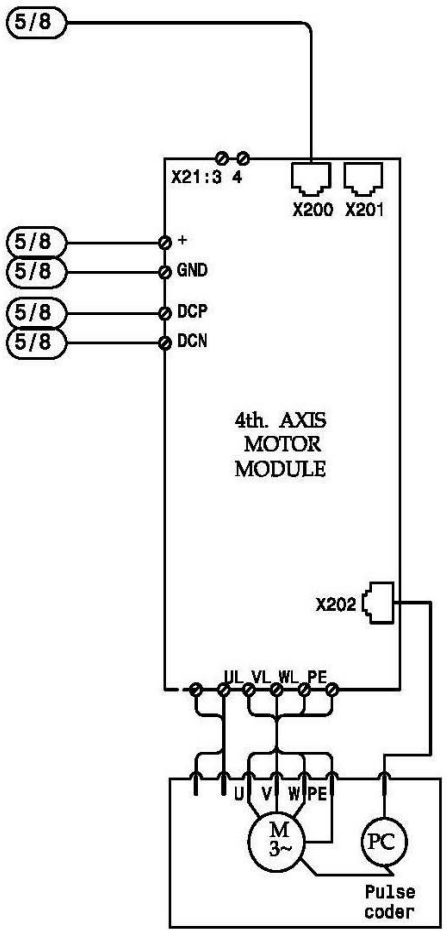
TYPE: VMC 125/SIEMENS828D

Pg. 4

Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX	DRAWNED	DATE	SIGNATURE		TITLE: SP&FEED DRIVES	203-56-006	
				CHECKED						Pg. 5
				STANDARD						
				VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED						



M4

Servo motor 4TH. AXIS

ALTERATION		DATE		SIGNATURE		INDEX		DATE		SIGNATURE	

DRAWNED
CHECKED
STANDARD
VERIFIED
APROVED

TITLE: 4th. AXIS(OPTION)

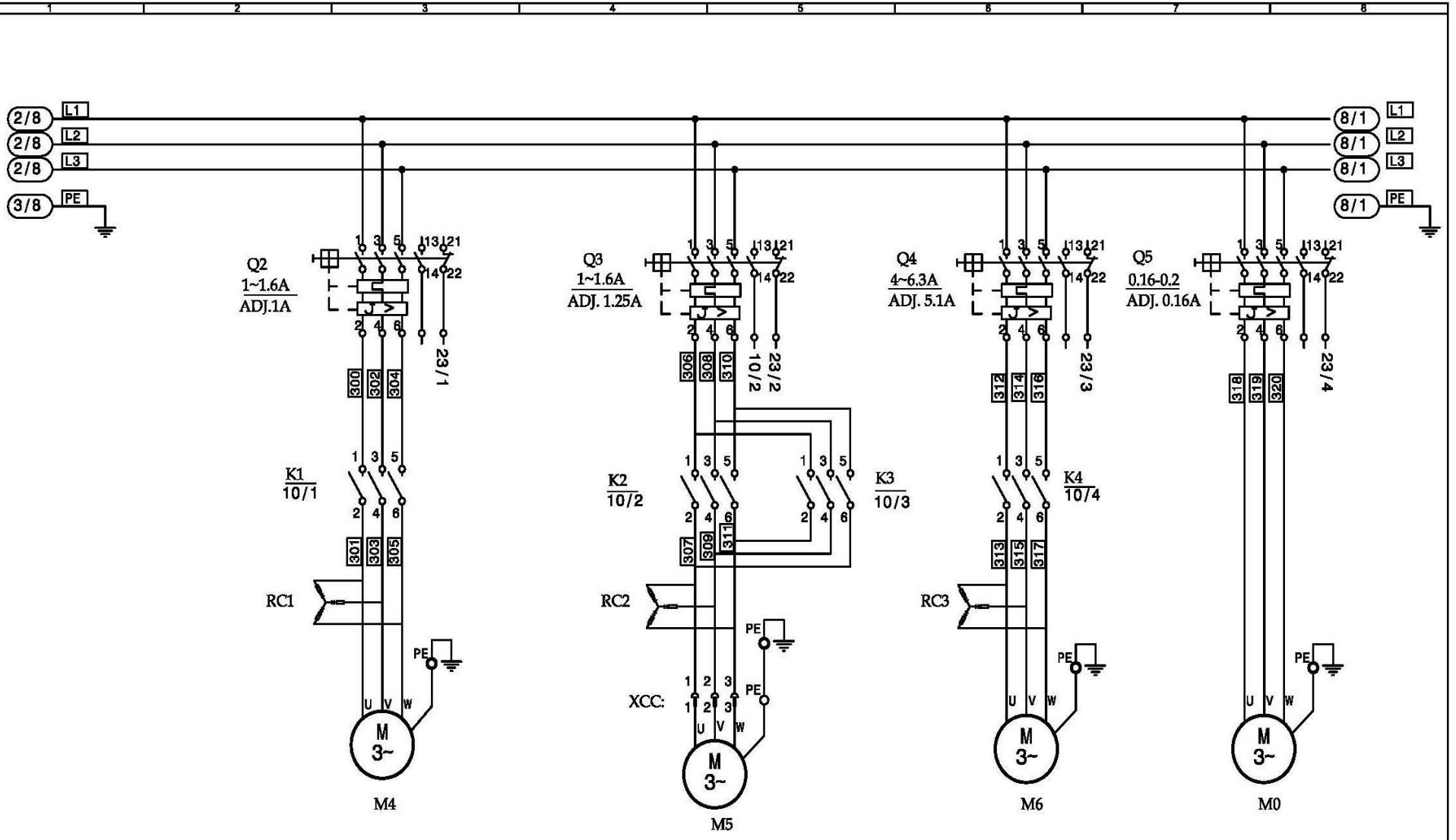
REPEATED TYPE:191,192,266

203-56-006

TYPE: VMC 125/SIEMENS828D

Pg. 6

Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: AC MOTORS

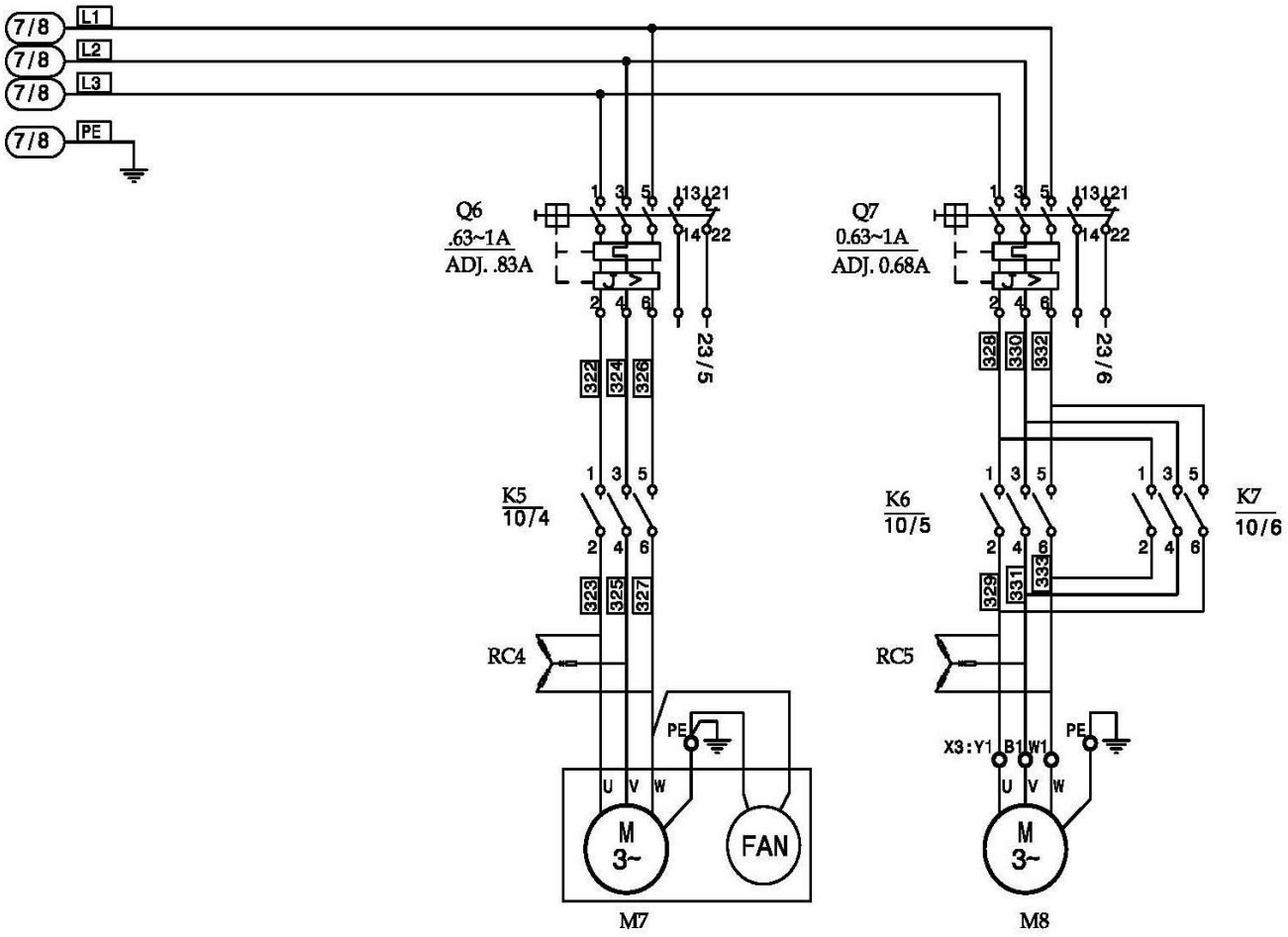
REPEATED TYPE:191,192,266

203-56-006

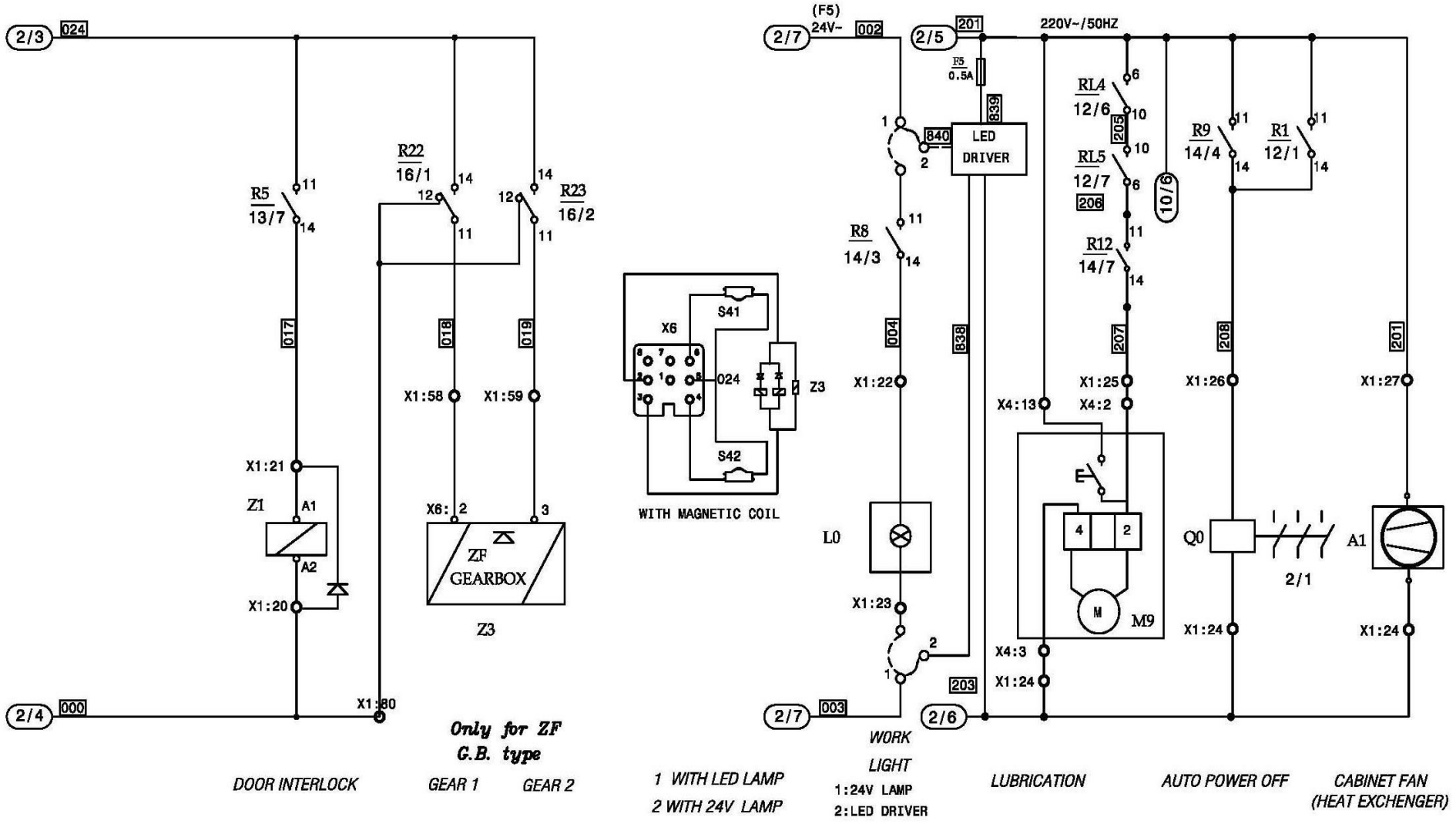
TYPE: VMC 125/SIEMENS828D

Pg. 7

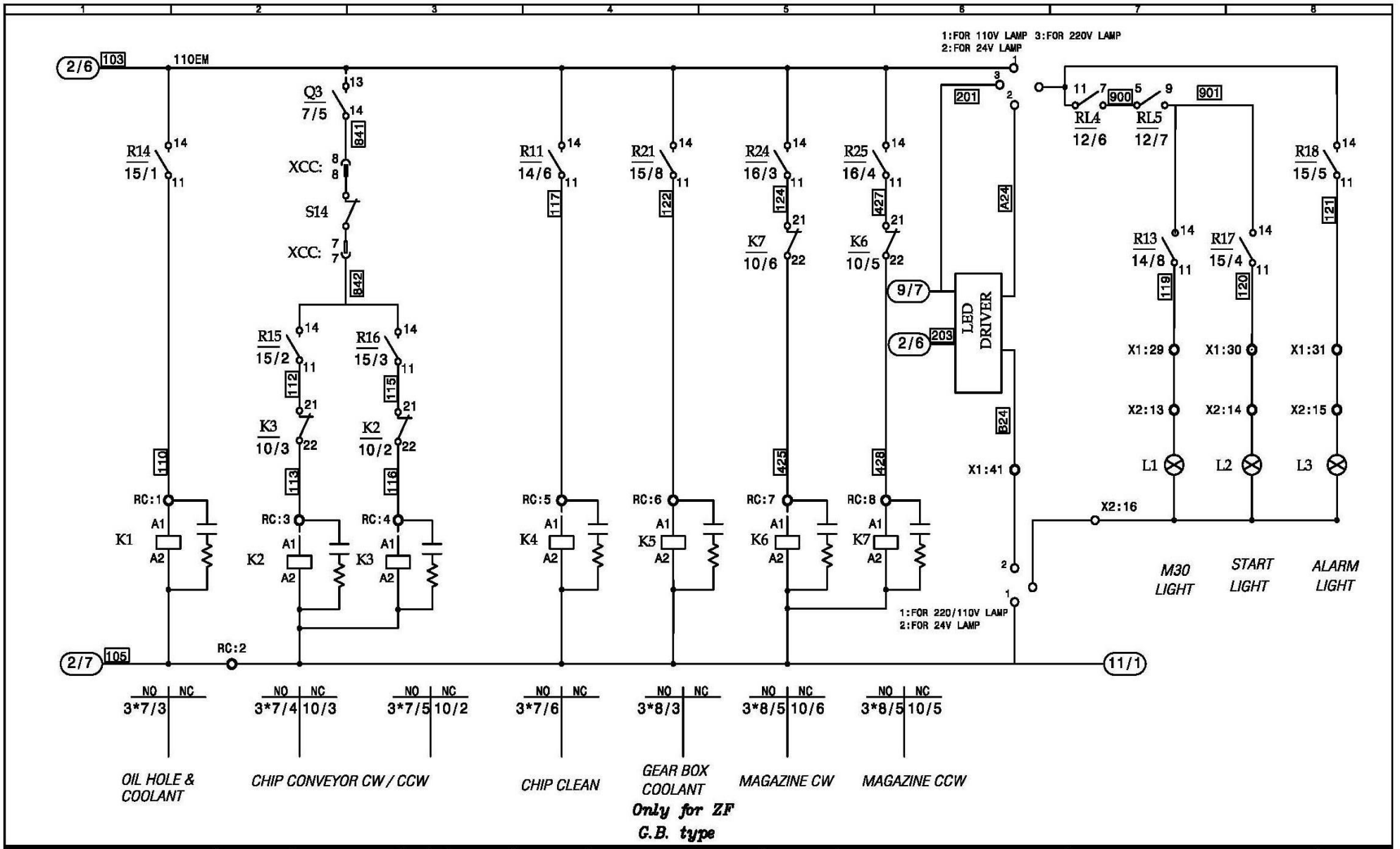
Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:		
				DRAWNED				AC MOTORS	203-56-006	
				CHECKED						Pg. 8
				STANDARD						
				VERIFIED						
				APROVED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:		
				DRAWNED				Z BRKE & MOTORS	203-56-006	Pg. 9
				CHECKED						
				STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				VERIFIED						
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: MOTORS COMMAND

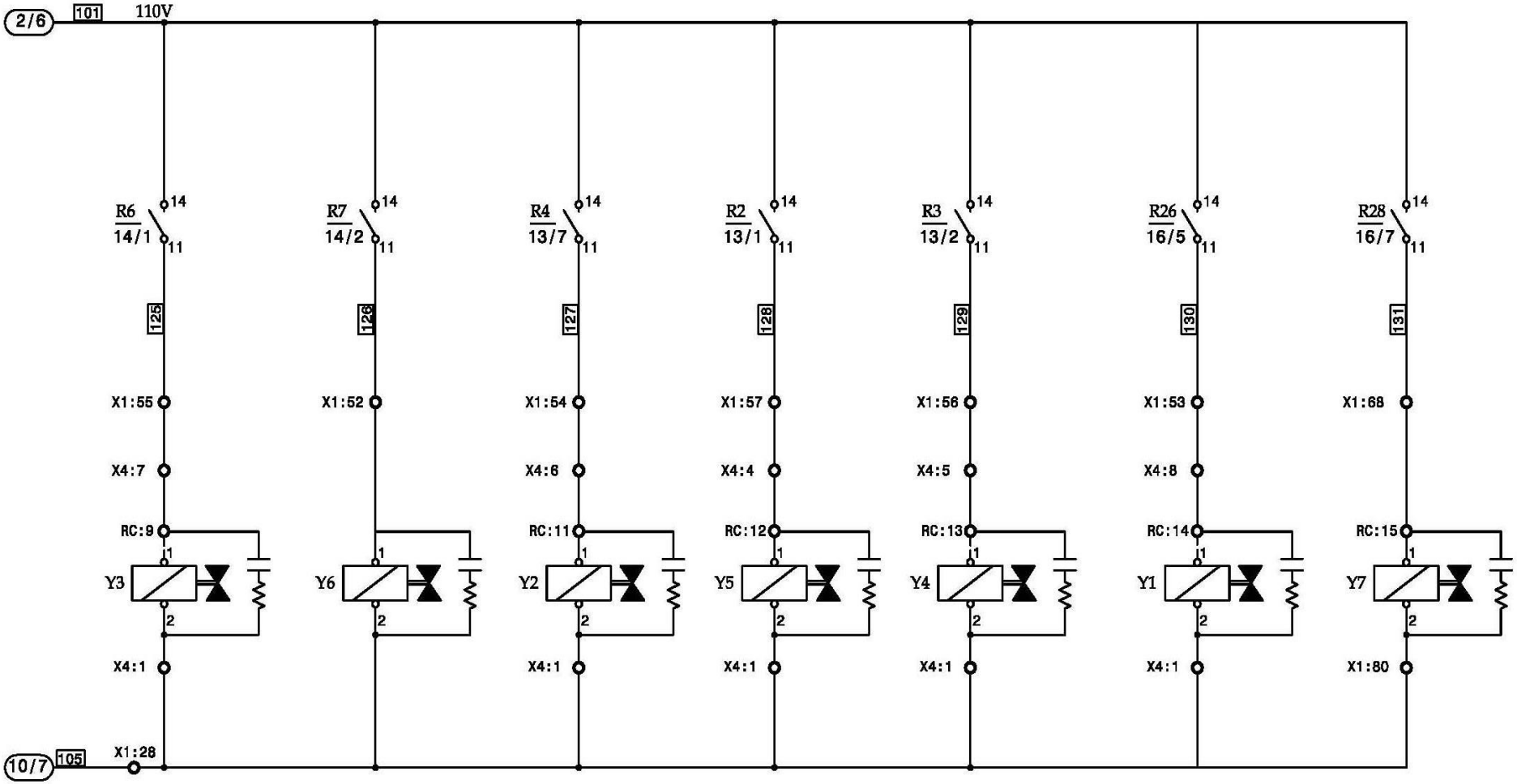
REPEATED TYPE:191,192,266

203-56-006

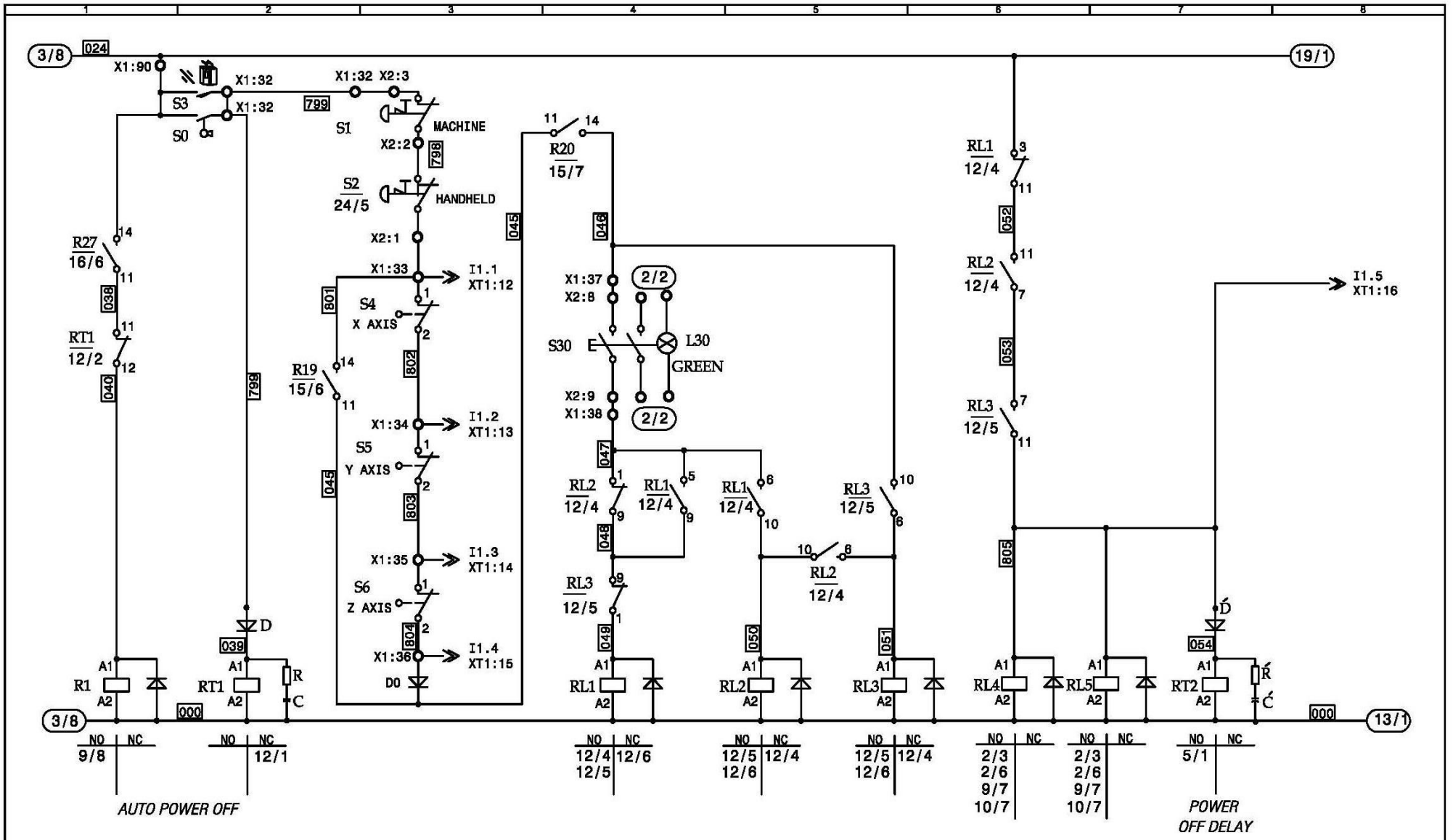
TYPE: VMC 125/SIEMENS828D

Pg. 10

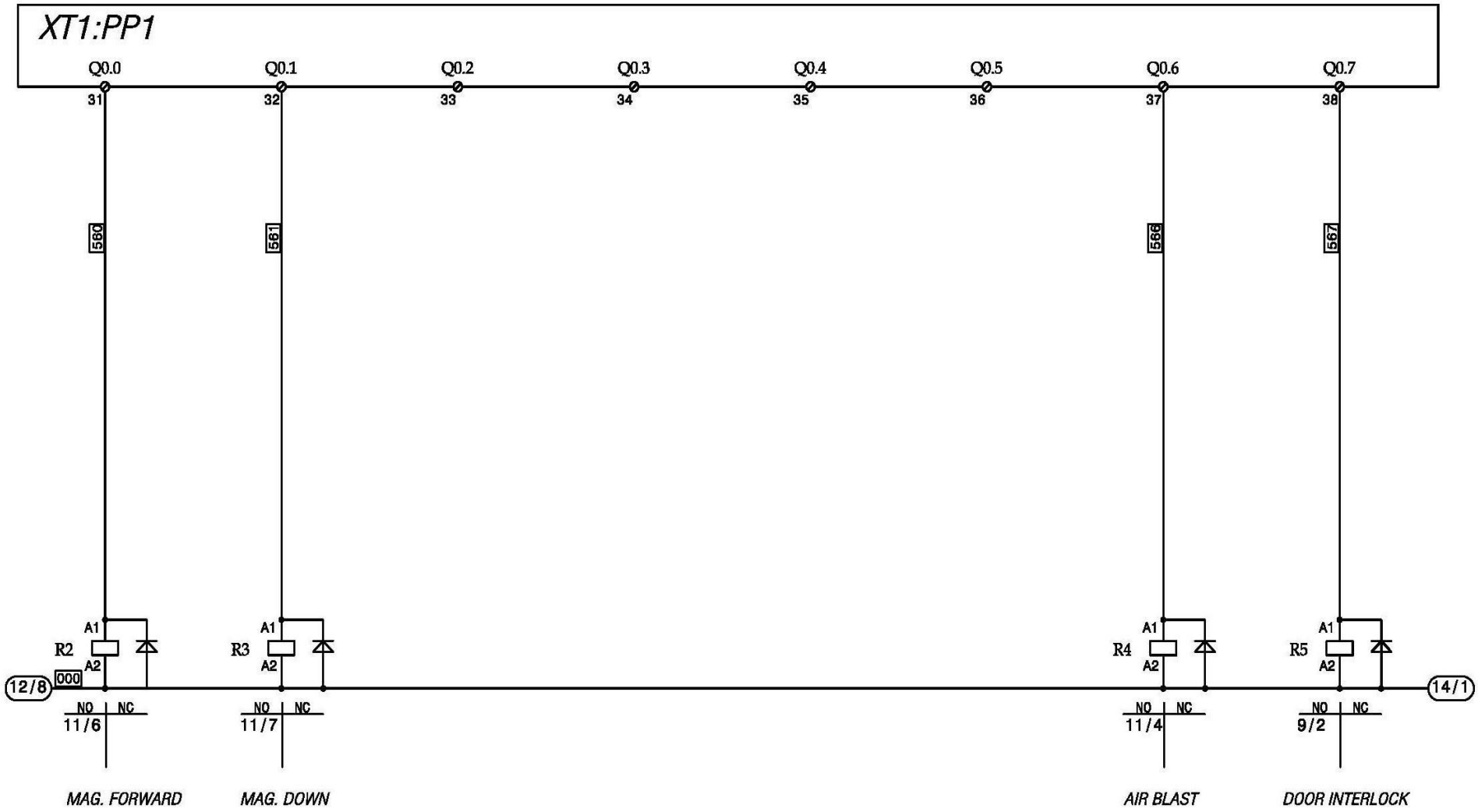
Sh.No. 38



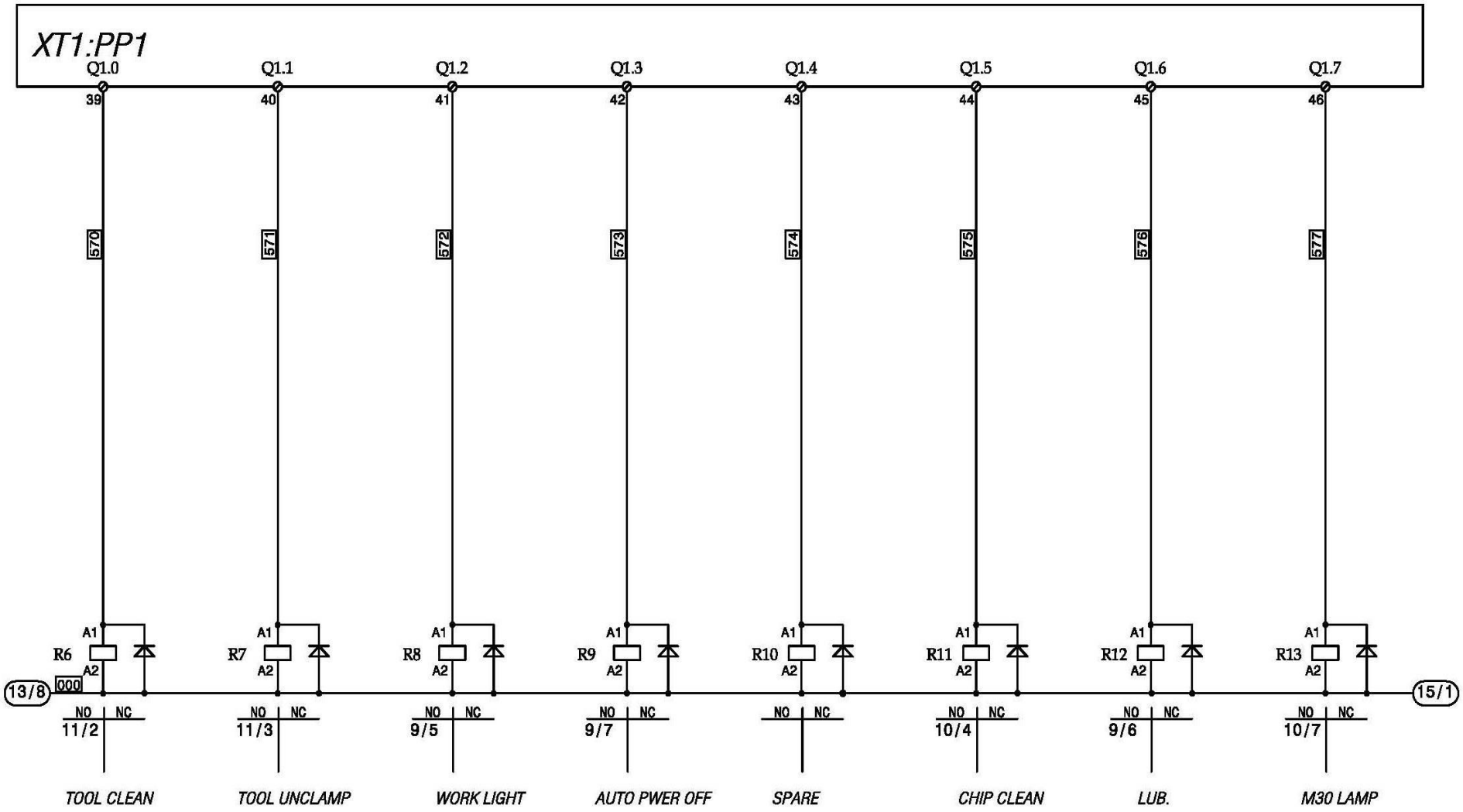
ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE	TITLE: SOL COMMAND	203-56-006	Pg. 11
				DRAWNED					
				CHECKED					
				STANDARD					
				VERIFIED					
				APROVED					
							REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE	TITLE:		
				DRAWNED			EMERGENCY	203-56-006	Pg. 12
				CHECKED					
				STANDARD					
				VERIFIED			REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED					

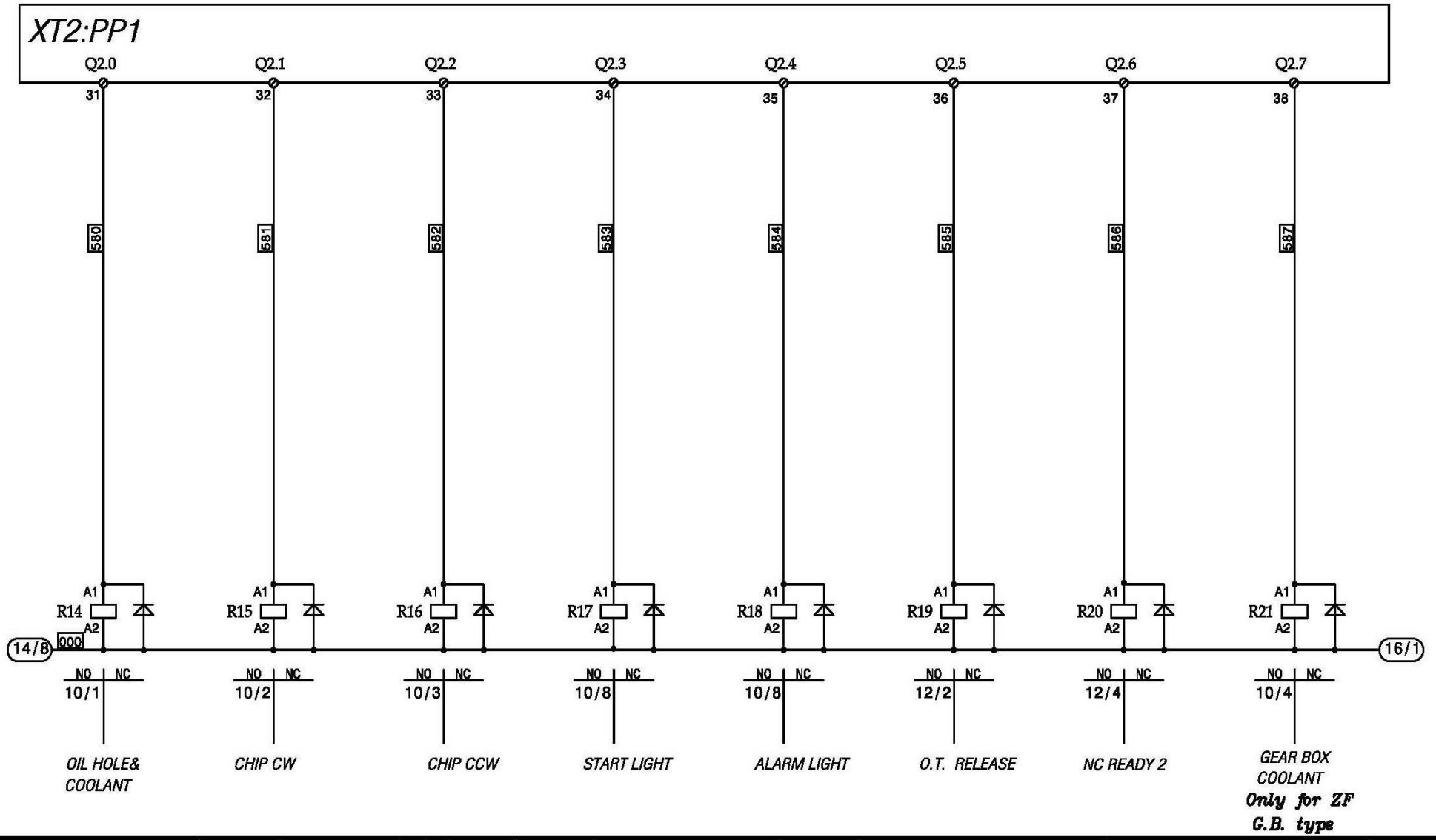


ALTERATION	DATE	SIGNATURE	INDEX	DRAWNED	DATE	SIGNATURE	TITLE: OUT PUTS	203-56-006	Pg. 13
				CHECKED					
				STANDARD					
				VERIFIED					
				APROVED			REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38



ALTERATION		DATE	SIGNATURE	INDEX		DRAWNED	DATE	SIGNATURE		TITLE: OUT PUTS	203-56-006
						CHECKED					
						STANDARD					
						VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D
						APROVED					

Pg. 14
Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: OUT PUTS

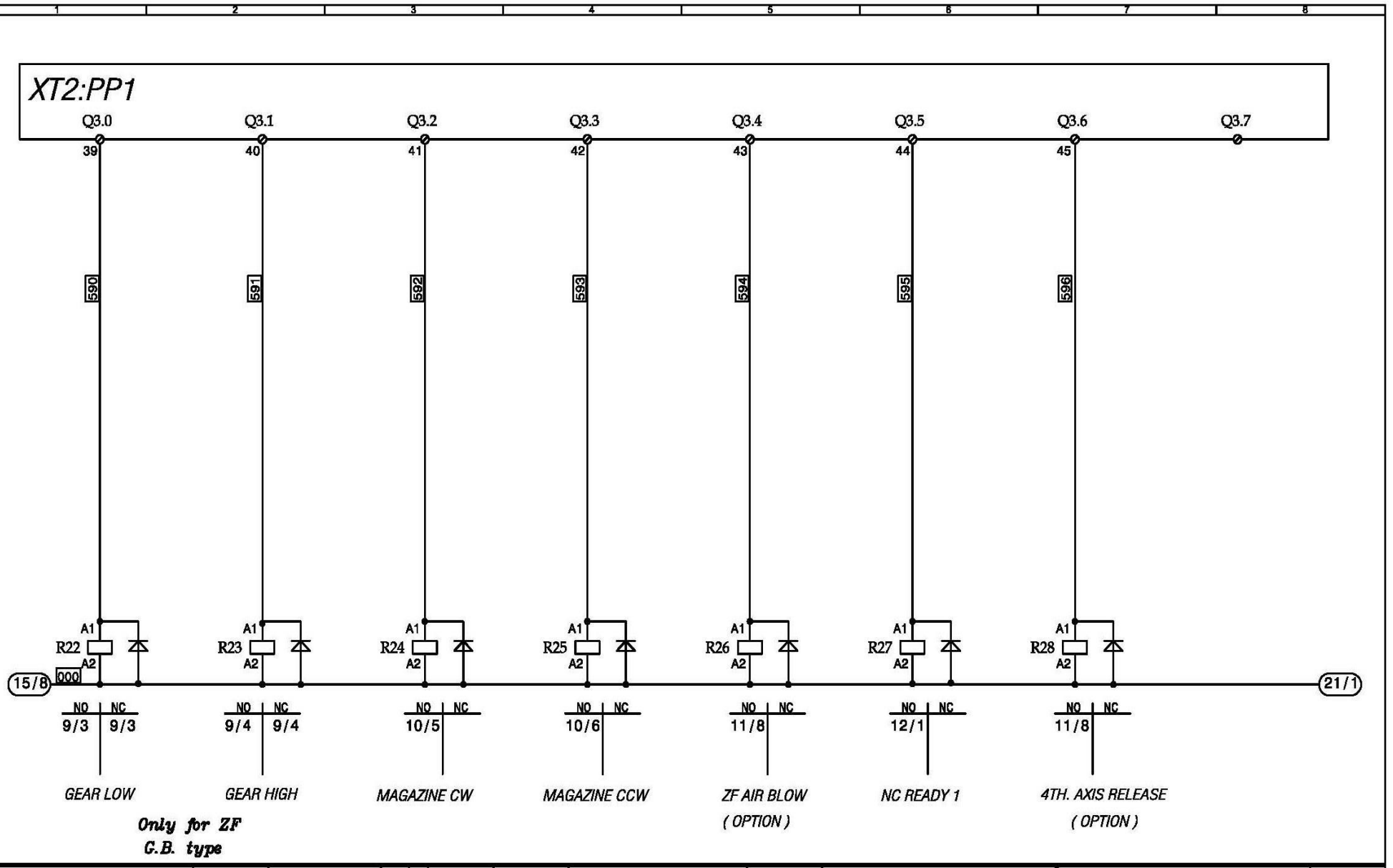
REPEATED TYPE:191,192,266

203-56-006

TYPE: VMC 125/SIEMENS828D

Pg. 15

Sh.No. 38

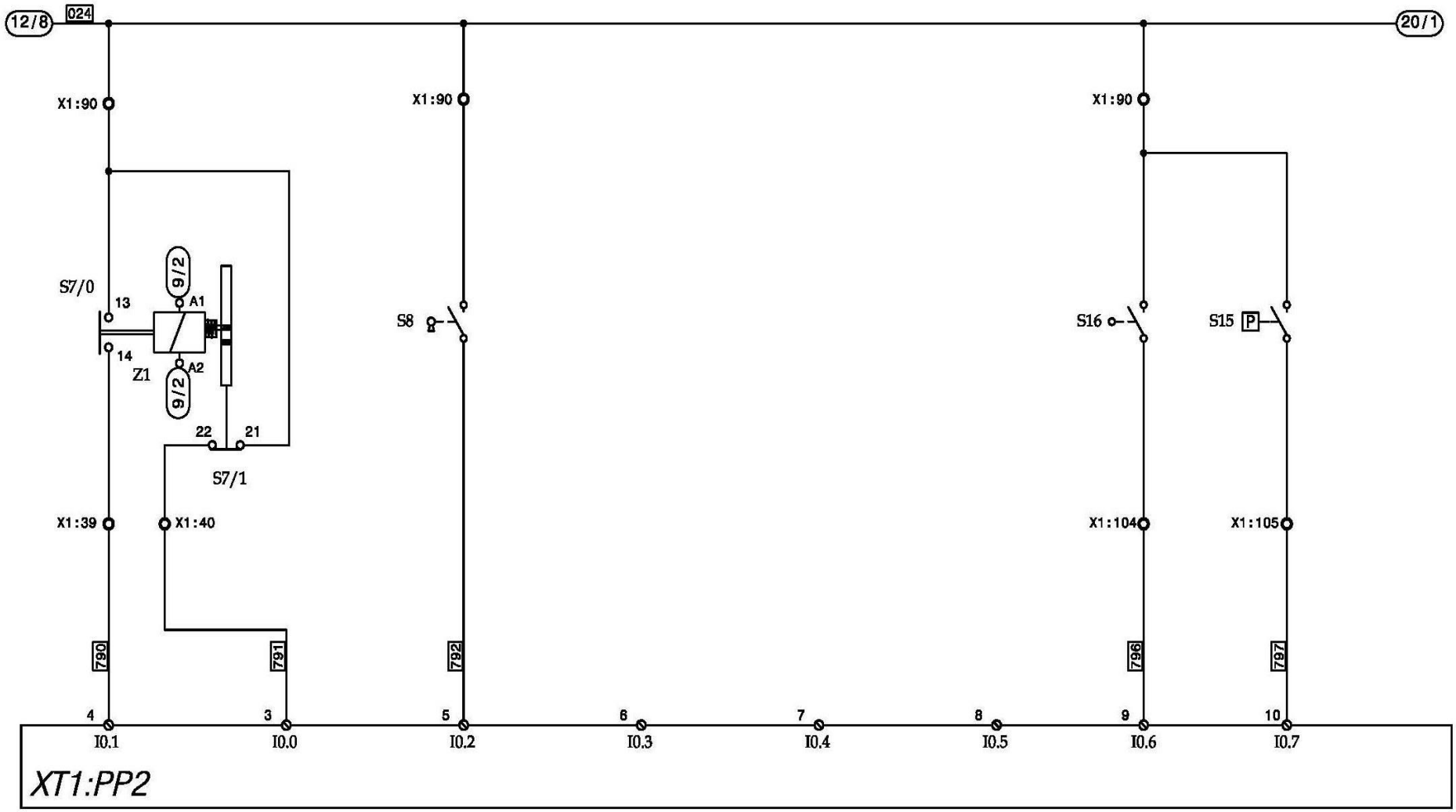


ALTERATION		DATE	SIGNATURE	INDEX		DRAWNED	DATE	SIGNATURE	TITLE: OUTPUTS	203-56-006
						CHECKED				
						STANDARD				
						VERIFIED				
						APROVED			REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D

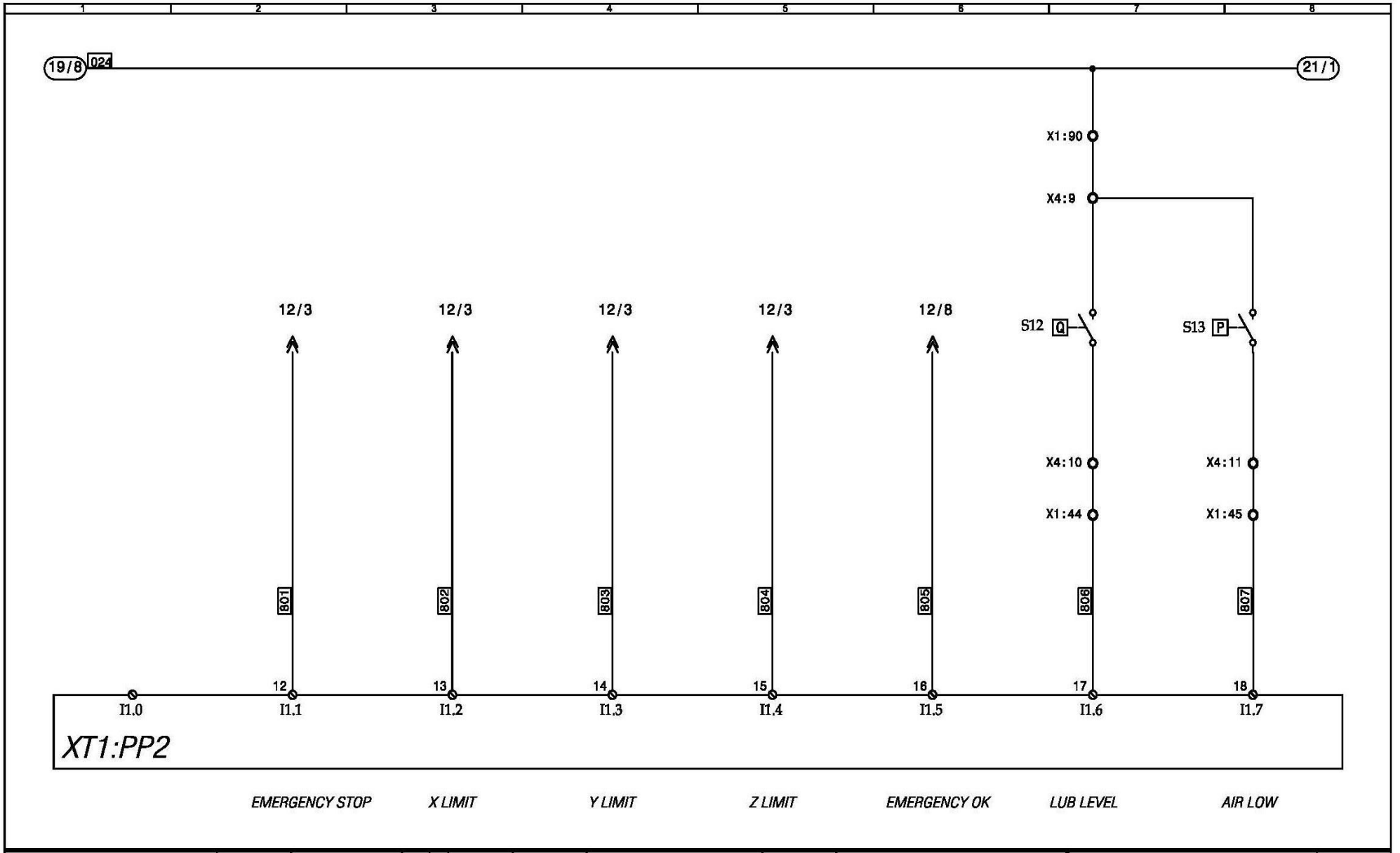
Pg. 16
Sh.No. 38

RESERVE

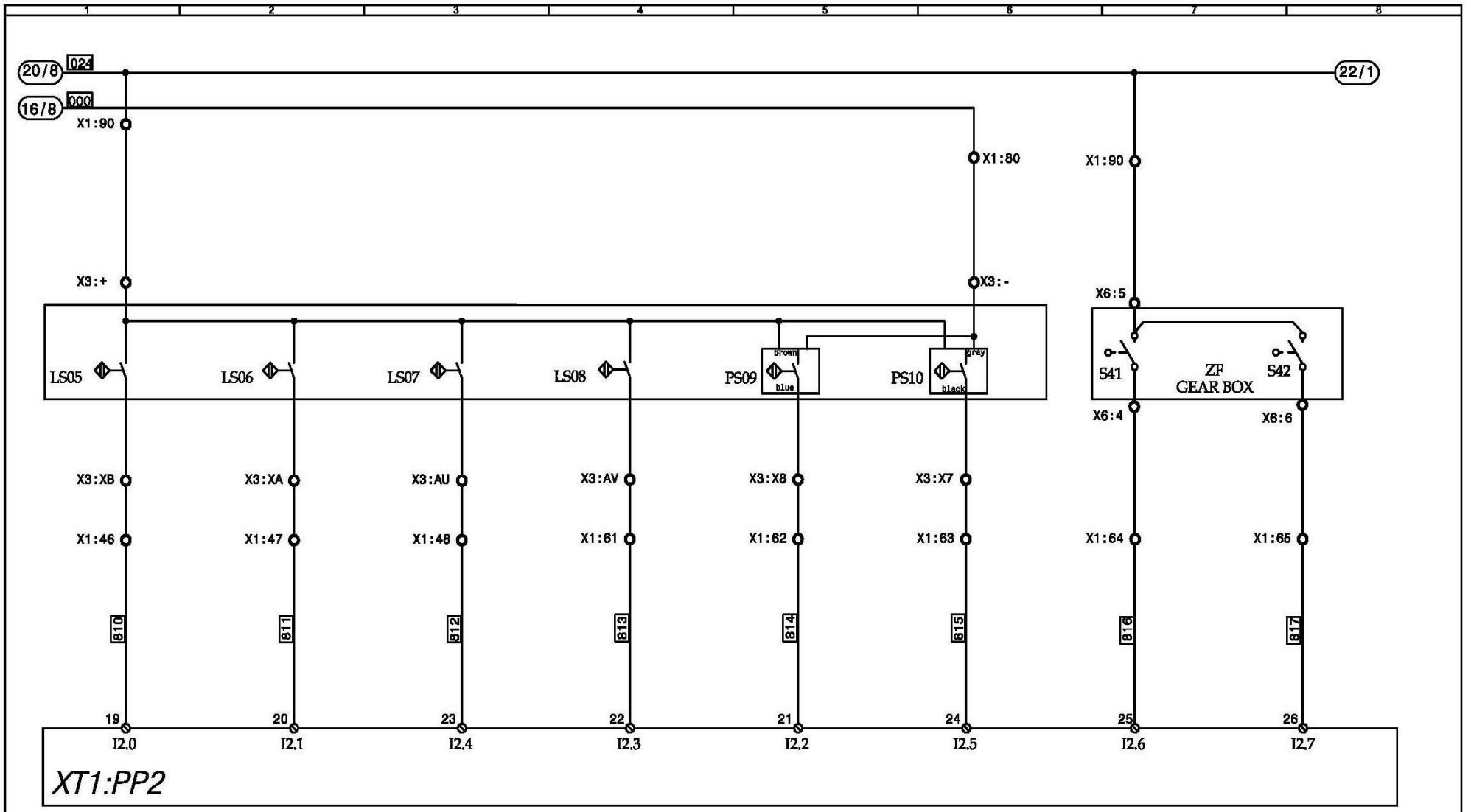
ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:	203-56-006	
				DRAWNED						
				CHECKED						Pg. 17-18
				STANDARD						
				VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:		
				DRAWNED				INPUTS	203-56-006	
				CHECKED						Pg. 19
				STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				VERIFIED						
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:		
				DRAWNED				INPUTS	203-56-006	
				CHECKED						Pg. 20
				STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				VERIFIED						
				APROVED						



MAG. FORWARD LS *MAG. BACKWARD LS* *MAG. DOWN LS* *MAG.UP LS* *COUNTER PROXY* *MAG. REF PROXY* *GEAR 1* *GEAR 2*

Only for mag. type A

Only for ZF G.B. type

ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: INPUTS

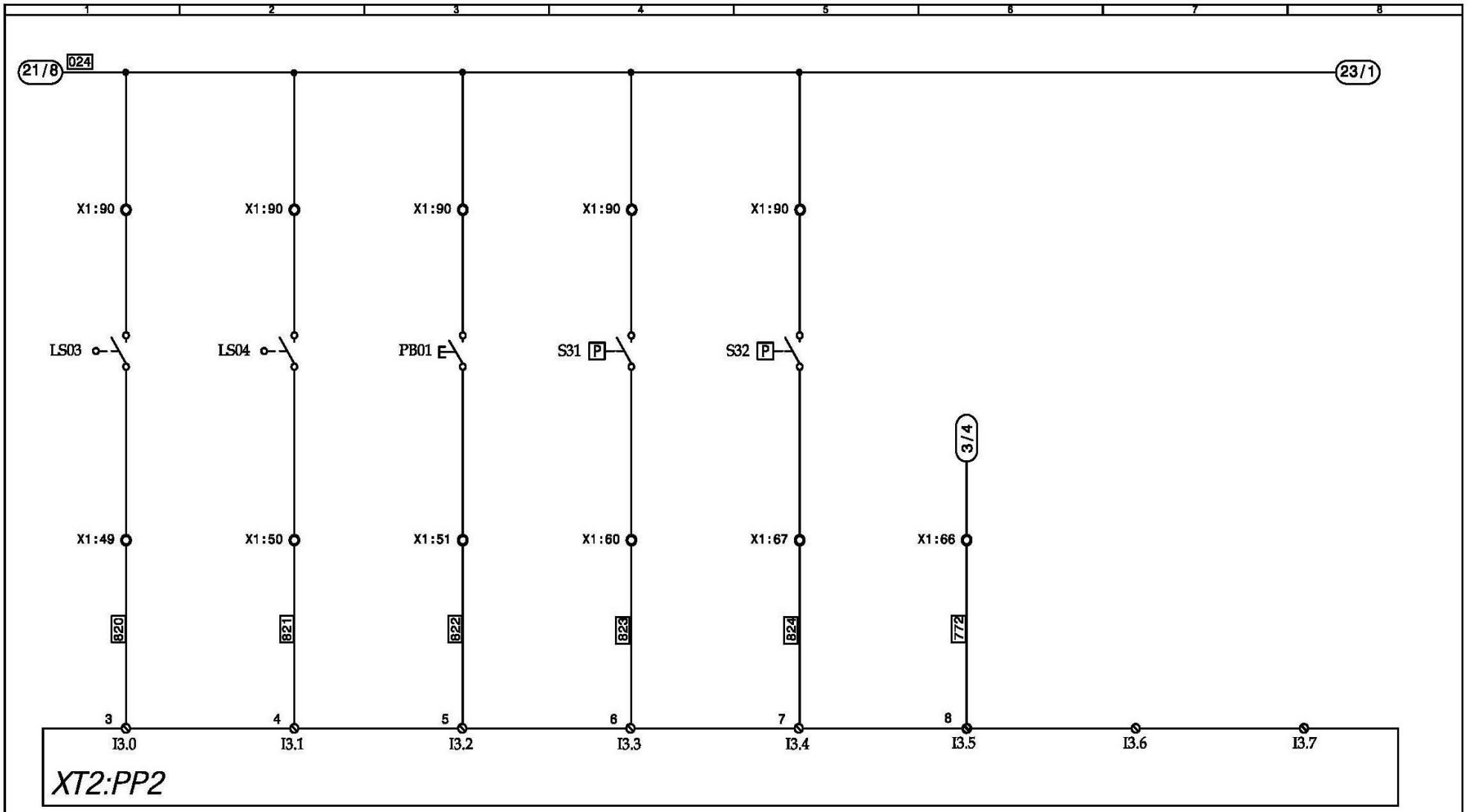
REPEATED TYPE:191,192,266

203-56-006

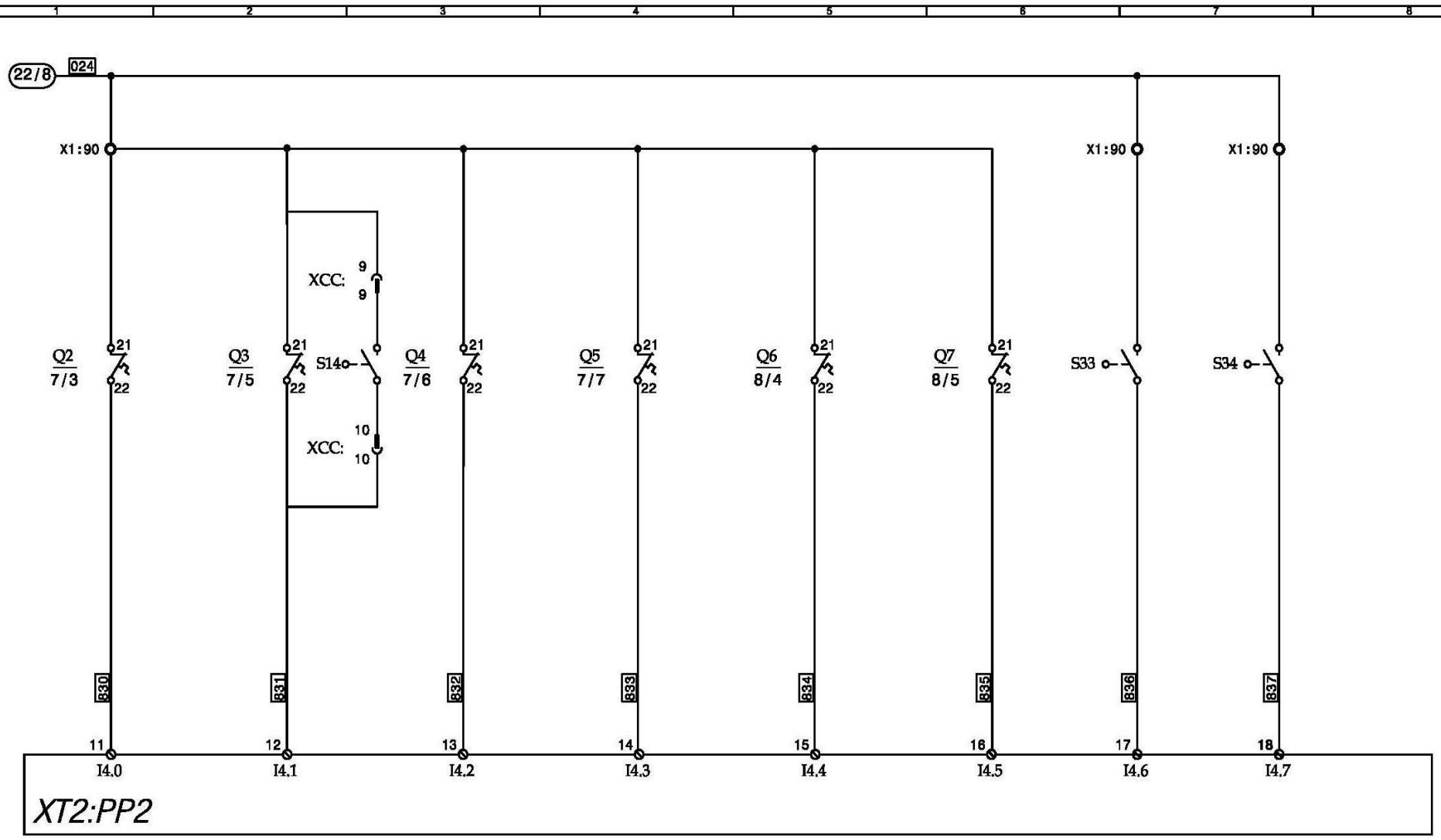
TYPE: VMC 125/SIEMENS828D

Pg. 21

Sh.No. 38



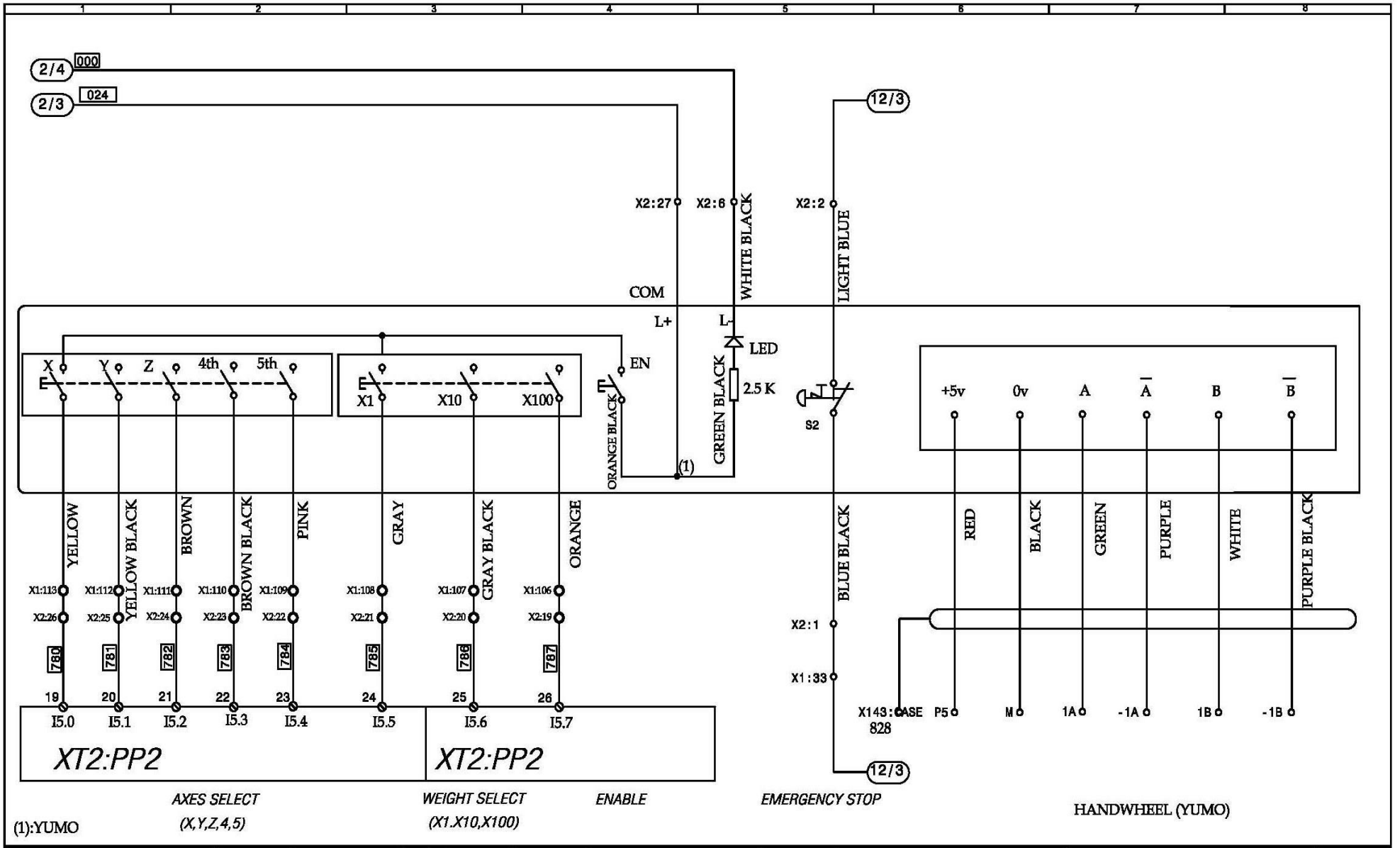
ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:		
				DRAWNED				INPUTS	203-56-006	Pg. 22
				CHECKED						
				STANDARD						
				VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE: INPUTS MOTORS OVERLOAD	203-56-006	Pg. 23
				DRAWNED						
				CHECKED						
				STANDARD						
				VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED						

RESERVE

ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:	203-56-006	
				DRAWNED						
				CHECKED						
				STANDARD						Pg. 24-25
				VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE: INPUTS HAND HELD UNIT

REPEATED TYPE:191,192,266

203-56-006

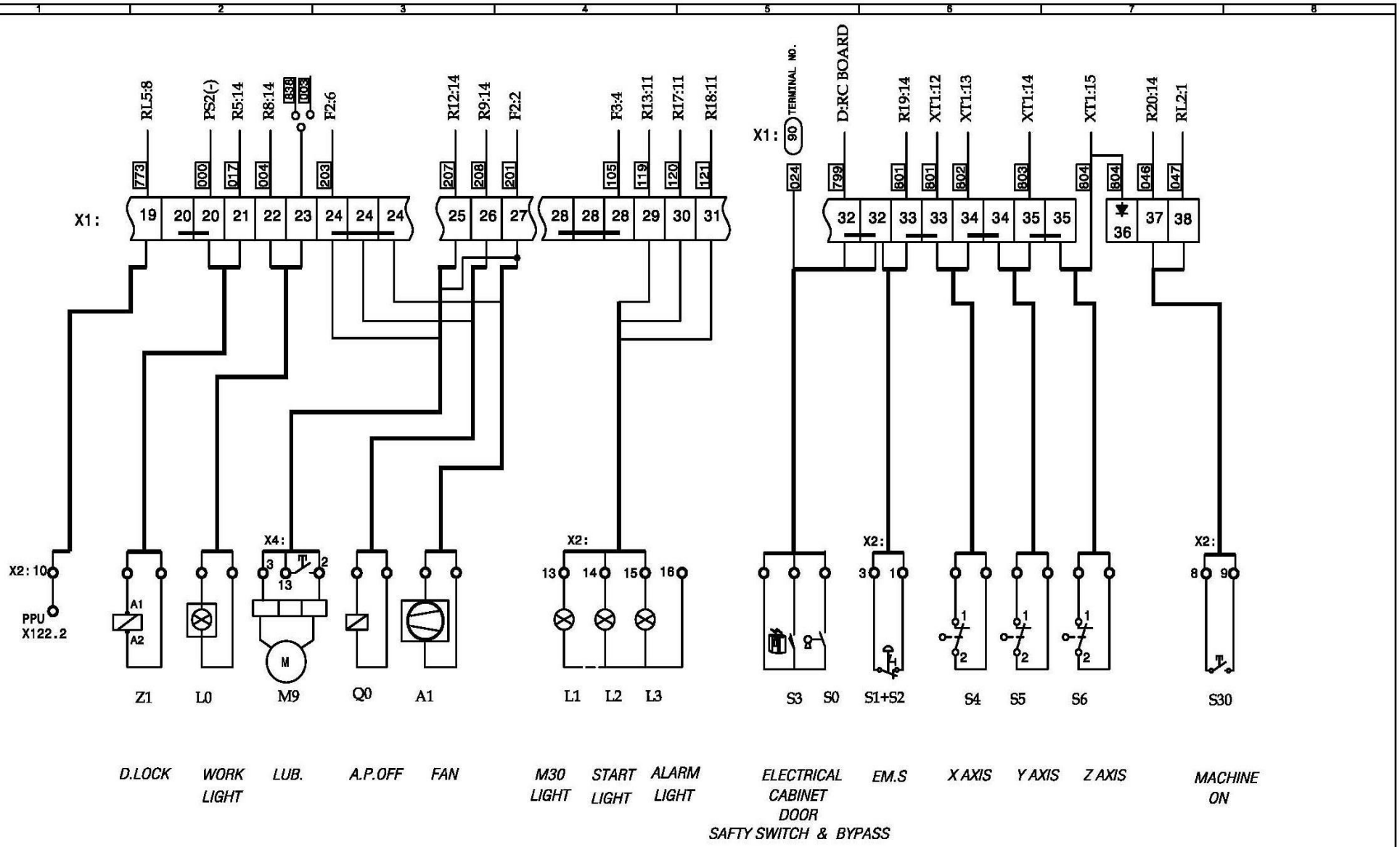
TYPE: VMC 125/SIEMENS828D

Pg. 26

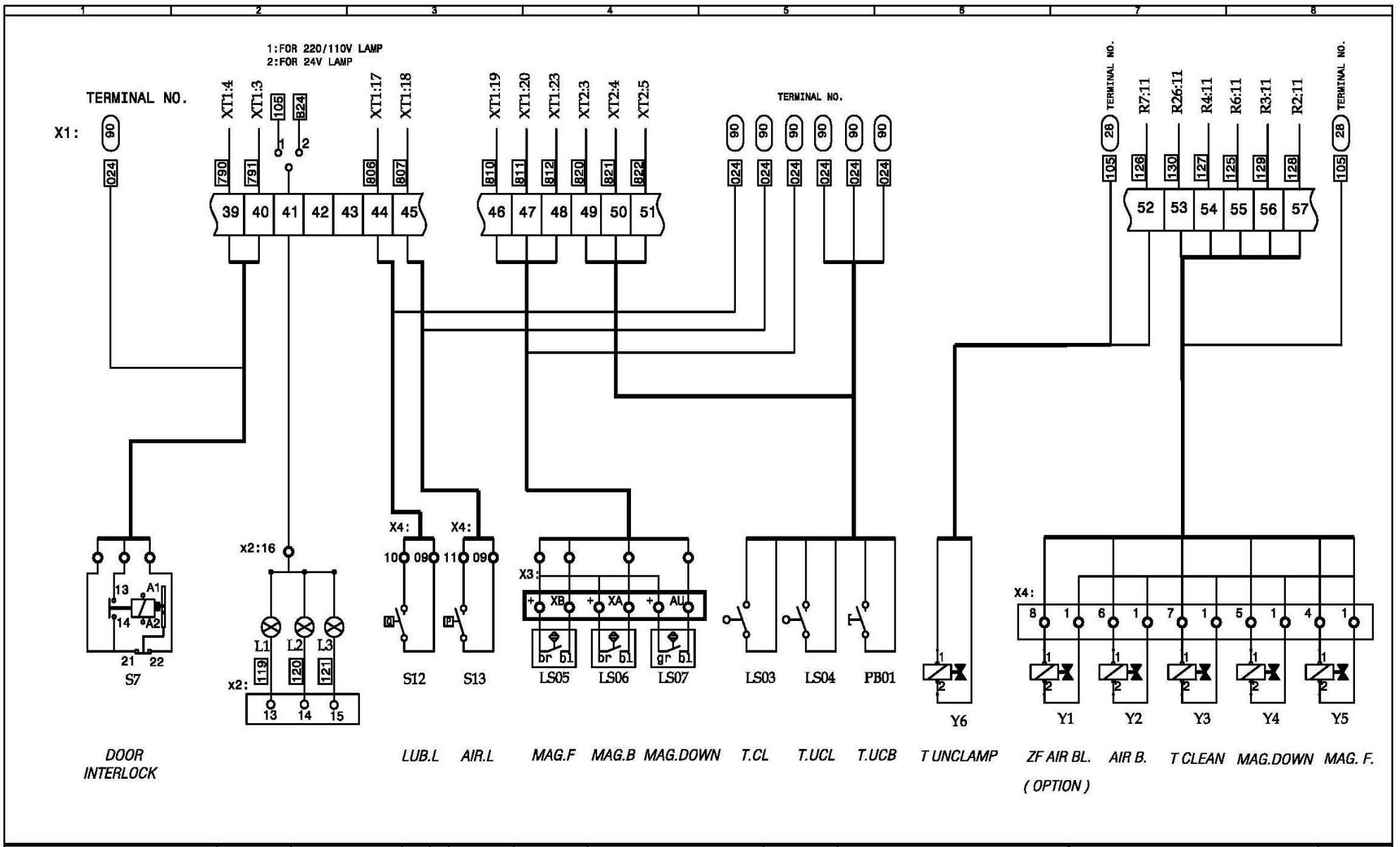
Sh.No. 38

RESERVE

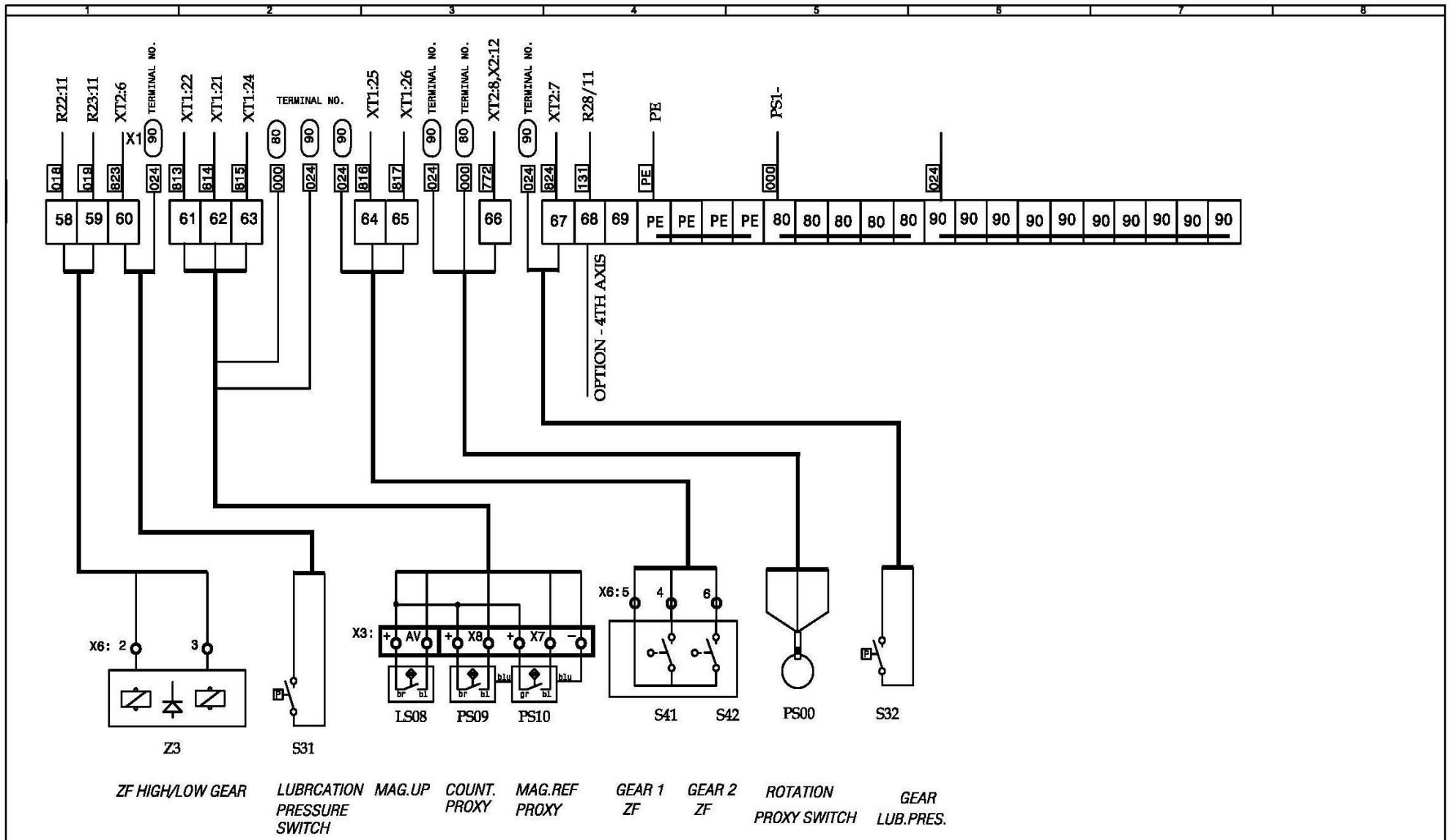
ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE		TITLE:	203-56-006	
				DRAWNED						
				CHECKED						Pg. 27
				STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
				VERIFIED						
				APROVED						



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE	TITLE:	203-56-006	
				DRAWNED			X1 TERMINAL		Pg. 28
				CHECKED					
				STANDARD					
				VERIFIED					
				APROVED			REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38

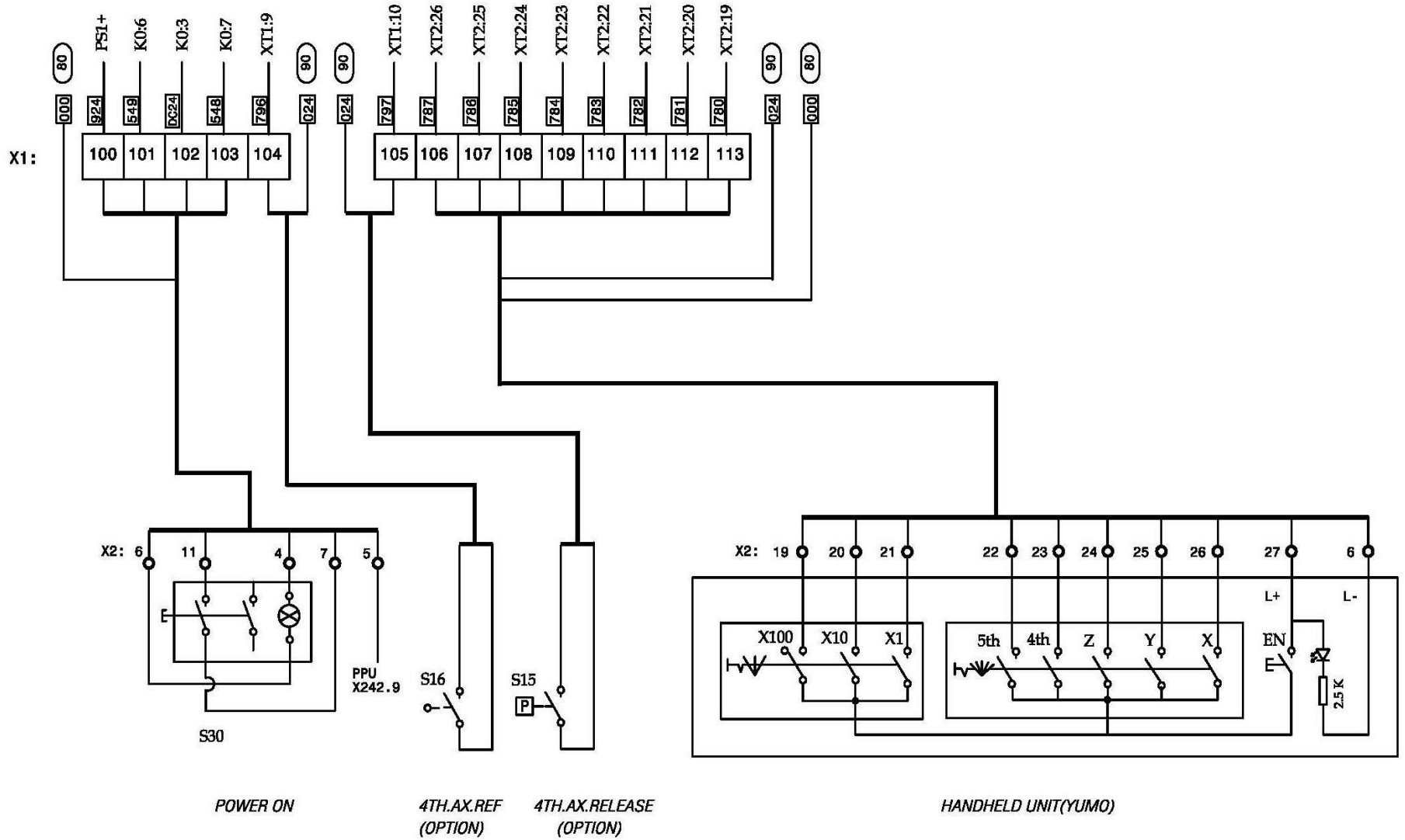


ALTERATION	DATE	SIGNATURE	INDEX		DRAWNED	DATE	SIGNATURE		TITLE: X1 TERMINAL	203-56-006	Pg. 29
					CHECKED						
					STANDARD				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
					VERIFIED						
					APROVED						

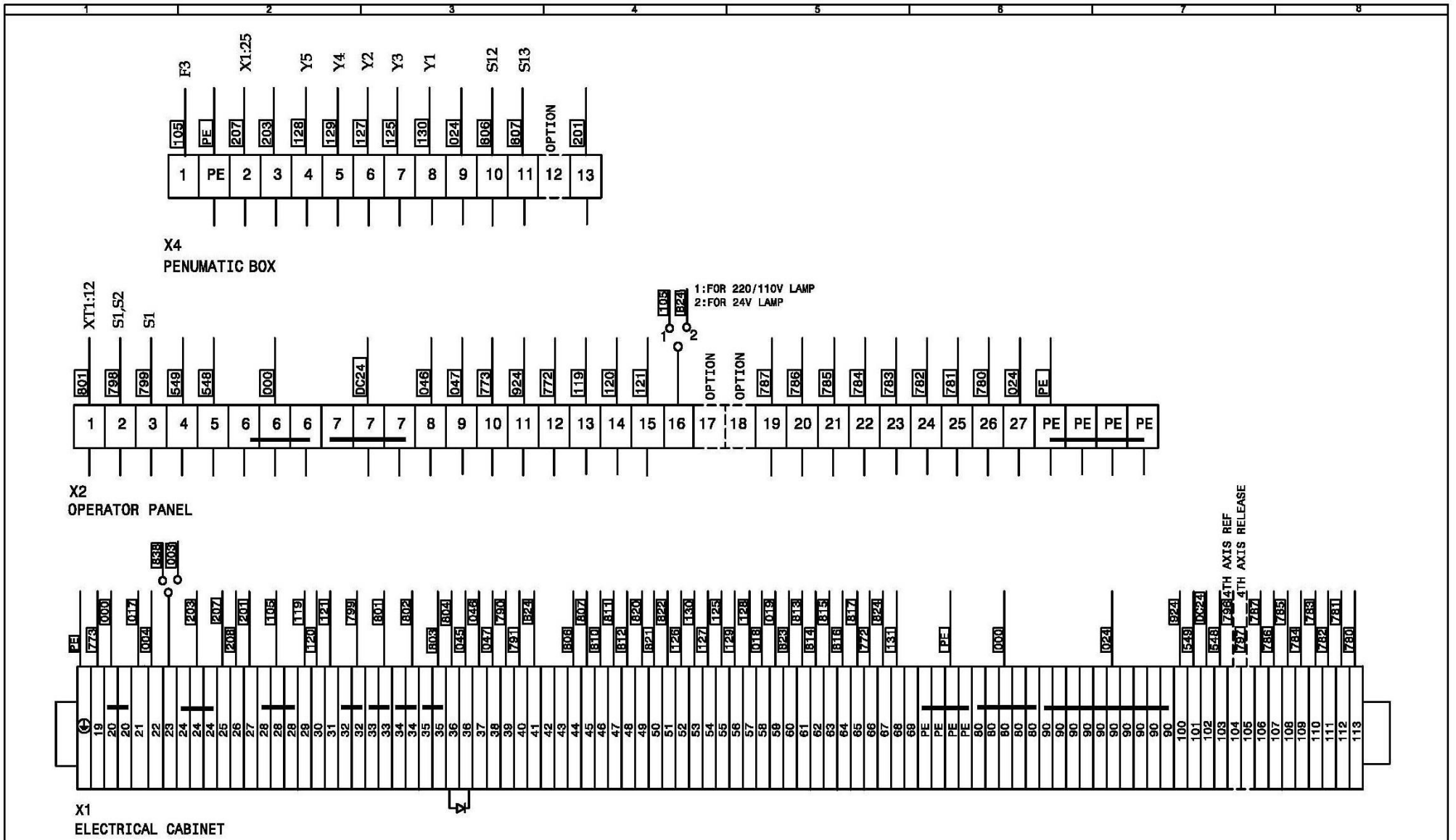


ALTERATION	DATE	SIGNATURE	INDEX	DRAWNED / CHECKED / STANDARD / VERIFIED / APROVED	DATE	SIGNATURE	TITLE: X1 TERMINAL	203-56-006
							REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D

Pg. 30
Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE	TITLE:		
				DRAWNED			X1 TERMINAL	203-56-006	
				CHECKED					Pg. 31
				STANDARD					
				VERIFIED					
				APROVED			REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38



ALTERATION		DATE		SIGNATURE		INDEX		DATE		SIGNATURE
							DRAWNED			
							CHECKED			
							STANDARD			
							VERIFIED			
							APROVED			

TITLE:

X1,X2,X4. TERMINALS

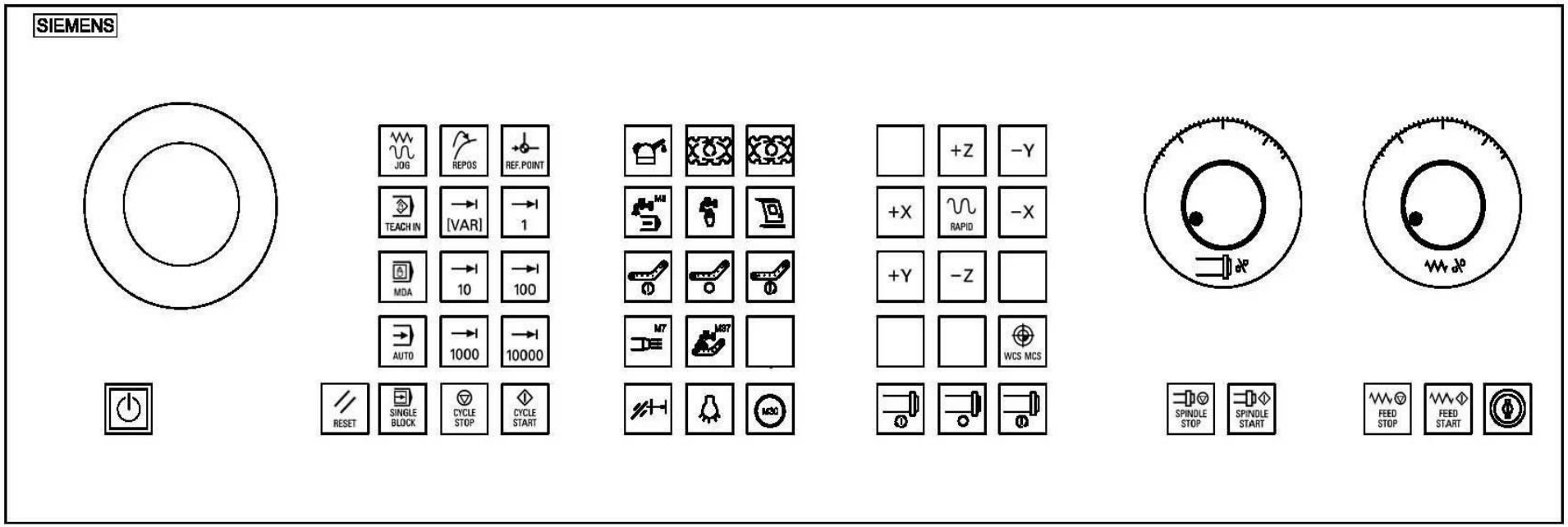
REPEATED TYPE:191,192,266

203-56-006

TYPE: VMC 125/SIEMENS828D

Pg. 32

Sh.No. 38



ALTERATION	DATE	SIGNATURE	INDEX		DRAWNED	DATE	SIGNATURE		TITLE: MCP LABEL	203-56-006	Pg. 33
					CHECKED						
					STANDARD						
					VERIFIED				REPEATED TYPE:191,192,266	TYPE: VMC 125/SIEMENS828D	Sh.No. 38
					APROVED						

RESERVE

ALTERATION	DATE	SIGNATURE	INDEX		DATE	SIGNATURE
				DRAWNED		
				CHECKED		
				STANDARD		
				VERIFIED		
				APROVED		

TITLE:

REPEATED TYPE:191,192,266

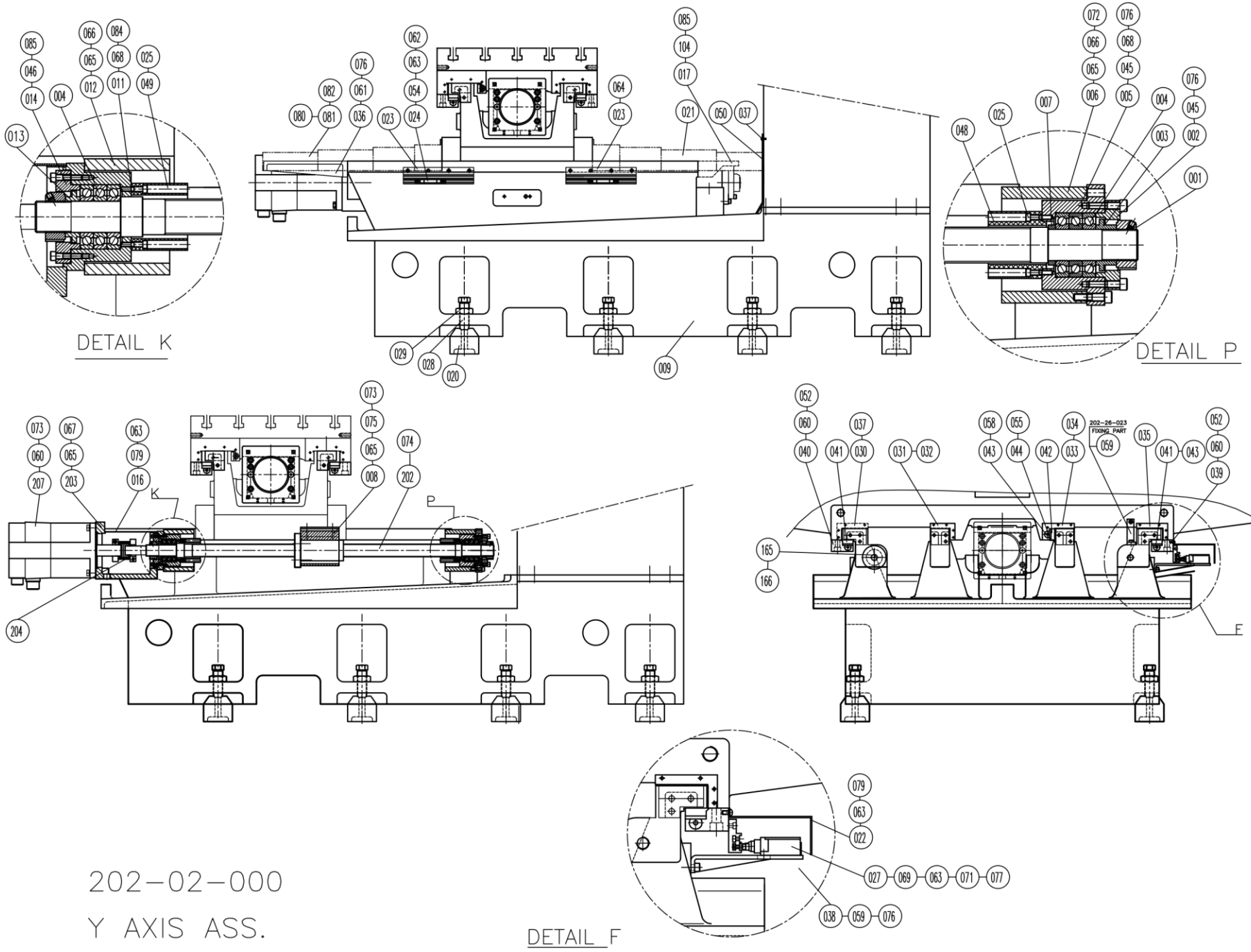
203-56-006

TYPE: VMC 125/SIEMENS828D

Pg. 34-38

Sh.No. 38

VI. PART LIST

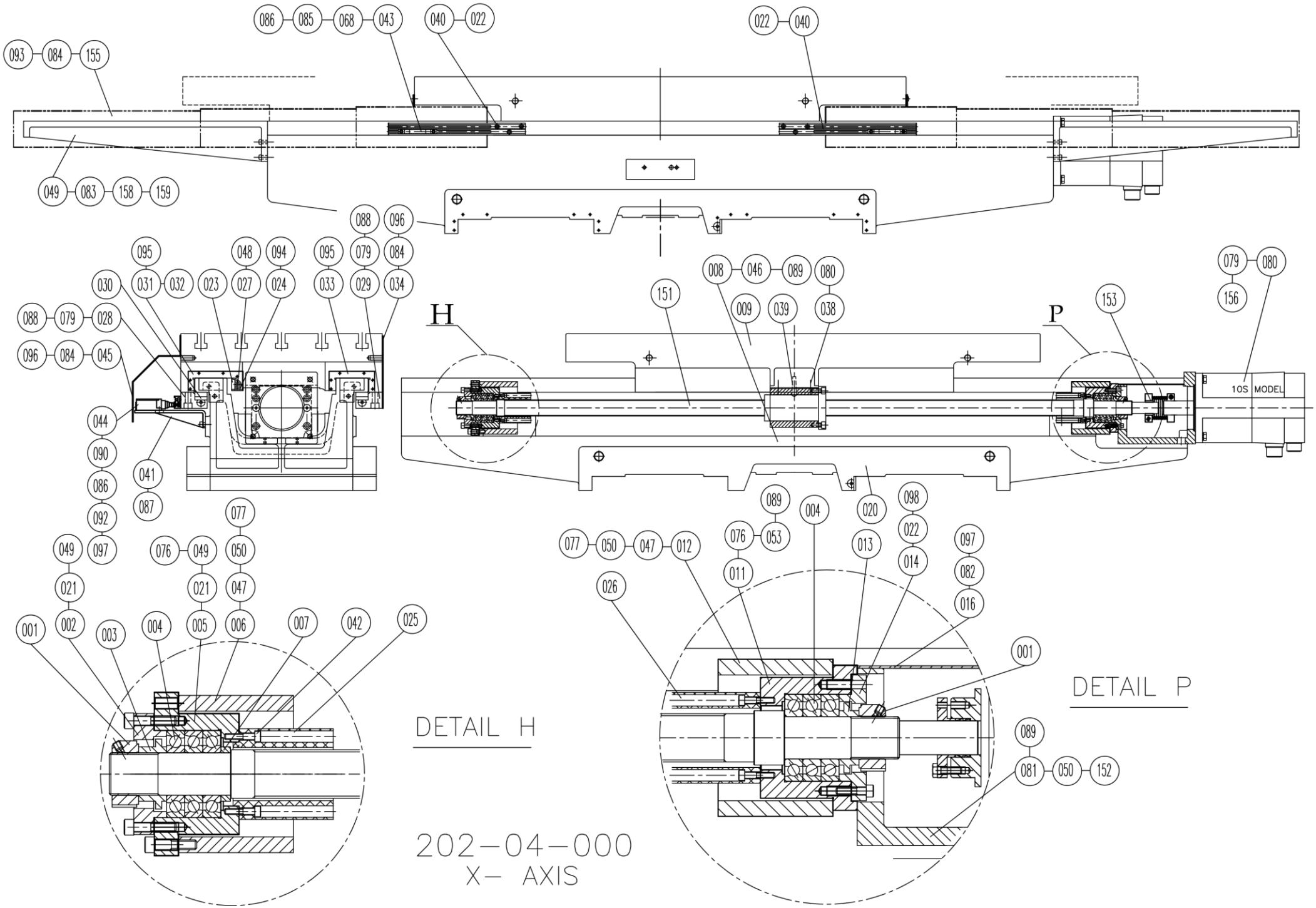


202-02-000

Y AXIS ASS.

	203-02-000	PART LIST : Y AXIS
Position	**Drawing No.**	**Title Dimension**
001		LOCKING NUT YSF M35x1.5
002	20202002	SHAFT COVER
003	20202003	COLLAR
004		BALL BEARING BSB 3572-2Z-SU
005	20202005	BEARING SEAT
006	20202006	BEARING SUPPORT SEAT
007	20202007	COLLAR
008	20202008	NUT BRACET
009	20202009	BASE
011	20202011	BEARING SEAT
012	20202012	BEARING SUPPORT SEAT
013	20202013	COLLAR
014	20202014	BEARING CAP
016	20202016	MOTOR BRACKET COVER
017	20202017	TELESCOPIC COVER BRACKET
020	20202020	MACHINE LEG SEAT
021	20202021	TELESCOPE COVER ASS.
022	20202022	COVER PLATE
023	20202023	TOUCH BLOCK ADJUSTING PLATE
024	20206035	LIMIT TOUCH BLOCK
025		SCREW M5x25-12.9
026		TURCITE B FLAT 1.2
027		LIMIT SWITCH XCK-M102
028	20202028	ANCHOR BOLT
029		NUT B M30XP2-11H
030	20202030	WIPER
031	20202031	WIPER
032	20202032	WIPER
033	20202033	WIPER
034	20202034	WIPER
035	20202035	WIPER
036	20202036	TELESCOPIC COVER BRACKET
037		SCREW M5X12
038	20202038	LIMIT SWITCH SEAT
039	20202039	RIGHT RETAINER PLATE
040	20202040	LEFT RETAINER PLATE
041	20202041	TAPER GIB
042	20202042	TAPER GIB
043	20202043	ADJUSTING SCREW
044	20202044	SHIM
045		SCREW M8X35-12.9
046		SCREW M6X25-12.9
047		TURCITE B FLAT 1.2
048	20202048	TOUCH BLOCK
049	20202049	TOUCH BLOCK
050	20202050	STRIPPER

Position	Drawing No.	Title Dimension
051	16001083	PATH LOCKING
052		O RING 13x2
054	20206063	LIMIT TOUCH BLOCK
055		SCREW M4X8
058	20202058	ADJUSTING SCREW
059		SCREW M8X25-12.9
060		SCREW M12x45-12.9
061		SCREW M8X30-12.9
062		SCREW M5X14-12.9
063		WASHER B 5.3- 140HV
064		SCREW M6x20-12.9
065		PIN A10X50-St
066		SCREW M14X60-12.9
067		SCREW M10x65-12.9
068		PIN A8x40-St
069		SCREW M5X30-12.9
071		NUT M5-6-St
072		SPRING WASHER B14-FST
073		SPRING WASER B12-FST
074		SCREW M10X35-12.9
075		SCREW M12X55-12.9
076		SPRING WASHER B8-FST
077		SPRING WASHER B5- FST
079		SCREW M5X10
080	20202080	TELESCOPIC COVER ASS.
081		SCREW M6X12
082		WASHER B6.4-140HV
083		SPRING WASHER B10-FST
084		SCREW M10X30-12.9
085		SPRING WASHER B6- FST
086		GREASE ISOFLEXNBU15
104		SCREW M6X14-12.9
165	20202165	EYE BOLT
166		SCREW M24x75-12.9
202	20302202	BALL SCREW AND NUT
203	20302203	MOTOR BASE SEAT
204		COUPLING BKL 60/38/28
207		MOTOR 1FK7101-2AC71-1RG1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022 040
093 084 155
049 083 158 159
088 096
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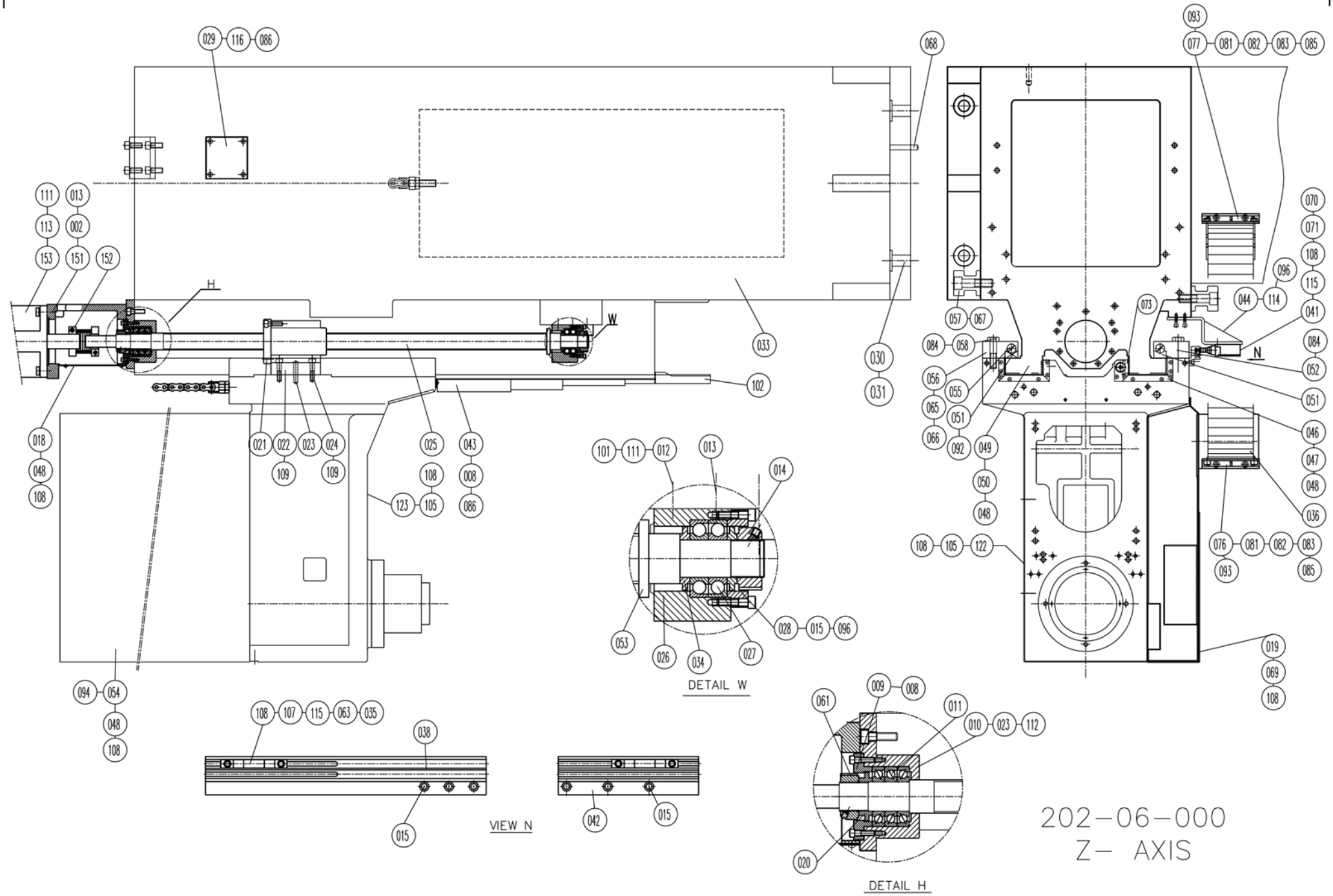
048 094 023 027 024
095 079 084 033 029 034
008 046 089 080 009 039 038 151
H
P
153
079 080 156
10S MODEL
077 050 047 012 026
089 076 053 011
004
020
098 022 014
013
097 082 016
001
089 081 050 152
077 050 076 049 021 002 001 003 004 005 006 007 042 025
DETAIL H
DETAIL P
202-04-000
X- AXIS

	203-04-000	PART LIST : X AXIS
Position	**Drawing No.**	**Title Dimension**
001		LOCKING NUT YSF M35x1.5
002	20202002	SHAFT COVER
003	20202003	COLLAR
004		BALL BEARING BSB 3572-2Z-SU
005	20202005	BEARING SEAT
006	20202006	BEARING SUPPORT SEAT
007	20202007	COLLAR
008	20204008	NUT BRACKET
009	20204009	TABLE
011	20202011	BEARING SEAT
012	20202012	BEARING SUPPORT SEAT
013	20202013	COLLAR
014	20202014	BEARING CAP
016	20202016	MOTOR BRACKET COVER
020	20204020	SADDLE
021		SCREW M8X35-12.9
022		SCREW M6X25-12.9
023	20204023	TAPER GIB
024	20202044	SHIM
025	20204025	TOUCH BLOCK
026	20202049	TOUCH BLOCK
027	20202043	ADJUSTING SCREW
028	20204028	LEFT RETAINING PLATE
029	20204029	RIGHT RETAINING PLATE
030	20204030	TAPER GIB
031	20204031	WIPER
032	20204032	WIPER
033	20204033	WIPER
034	20204034	COVER PLATE
038		SCREW M12X65-12.9
039		PIN A8x45-St
040	20204040	TOUCH BLOCK ADJUSTING PLATE
041	20204041	LIMIT SWITCH SEAT
042		SCREW M5x25-12.9
043	20206035	LIMIT TOUCH BLOCK
044		LIMIT SWITCH XCK-M102
045	20204045	PROTECTION COVER
046		SCREW M10X35-12.9
047		SCREW M14X60-12.9
048	20202058	ADJUSTING SCREW
049		SPRING WASHER B8-FST
050		PIN A10X50-St
052		TURCITE B FLAT 1.2

Position	Drawing No.	Title Dimension
053		SCREW M10X30-12.9
056	BUSAK&LUYKEN	TURCITE B FLAT 1.2
057	BUSAK&LUYKEN	TURCITE B FLAT 1.2
060	BUSAK&LUYKEN	TURCITE B FLAT 1.2
068	20206063	LIMIT TOUCH BLOCK
069	BUSAK&LUYKEN	TURCITE B FLAT 1.2
070	BUSAK&LUYKEN	TURCITE B FLAT 1.2
071	BUSAK&LUYKEN	TURCITE B FLAT 1.2
076		PIN A8x40-St
077		SPRING WASHER B14-FST
078	16001083	PATH LOCKING
079		SCREW M12x45-12.9
080		SPRING WASER B12-FST
081		SCREW M10x65-12.9
082		SCREW M5X10
083		SCREW M8X25-12.9
084		SCREW M6X10
085		SCREW M5X14-12.9
086		WASHER B 5.3- 140HV
088		O RING 13x2
089		SPRING WASHER B10-FST
090		SCREW M5X30-12.9
091		PIPE PLUG M8x1-ST
092		NUT M5-6-St
093		WASHER B8.4-140HV
094		SCREW M4X8
095		SCREW M5X12
096		WASHER B6.4-140HV
097		SPRING WASHER B5- FST
098		SPRING WASHER B6- FST
099		GREASE ISOFLEXNBU15
111		SCREW M6x20-12.9
120	20204120	WIR JUNCTION BOX ASS.
151	20304151	BALL SCREW AND NUT
152	20302203	MOTOR BASE SEAT
153		COUPLING BKL 60/38/28
155	20304155	TELESCOPIC COVER
156		MOTOR 1FK7101-2AC71-1RG1
158	20304158	RIGHT TELESCOPE COVER BRACKET
159	20304159	LEFT TELESCOPE COVER BRACKET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113 002
153 151 152
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108 107 115 063 035
038
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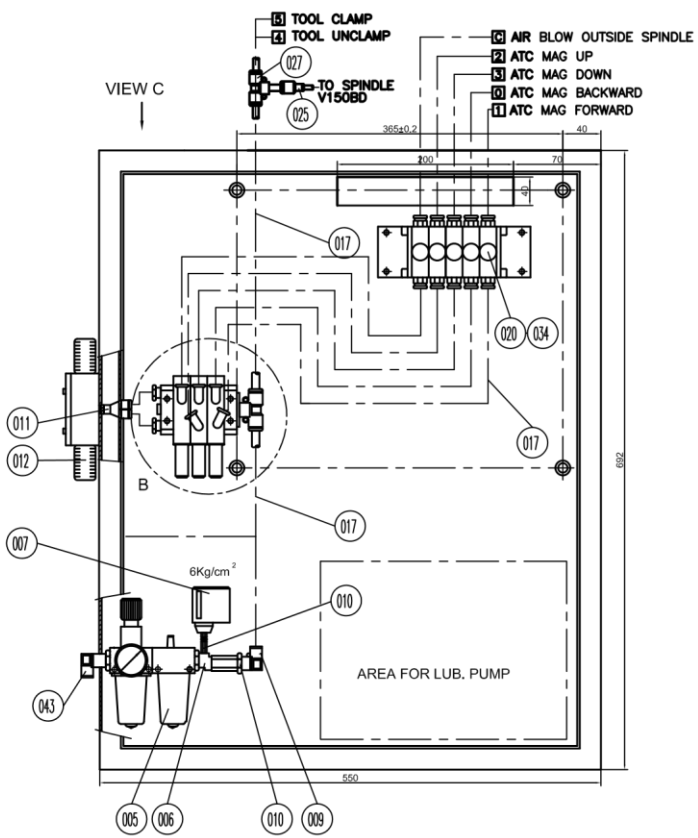
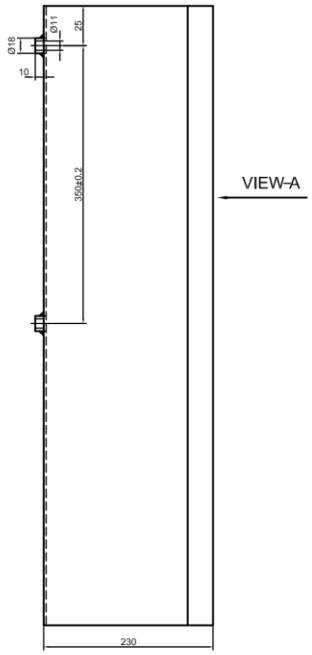
009 008
061
011
010 023 112
020
DETAIL H
202-06-000
Z- AXIS

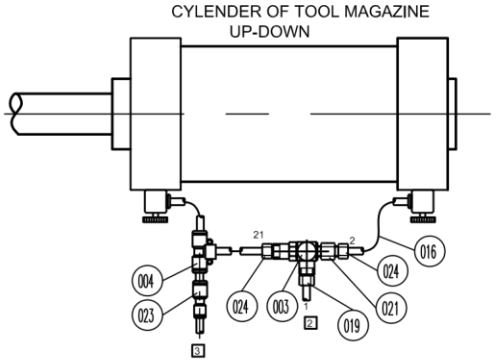
	203-06-000	PART LIST : Z AXIS
Position	**Drawing No.**	**Title Dimension**
002		SCREW M10X60-12.9
008		SCREW M6x20-12.9
009	20202014	BEARING CAP
010	20206010	BEARING SEAT
011		BALL BEARING BSB 3572-2Z-SU
012		SCREW M12X50-12.9
013		PIN A10X50-St
014		LOCKING NUT YSF M30x1.5
015		SCREW M6X25-12.9
018	20202016	MOTOR BRACKET COVER
019	20206019	COVER PLATE
020	20202013	COLLAR
021		SCREW M10X35-12.9
022	20206022	NUT BRACKET
023		PIN A8x40-St
024		SCREW M10x45-12.9
025	20206025	BALL SCREW AND NUT
026	20206026	NUT BRACKET
027		BEARING BSB3062-2Z-SU
028	20206028	PACKING COVER
029	20206029	SIDE COVER
030		SCREW M24x85-8.8
031		SPRING WASHER B24-FST
033	20206033	COLUMN
034	20206034	COLLAR
035	20206035	LIMIT TOUCH BLOCK
036		CABLE CARRIER JN55F.1.100W-FJT,R=250mm-L=1650mm
038	20206038	TOUCH BLOCK ADJUSTING PLATE
041		LIMIT SWITCH XCK-M102
042	20206042	TOUCH BLOCK ADJUSTING PLATE
043	20206043	TELESCOPIC COVER ASS.
044	20206044	SWITCH SEAT
046	20206046	WIPER
047	20206047	WIPER
048		SCREW M5X10
049	20206049	WIPER
050	20206050	WIPER

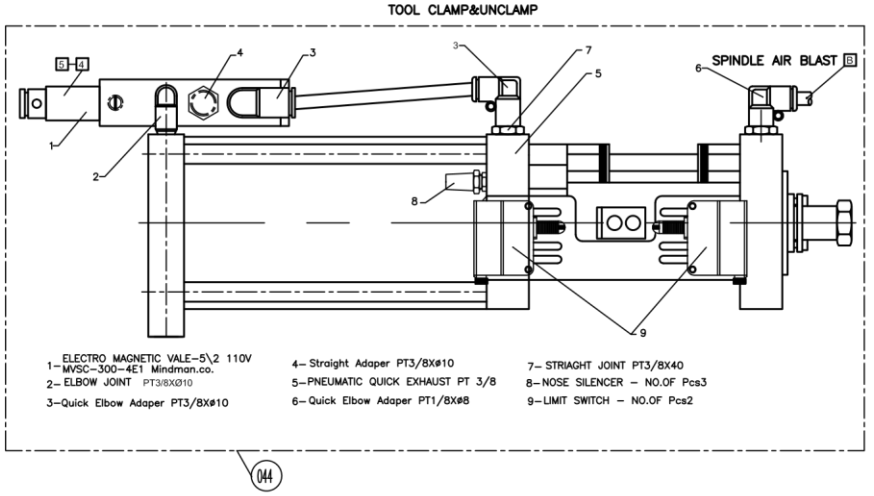
Position	Drawing No.	Title Dimension
051	20206051	TAPER GIB
052	20206052	RIGHT RETAINER PLATE
053		OIL SEAL 40x62x8
054	20206054	HEADSTOCK PROTECTING COVER
055	20202043	ADJUSTING SCREW
056	20206056	LEFT RETAINER PLATE
057	20202165	EYE BOLT
058		SCREW M16x65-8.8
059		TURCITE B FLAT 1.2
061		LOCKING NUT YSF M35x1.5
063	20206063	LIMIT TOUCH BLOCK
065	20202044	SHIM
066		SCREW M4x14
067		SCREW M24x75-12.9
068		PIN A12x60-St
070		NUT M5-6-St
071		SCREW M5x25-12.9
073	20206073	TAPER GIB
076	20206076	PLATE
077	20206077	PLATE
081	26606061	CABLE SUPPORT
082		SCREW M10x100-12.9
083		SCREW M8x16-12.9
084		SPRING WASHER B16-FST
085		SPRING WASHER B8-FST
086		WASHER B6.4-140HV
088		TURCITE B FLAT 1.2
089		TURCITE B FLAT 1.2
090		TURCITE B FLAT 1.2
091		TURCITE B FLAT 1.2
092	20202058	ADJUSTING SCREW
093		NUT M10-6
094	20206094	SHEET
096		SPRING WASHER B6- FST
101		WASHER B13-140HV
102		SCREW M6X10-12.9
105		SCREW M5x10-12.9
106		GREASE ISOFLEXNBU15
107		SCREW M5X14-12.9

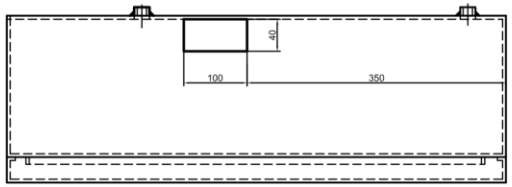
Position	Drawing No.	Title Dimension
108		WASHER B 5.3- 140HV
109		SPRING WASHER B10-FST
111		SPRING WASER B12-FST
112		SCREW M10X30-12.9
113		SCREW M12x40-12.9
114		WASHER A6.4-ST
115		SPRING WASHER B5- FST
116		SCREW M6X12
120		EYE BOLT M10
121	20206121	PLATE
122	20206122	PLATE
123	20206123	PLATE
151	20302203	MOTOR BASE SEAT
152		COUPLING BKL 60/38/28
153		MOTOR 1FK7101-2AC71-1RH1



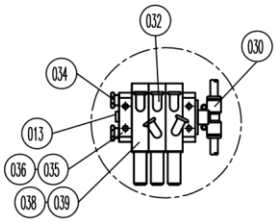




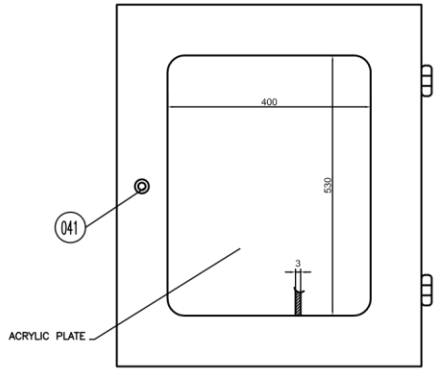




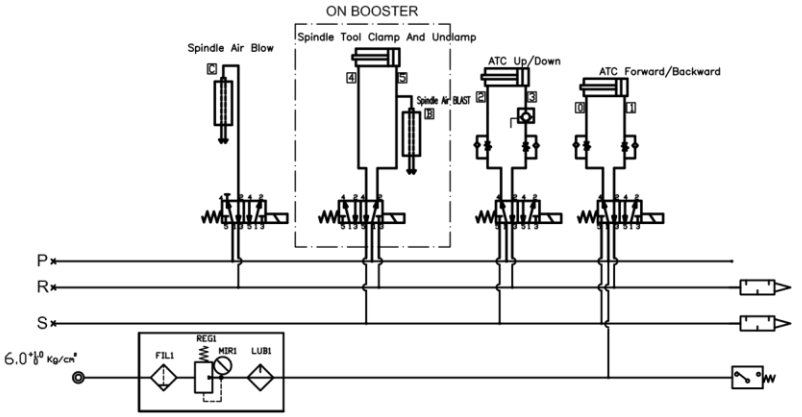
VIEW-C
SCALE:Ø



DETAIL-B



VIEW-A
SCALE:Ø

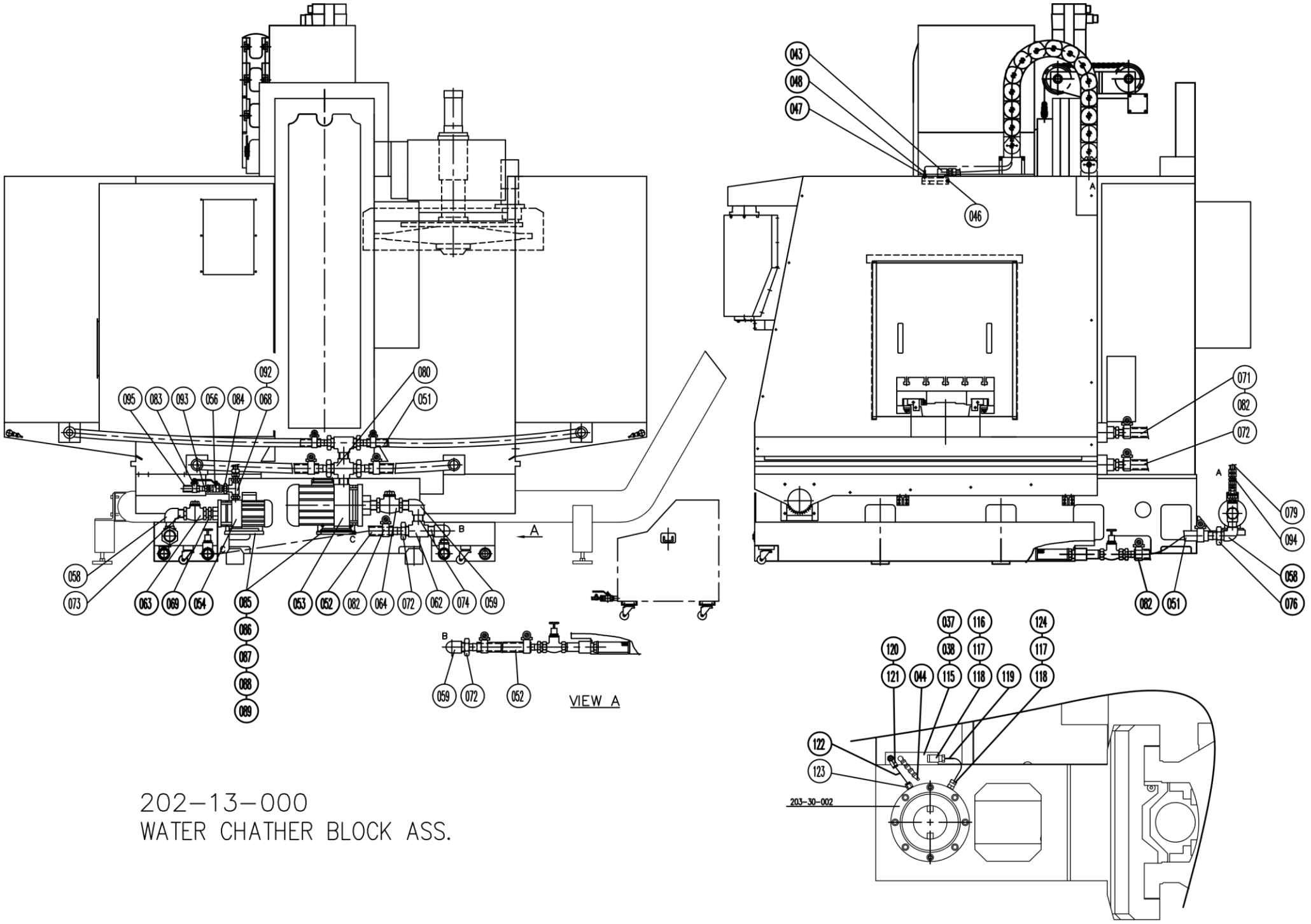


202–07–001

PNEUMATIC BOX

TITLE : 202-07-001 PART LIST: PNEUMATIC BOX

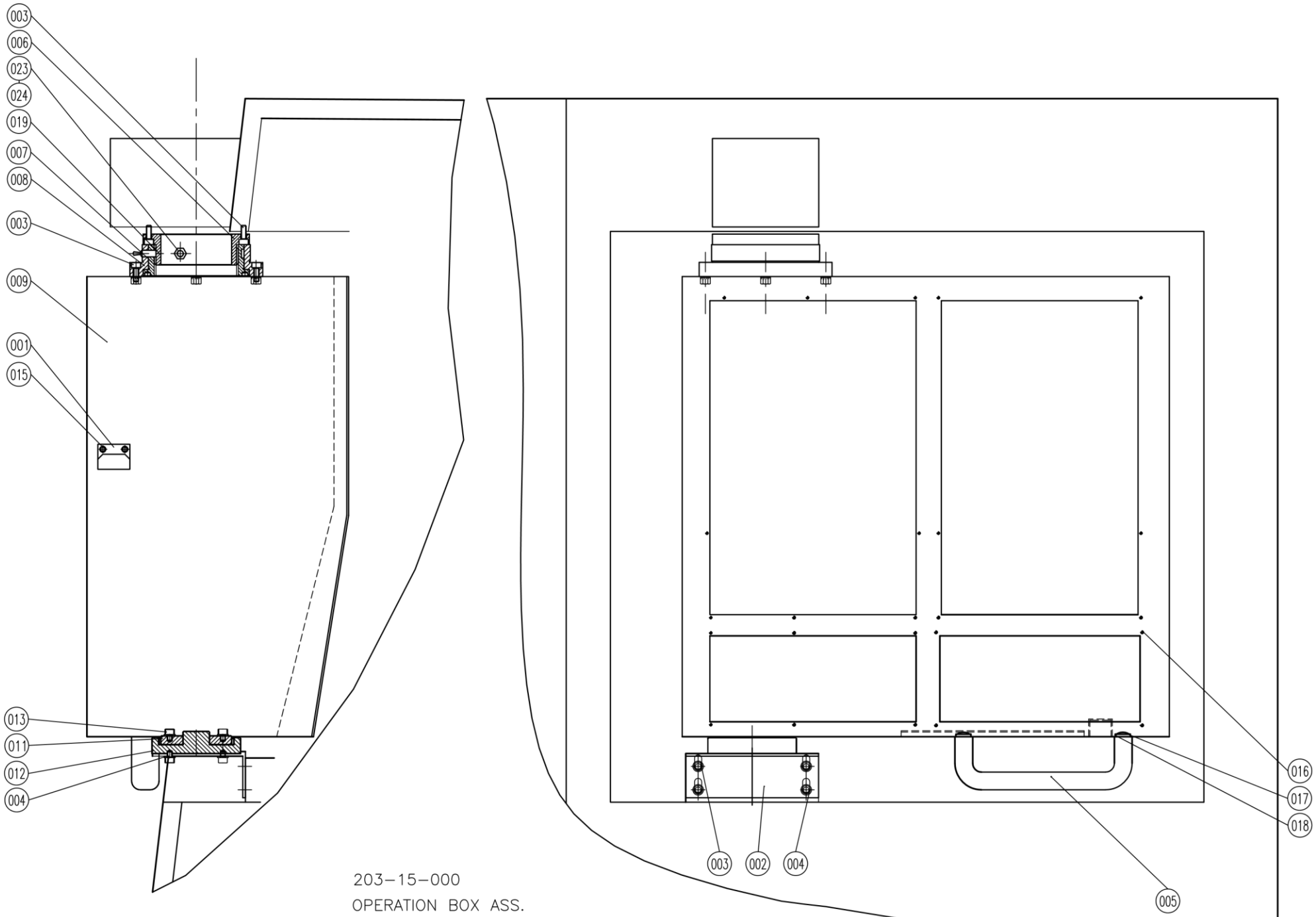
No.	DRAWING NO.	POS.	TITLE DIMENSIONS
1		003	NON-RETURN VALVE 12939 HGL-1/4
2		004	QUICK 3 WAY ADAPTOR 3104 12 00
3		005	SERVICE UNIT FRC-1/2-S-B
4		006	TEE JOINT 2092-08
5		007	PRESSURE SWITCH KP.1 060-1101
6		009	ELBOW TYPE QUICK CHANGE UNIT SPL10-02
7		010	STRAIGHT COPPER JOINT 1863 21 13
8		011	Y PIECES 314 10 13
9		012	SILENCER U-1/2
10		013	CLOSURE PLUG PG2 PT1/4
11		016	PLASTIC TUBE 12x2000mm TYPE PU COLOR OF RED
12		017	PLASTIC TUBE 10x16000mm TYPE PU COLOR OF RED
13		019	COMPRESSION BUSHING 101 10 13
14		020	PNEUMATIC SPEED REGULATOR FL-6002
15		021	SOCKET 2093-04
16		023	QUICK 2 WAY ADAPTOR 3166 10 12
17		024	MALE STUD FITTING 3175 12 13
18		025	QUICK 2 WAY ADAPTOR 3166 06 10
19		027	QUICK 3 WAY ADAPTOR 3104 10 00
20		030	Quick 3 way Adaper 3108 10 13 R1/4
21		032	ELBOW TYPE QUICK CHANGE JOINT 1002
22		034	QUICK CHANGE JOINT SPC 10-02
23		035	MANIFOLD BN 2608A-M5
24		036	SCREW M6X22-12.9
25		038	PLUG PT1/4"
26		039	ELECTRO MAGNETIC VALVE MVSD-260-4E1 110V
27		041	KEY FOR BOX Zx403A
28		043	EXTENDED ELBOW 3129-12-21
29		044	PNEUMATIC BOOSTING CYLINDER G5000



202-13-000
WATER CHATHER BLOCK ASS.

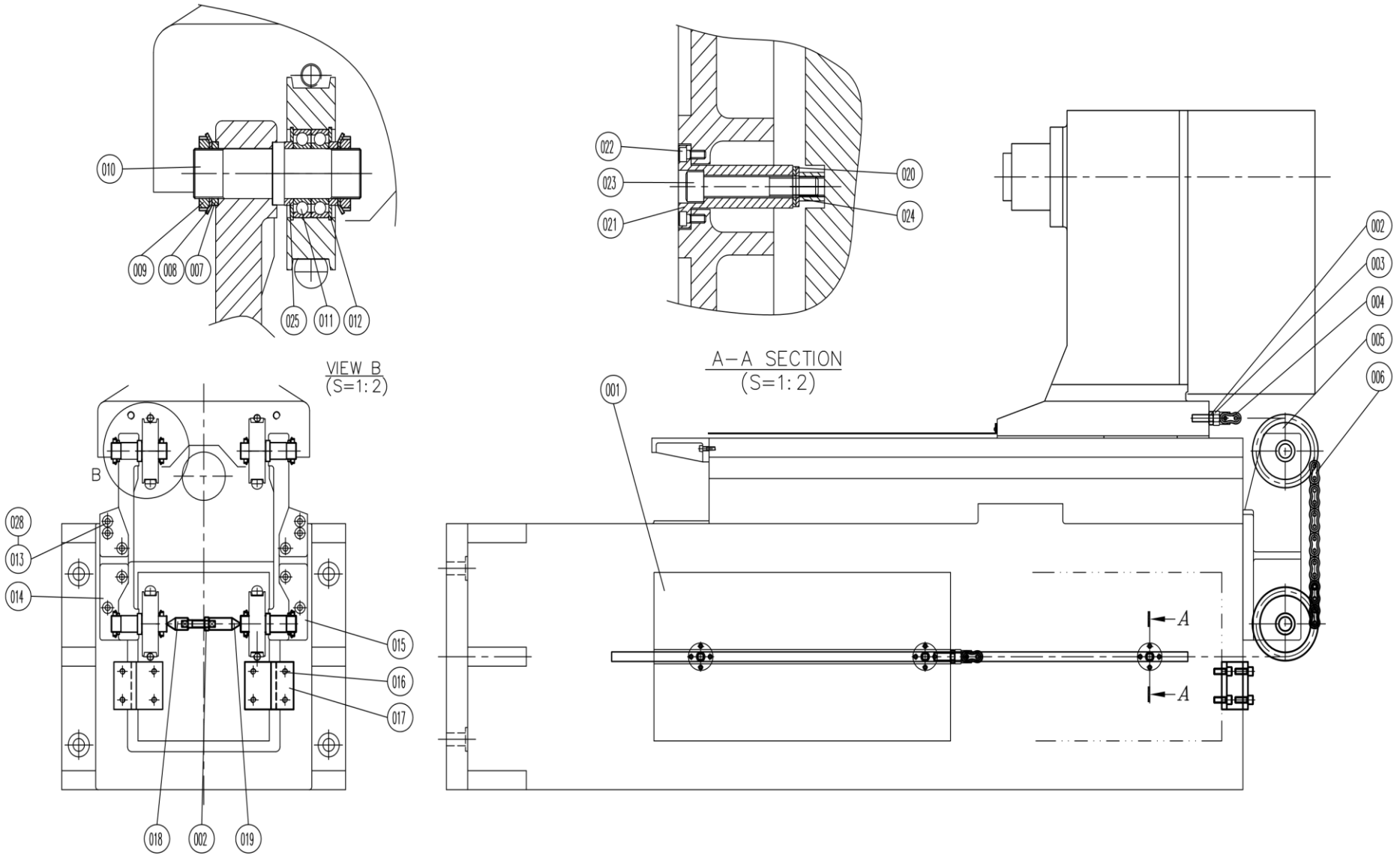
	203-13-000	PART LIST : WATER CATCHER BLOCK
Position	**Drawing No.**	**Title Dimension**
037		SCREW M6X40-12.9
038		WASHER A6.4-ST
043		90 MALE ELBOW 1033 (12-08)
044		ADJ.COOLANT HOSE PT3/8X289X1/4" ROUND NOZZLES
046		PIPE PLUG R1/4-ST
047		QUICK COUPLING SPL 10-02
048		NYLON TUBE 10x6.5-TYPE PU-RED
051		STEEL WIRE HOSE TS-32
052		STEEL WIRE HOSE TS-38
053		TROTTED PUMP CM10-3-A-R-A-V-AQQV /3X380
054		TROTTED PUMP CM3-3 A-R-A-V-AQQV /3X380-415
056		IV BALL VALVE 12
058		ELBOW 1 1/4″-A1-GALVANIZE
059		ELBOW 1 1/2"-A1
062		T JOINT 1 1/2"-B1
063		CHECK VALVE 1,1/4"
064		CHECK VALVE 1,1/2"-M
068		NIPPLE 2083 (16-12)
069		REDUCING NIPPLE N8 (T1=1,1/4",T2=1")
071		STRIGHT HOSE JOINT PT1 1/2" X PE1 1/4"
072		STRIGHT HOSE JOINT PT1,1/2xPE1 1/2
073		DOUBLE END TREAD JOINT 1,1/4"
074		STRIGHT HOSE JOINT 1,1/2"-60 TYPE 2084
076		STRIGHT HOSE JOINT 1,1/4PTx1 1/4PH N.46
079		HIGH PRESSURE HYDRAULIC PF3/4x5000L
080		EQUAL GROSS 1 1/2"-C1
082		HOSE CLIP SA 32-50
083		HOSE CLIP SA 20-32
084		NIPPLE 2083(12)
085		BASE MOTOR SUB ASS.
086		SCREW M8X30-12.9
087		WASHER A8.4-ST
088		NUT M8-6
089		WASHER B8.4-140HV
090	20213090	SHEET
091	20213091	SHEET
092		T JOINT 3/4" -B1
093		HOSE FITTING PIP 24240 PT 3/4"xPE 3/4"
094		90 MALE ELBOW 1033(12)
095		HOSE 19X26X1250-GREEN

Position	Drawing No.	Title Dimension
115	20313115	BLOCK
116		ELBOW ADAPTER PH-1003
117		COMPRESSION BUSHING PA-10
118		COMPRESSION SLEEVE PB-10
119		ALUMINUM PIPE 10X120
120		QUICK ELBOW SPL6-01
121		FLOW REGULATOR PUSH-IN FITTING TUBE 6X1/8
122		NYLON PIPE N6X1200mm
123		QUICK STRAIGHT SPC6-01
124		STRAIGHT ADAPTER PD-1003



203–15–000
OPERATION BOX ASS.

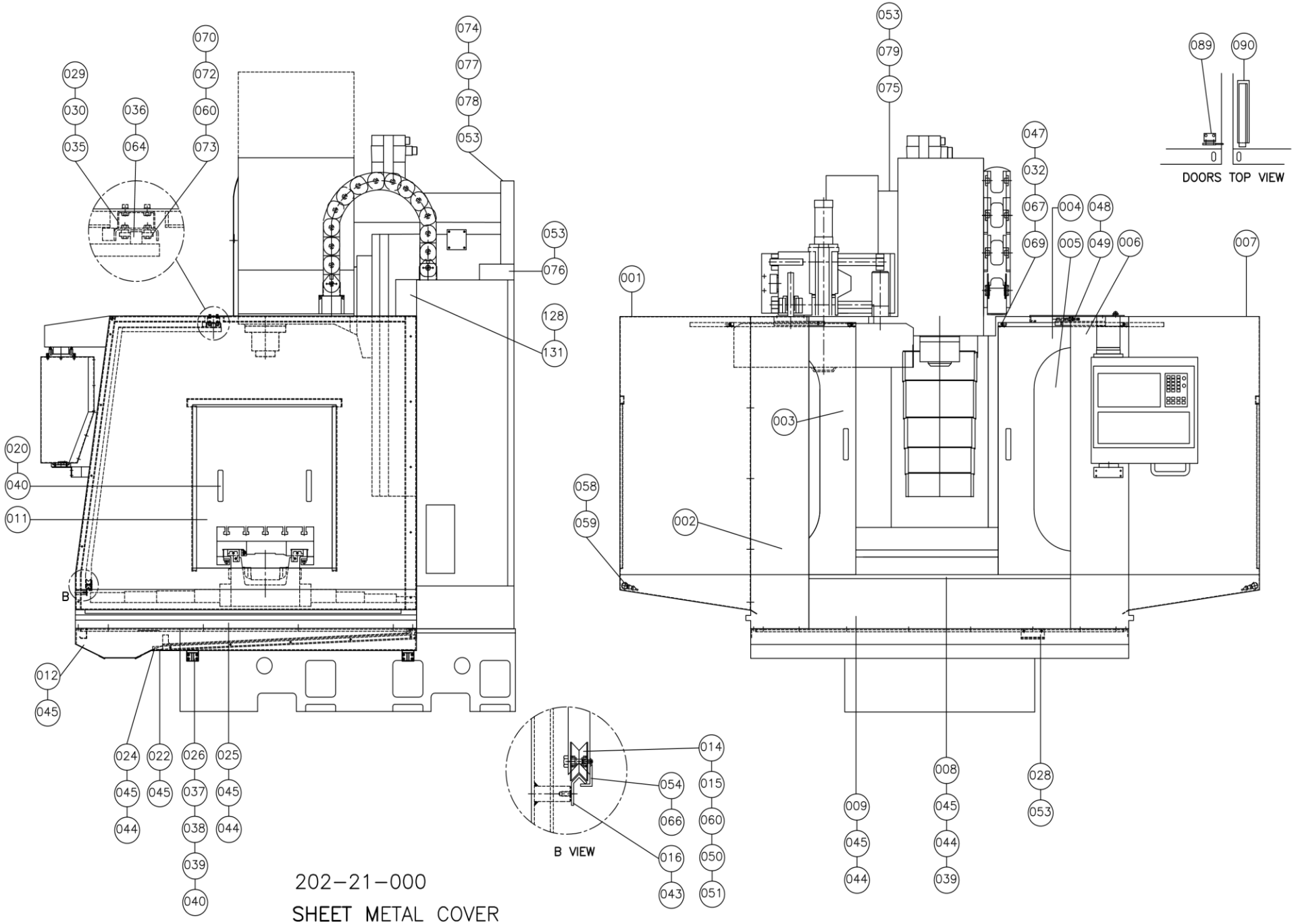
	203-15-000	PART LIST : OPERATION BOX
Position	**Drawing No.**	**Title Dimension**
001	20320001	FIXING SEAT
002	20215002	FIXING SEAT
003		SCREW M6x20-12.9
004		WASHER A6.4-ST
005		U-HANDLE GN 625-179-SW
006	20215006	CRT RADIAL ARM
007	20215007	LOCKING NUT
008	20215008	ROTATING SEAT
009	21656649	SUB ASS.
010	21656652	PANNEL
011	20215025	LINING SLEEVE
012	20215026	ROTATING SEAT
013		SCREW M6X10-12.9
014	21616651	COVER
015		SCREW M5X10
016		SCREW M4X10
017		SCREW M8X14
018		WASHER 8.4-St
019		SCREW M8x16-12.9
023		SET SCREW M8X20-45H
024		NUT BM8-5



202–18–000

COUNTER WEIGHT ASS.

	203-18-000	PART LIST : COUNTER WEIGHT ASS.
Position	**Drawing No.**	**Title Dimension**
001	20218001	COUNTER WEIGHT SUB ASS.
002		NUT M16-6
003	20218003	LIFTING BOLT
004		CHAIN CONNECTING A-LH1234
005	20218005	SPROCKET WHEEL
006		CHAIN CONNECTING LH1234x74
007	20218007	WASHER
008		LOCK WASHER AW07A(M35)
009		LOCK NUT M35x1.5
010	20218010	SPROCKET GEAR SHAFT
011		BEARING 6007-2ZR
012		CIRCLIP 62X2
013		SCREW M12x40-12.9
014	20218014	TOP HEAD
015	20218015	TOP HEAD
016		SCREW M12x35-12.9
017	20218017	FIXING SEAT
018	20218018	SUPPORT SHAFT
019	20218019	NUT
020		WASHER B15-140HV
021	20218021	SUPPRT SHAFT
022		SCREW M6X16-12.9
023		SCREW M14x90-12.9
024	20218024	COUNTER WEIGHT GUIDE
025	20218025	WASHER
026	20218026	FIXING SEAT
028		SPRING WASHER B12-FST
029	20218029	COUNTER WEIGHT
030		EYE BOLT M16

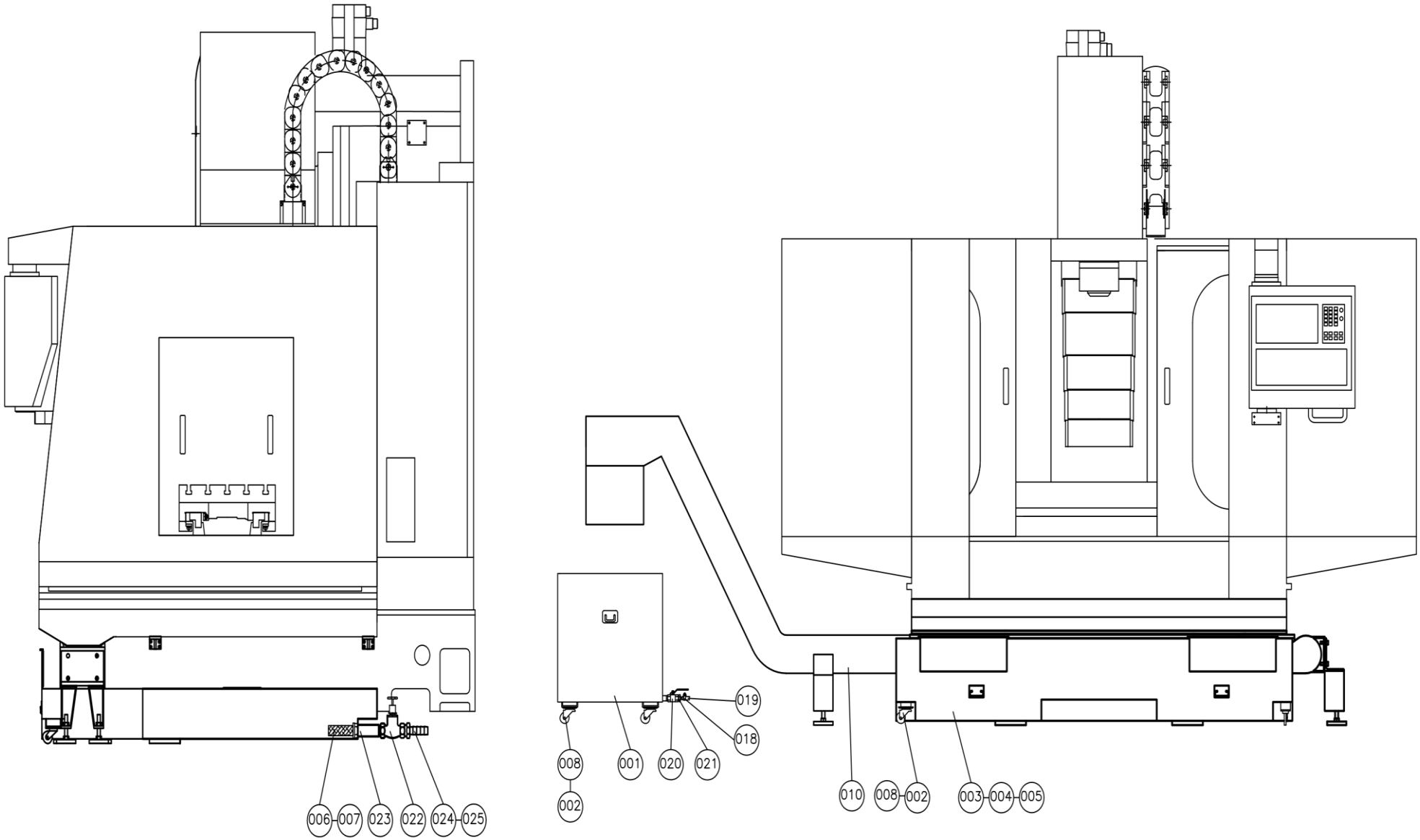


202-21-000

SHEET METAL COVER

	203-21-000	PART LIST : SHEET METAL COVER
Position	**Drawing No.**	**Title Dimension**
001	20221001	LEFT SIDE DOOR
002	20221002	LEFT GUARD
003	20221003	LEFT FRONT DOOR
004	20221004	RIGHT FRONT DOOR
005	20221005	ACRYLIC PLATE
006	20221006	RIGHT GUARD COVER
007	20221007	RIGHT SIDE DOOR
008	20221008	PROTECTION ENCLOSURE
009	20221009	PROTECTION COVER
011	20221011	ACRYLIC PLATE
012	20221012	BASE COVER
014	20221014	DOOR ROLLER SEAT
015	20221015	MANDREL
016	20221016	GUIDE WAY
020		U-HANDLE GN 625-179-SW
022	20221022	COOLANT GUIDING PLATE
024	20221024	COOLANT GUIDING PLATE
025	20221025	COOLANT GUIDING PLATE
026	20221026	TELESCOPIC COVER BRACKET
028	20221028	COVER
029	20221029	RIGHT BEARING SEAT
030	20221030	LEFT BEARING SEAT
032		STOPPER BOLT B15x15
035		SCREW M6x12-12.9
036	20221036	UPPER GUIDE WAY
037		WASHER 8.4-140HV
038		SET SCREW M6x40-45H
039		NUT M6-6
040		SCREW M8X25-12.9
041		SCREW M8x22-12.9
042	20221042	PLATE
044		WASHER A6.4-ST
045		SCREW M6X16
046	13101033	PACKING
047	20221047	STOP SEAT
048	20221048	CARRIER TUBE
049		NUT M10-6
050		SCREW M4X10
051		WASHER 4.3-140 HV
052		WASHER 6.4-140HV
053		SCREW M5X16
054	19221015	TELESCOPIC COVER BRACKET
055		WASHER B 5.3- 140HV
058		CONNECTORS PART NO.51804 BSPT/PT 3/8"

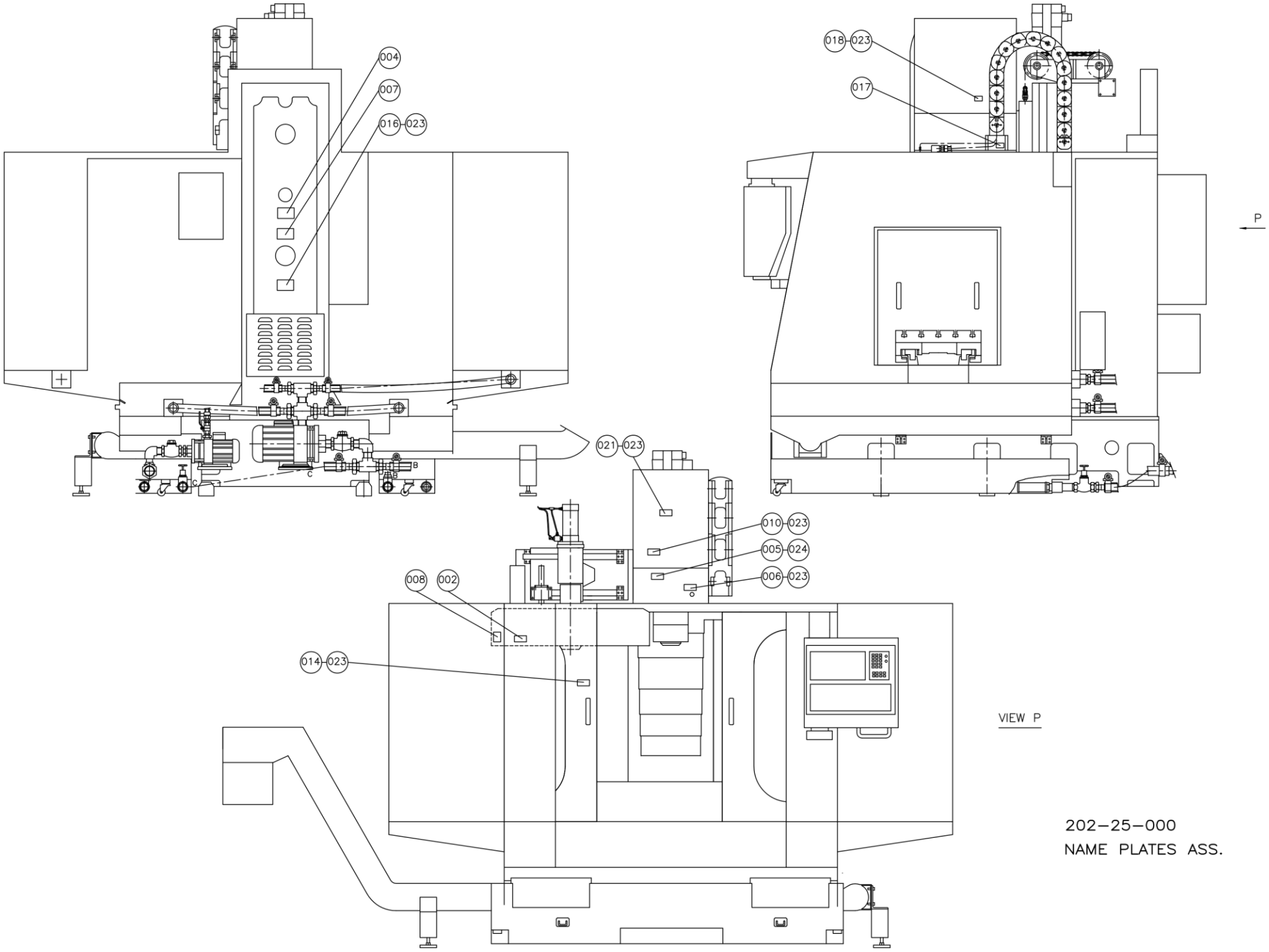
Position	Drawing No.	Title Dimension
059		1.1/4" FLARE NOZZLES PART NO.51807
060		BEARING 626 2RS
064		SCREW M6X16-12.9
066		SCREW M6x8-12.9
067		SCREW M5X12-8.8
069		NUT M5-6-St
070	19221037	BUSH
071		WASHER A5.3-St
072	19221038	MANDREL
073		SPRING WASHER B6- FST
074	20221074	CABLE CANAL
075	20221075	CABLE CANAL
076	20221076	COVER CANAL
077	20221077	COVER CANAL
078	20221078	COVER CANAL
079	20221079	COVER CANAL
089	20221089	ANGLE L50x32x4
090	20221090	ANGLE L56x36x5
128	20321128	CABLE CANAL
131		SCREW M4X8



202-24-000

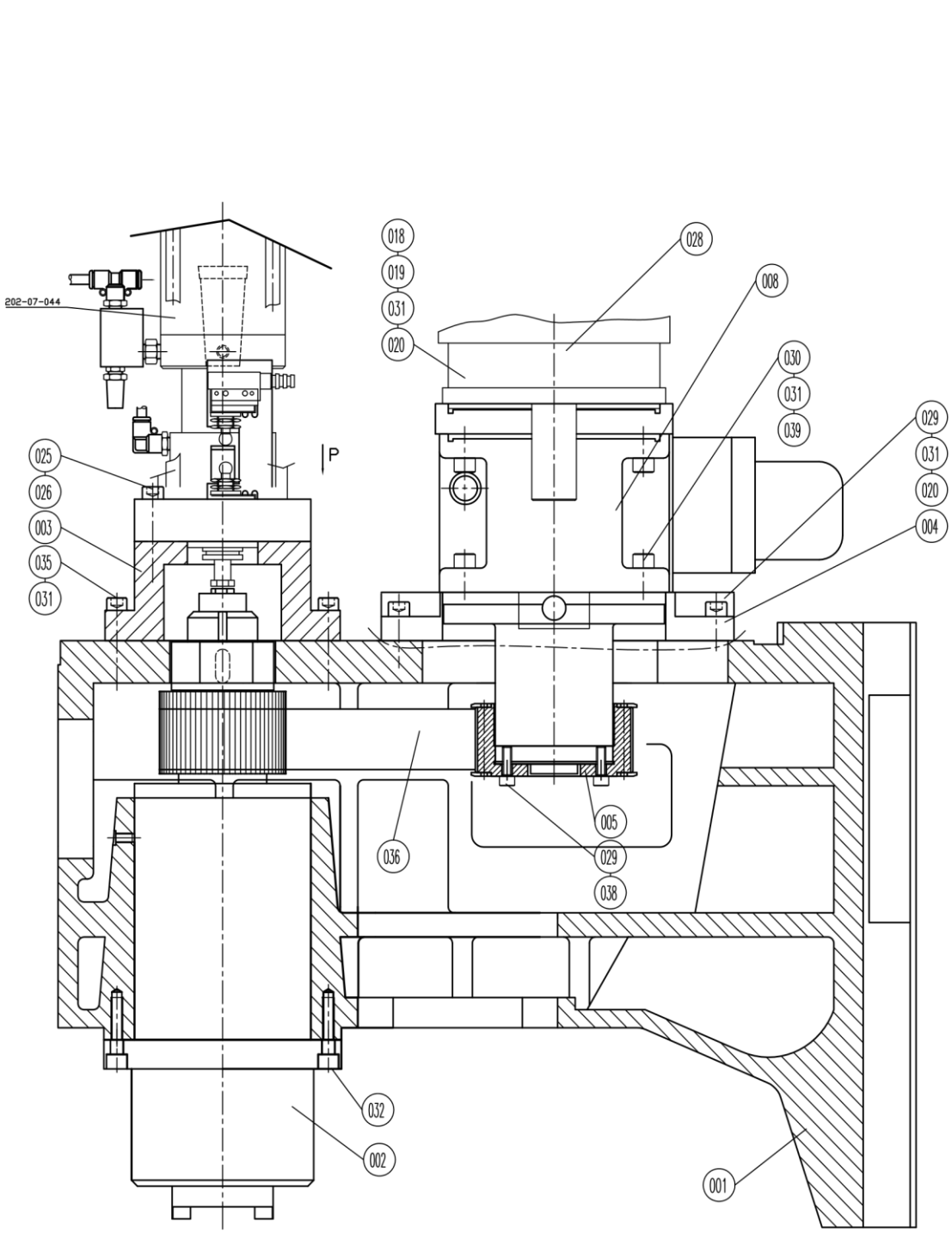
CHIP CONVEYOR ASS.

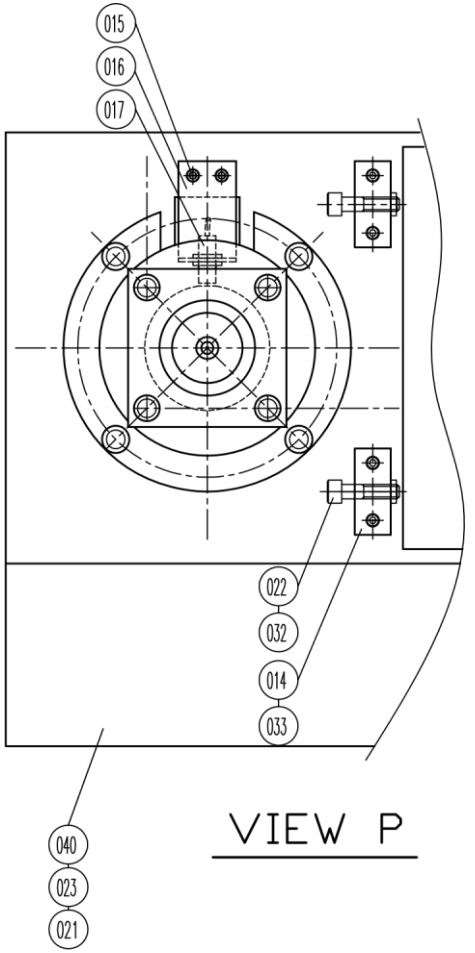
	202-24-000	PART LIST : CHIP CONVEYOR SUB ASS.
Position	**Drawing No.**	**Title Dimension**
001	20224001	CHIP COLLECTOR SUB ASS.
002		CASTER D=50 / CASTER 2012
003	20224003	COOLANT TANK
004	20224004	COOLANT TANK FILTER
005	20224005	COOLANT TANK FILTER
006		OIL FILTER MF-10
007		PLUG 1 1/2 " - T9
008		SCREW M6X16-12.9
009		HANDLE
010	20224010	CHIP CONVEYOR
013	20224013	SHEET
014	20224014	SHEET
015	20224015	SHEET
016	20224016	PIPE
017	20224017	NET PLATE
018		HOSE CLIP SA 20-32
019		MESH PLASTIC HOSE 3/4"
020		IV BALL VALVE 08
021		STRAIGHT HOSE JOINT PT1/2" x PE3/4" NO.46
022		GATE VALVE S 40
023		STRIGHT HOSE JOINT 1,1/2"-120 TYPE 2084
024		STRAIGHT HOSE JOINT PT1,1/2"XPE1,1/2"
025		STRIGHT HOSE JOINT PT1 1/2" X PE1 1/4"



202–25–000
NAME PLATES ASS.

	202-25-000	PART LIST : NAME PLATES ASS.
Position	**Drawing No.**	**Title Dimension**
002	20225002	NAME PLATE ATC
004	20225004	NAME PLATE
005	20225005	NAME PLATE
006	20225006	NAME PLATE
007	20225007	NAME PLATE
008	20225008	NAME PLATE BT-40
010	20225010	NAME PLATE
011	20225011	NAME PLATE
014	20225014	NAME PLATE
016	20225016	NAME PLATE
017	20225017	NAME PLATE
018	20225018	NAME PLATE
019	20225019	NAME PLATE
021	20225021	NAME PLATE
023		BLIND RIVET 2.4X6
025	20225025	LABLE



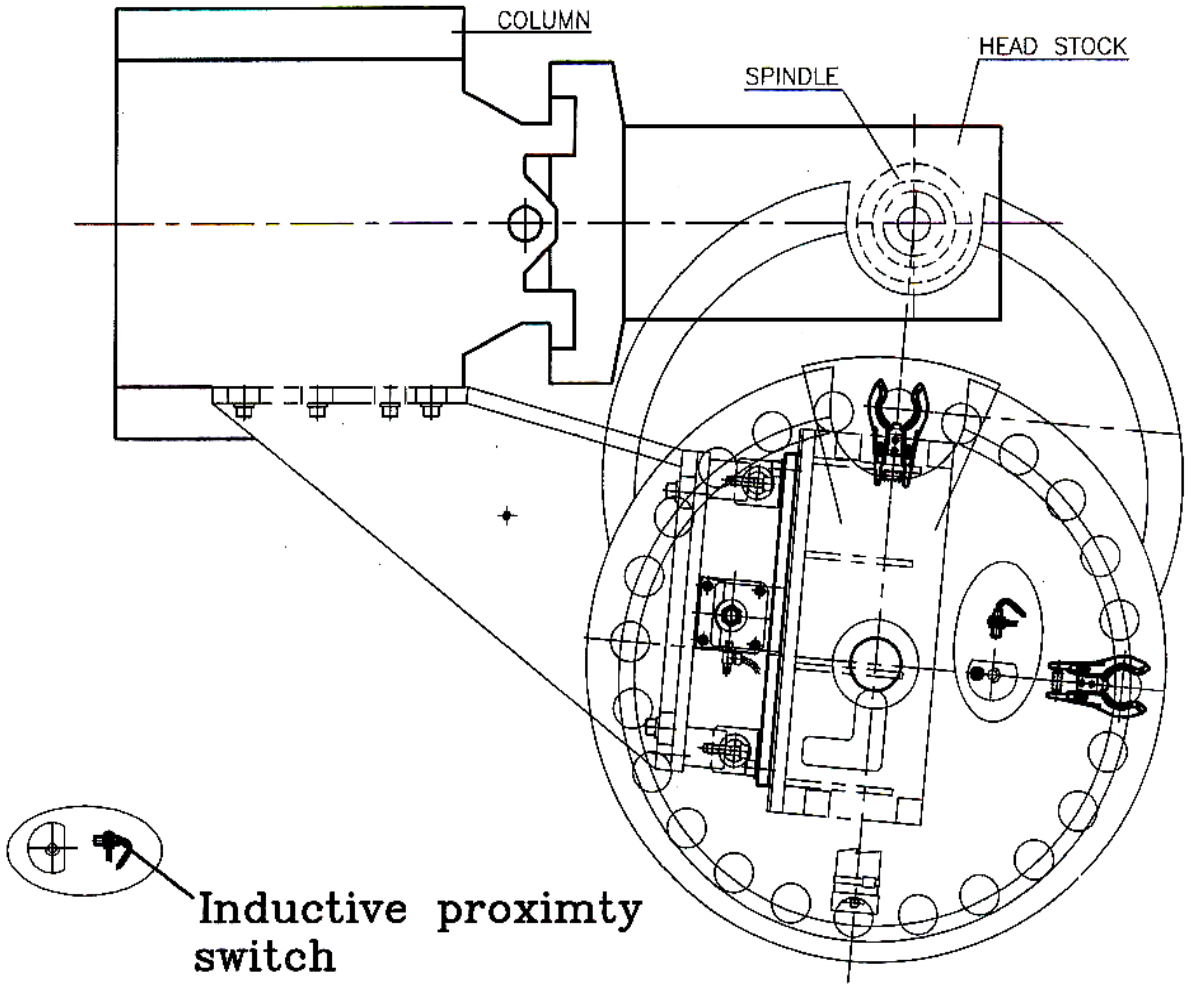


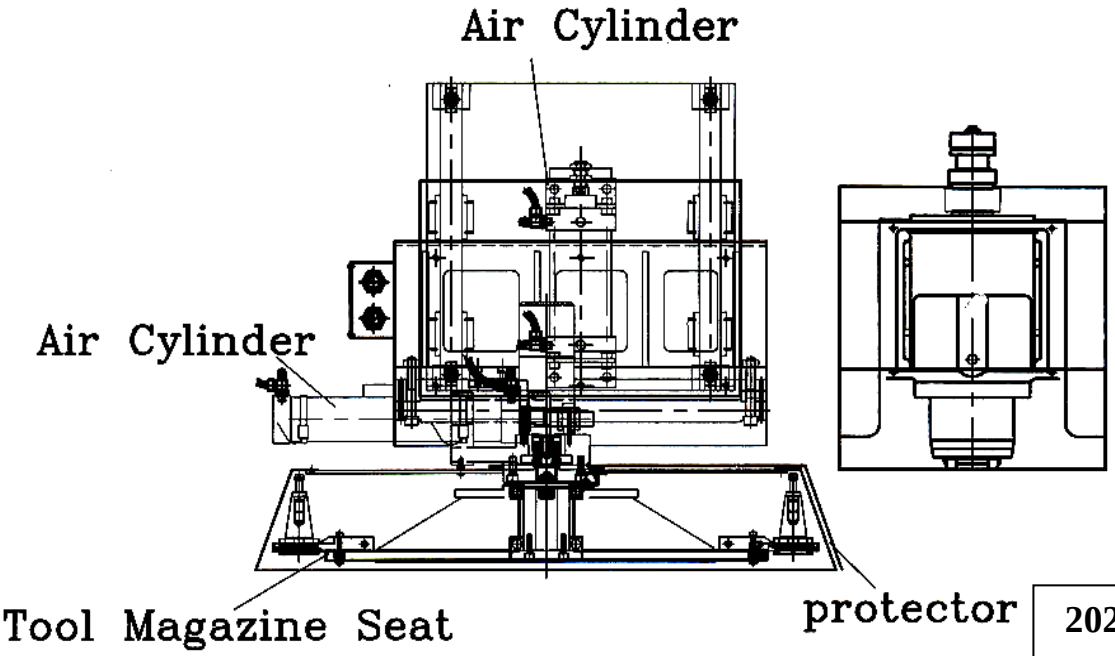
VIEW P

203–30–000
SPINDLE ASS.

	203-30-000	PART LIST : SPINDLE ASS.
Position	**Drawing No.**	**Title Dimension**
001	20330001	HEADSTOCK
002		SPINDLE V150BD/BT40 8000 RPM
003	20330003	SLAP RING SEAT
004	20330004	MOTOR BASE PLATE
005	20330005	PULLEY SUB ASS.
006	20330006	PULLEY
007	20330007	WASHER
008	20322007	GEAR BOX 2K120(SEIMENS 1PH7107)
014	20322011	ADJUSTING BLOCK
015		SCREW M5x10-12.9
016	20330016	SHEET
017		SENSOR IPS-302-OP-12-L50
018		SCREW M12x70-8.8
019		NUT M12-6-st
020		WASHER B13-140HV
021		WASHER B6.4-140HV
022		NUT BM10-11H
023		SCREW M6X10-12.9
025		SPRING WASHER B10-FST
026		SCREW M10x55-12.9
028		SPINDLE MOTOR 1PH8107-1DF02-2HA1
029		SCREW M12X25-12.9
030		SCREW M12X50-12.9
031		SPRING WASER B12-FST
032		SCREW M10x40-12.9
033		SCREW M8X25-12.9
035		SCREW M12x40-12.9
036		TIMING BELT GT 5MR-950-25
037		SCREW M5X10
038		WASHER "S"8
039		WASHER 12X18X1.5
040	20330040	HEAD STOCK SPLASH GUARD
041		TURCITE B FLAT 1.2
042		TURCITE B FLAT 1.2
043		TURCITE B FLAT 1.2

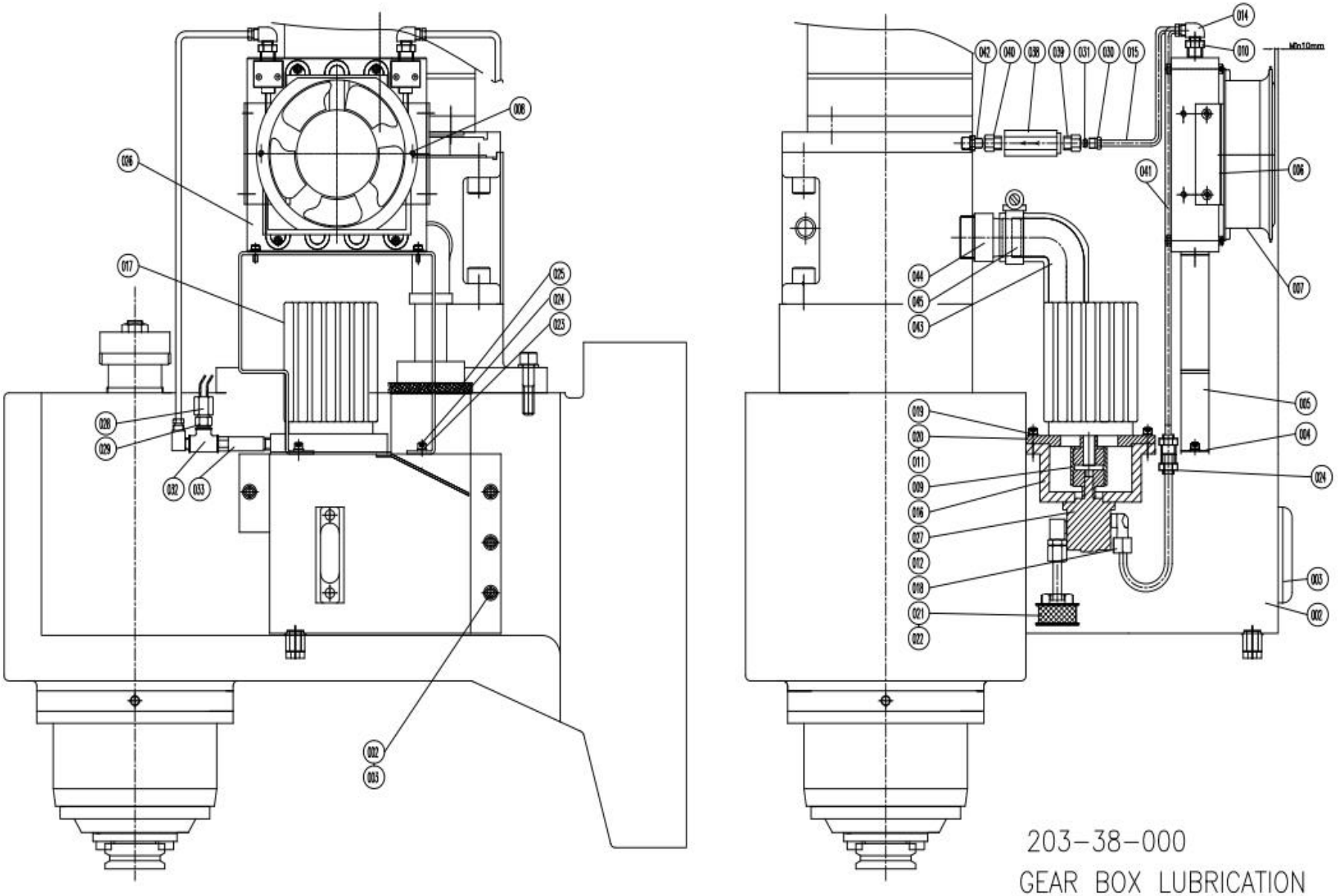
ATC MAGAZINE





202-37-000

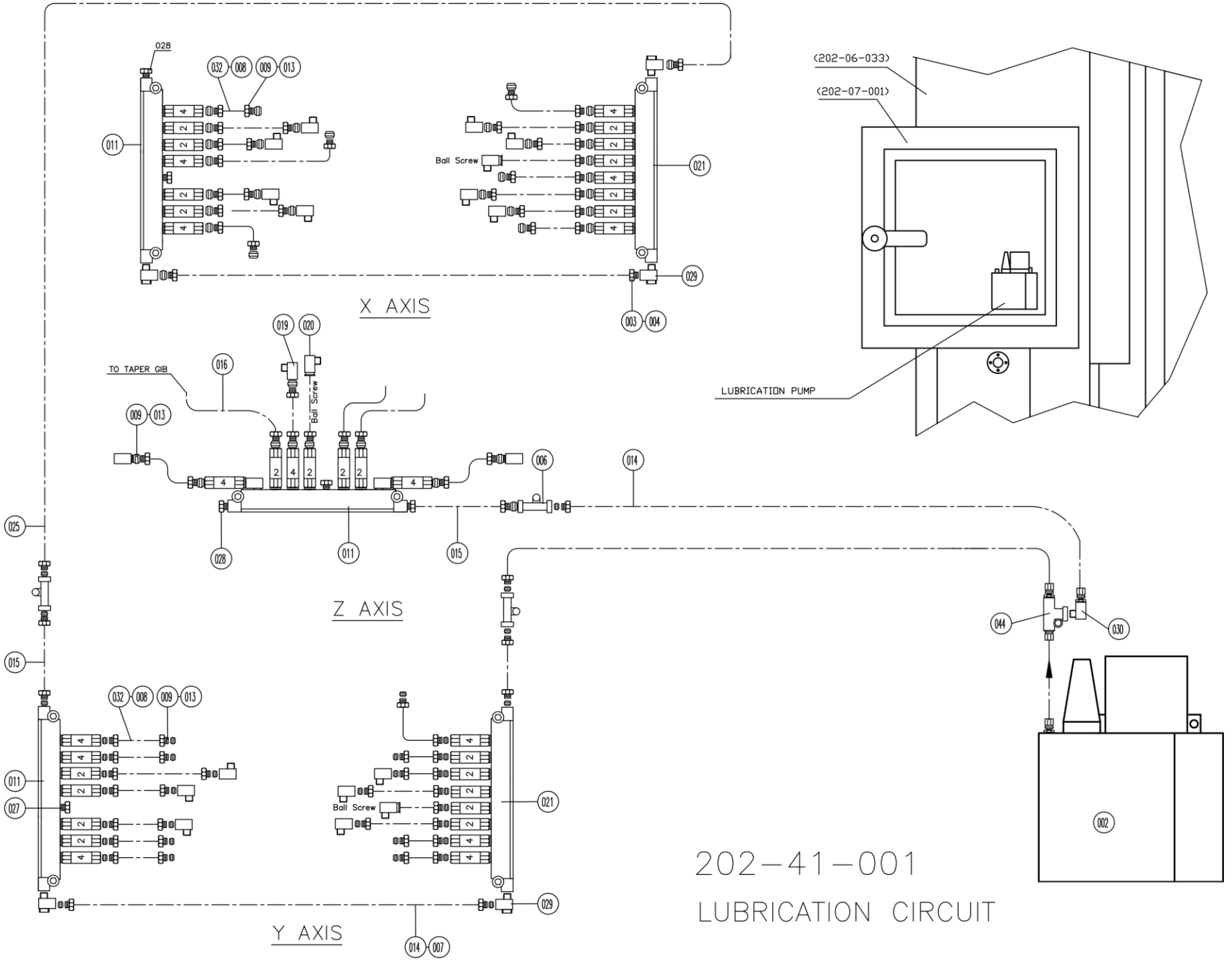
	203-37-000	PART LIST : ATC ASS.
Position	**Drawing No.**	**Title Dimension**
001	20237001	BRACKET
002	20237002	ATC CATCHARM TYPE BT40-24T
003	20237003	ADJUSTING BLOCK
005		SCREW M12x45-12.9
006		SCREW M16x50-12.9
007		WASHER B17-140HV
008		SPRING WASHER B16-FST
009	20237009	ADJUSTING KEY
010		SCREW M5X16
011		WASHER B13-140HV
012		SPRING WASER B12-FST
013		PIN A10X40-St
015		SCREW M12x75-12.9
016		NUT M12-6-st
017		SCREW M12x75-10.9
019		SCREW M4X8



203-38-000

GEAR BOX LUBRICATION

No.	DRAWING NO.	POS.	TITLE DIMENSIONS	NO.OF PCS
1		002	TANK WELDING SUB ASS.	
2		003	LEVEL INDICATOR EHCX76	
3		004	SCREW M6X10-12.9	
4		005	FIXING SEAT (BLACKENED)	
5		006	RIGH ANGLE PLATE	
6		007	COOLING FAN MODEL SK162 APSH 220/140V	
7		008	SCREW M4X55	
8		009	COUPLING GEAR	
9		010	REDUCING NIPPLE 1/2"X1/4"-N4-GALVANIZED	
10		011	SCREW M5X16	
11		012	SCREW M6X16	
12		014	ELBOW ADAPTER 90° PH-602	
13		015	COPPER TUBE 6X1-485mm CuZn39Pb3	
14		016	FLANG	
15		017	ELECTRO MOTOR 0.09 KW 3 PHASE 4P 50HZ	
16		018	MALE STUD ELBOW FITTING - GL6-ST	
17		019	SCREW M6X25	
18		020	FLANG MOTOR (BLACKENED)	
19		021	STRAIGHT HOSE JOINT TYPE 2084 04-50	
20		022	OIL FILTERING SCREEN MF-02-60	
21		023	WASHER A6-FST	
22		024	MALE STUD BULKHEAD COUPLING -RL6-ST	
23		025	RUBBER	
24		026	RADIRATOR ASS.	
25		027	PUMP YS - TOP-11A	
26		028	PRESSURE SWITCH PMM 1A 18K V48/0.5A	
27		029	STRAIGHT ADAPTER PD1002	
28		030	COMPRESSION BUSHING MODEL PA-6	
29		031	COMPRESSION SLEEVE MODEL PB-6	
30		032	T JOINT 1/4"-B1-GALVANIZED	
31		033	LONG NIPPLE 2084 04-80	
32		034	PIPE PLUG 1/4 PT TYPE 7-1	
33		035	NUT M5	
34		036	SCREW M5X55-12.9	
35		038	CHECK VALVES IC-02	
36		039	STRAIGHT ADAPTER PD-602	
37		040	STRAIGHT ADAPTER PD-102	
38		041	FLEXIABLE HOSE PPST00-6-500mm	
39		042	COUPLING L6A-G1/8-St	
40		043	TOYO SPRING HOSE 38x48x150mm	
41		044	PIPE FITTING	
42		045	CLAMP 32-50	



202-41-001

LUBRICATION CIRCUIT

TITLE: 202-41-000 PART LIST: LUBRICATION SYSTEM

No.	DRAWING NO.	POS.	TITLE DIMENSIONS
1		002	LUBRICATION PUMP CEVB 05C253FPL
2		003	COMPRESSION BUSHING PA-6
3		004	COMPRESSION SLEEVE PB-6
4		006	JUNCTION 2-WAY JD-6
5		007	SPRING SG-61800
6		008	SPRING SG-41800
7		009	COMPRESSION SLEEVE PB-4
8		011	VOLUME DESTRIBUTOR CAB-8-4 2 2 4 2 2 4 (2xM10x1)
9		013	COMPRESSION BUSHING PA-4
10		014	NYLON PIPE N-6 PPN02001 L=9m
11		015	ALUMINUM TUBE 6x1x2600
12		016	ALUMINIUM TUBE 4X1X1700
13		019	ELBOW ADAPTOR PH-408
14		020	ELBOW PUSH IN FITTING 03.255.6 (ø4-M8x1)
15		021	VOLUME DESTRIBUTOR CAB-8-4 4 2 2 2 2 2 4 (2xM10x1)
16		025	FLEXIBLE HOSE PPST 00-6-700
17		027	CLOSURE PLUG PG 004
18		028	CLOSURE PLUG PUNOM 100-2 (BORE ø6)
19		029	SWIVEL ELBOW ES-601
20		030	ELBOW ADAPTOR PH-610
21		032	NYLON PIPE N-6 PPN01001
22		044	JUNCTION 3WAY PKD-6