VERTICAL
MACHINING CENTERS
INSTRUCTION MANUAL

MODEL NO: VMC 1050

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' !!

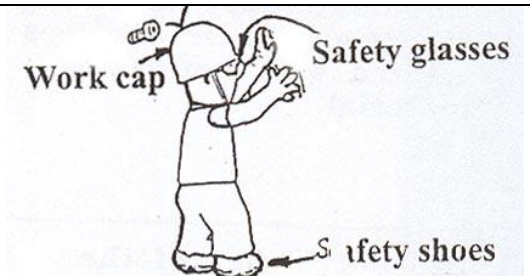
CONTENTS

IV. MAINTENANCE

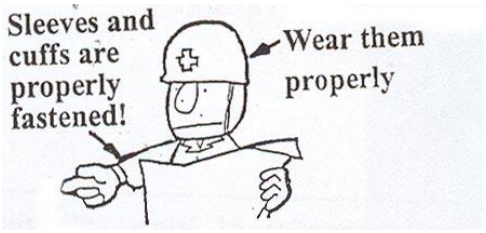
I. PRECAUTIONS REGARDING SAFETY

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.

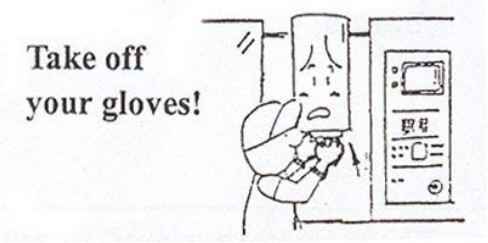
OVERALL SAFETY PRECAUTIONS



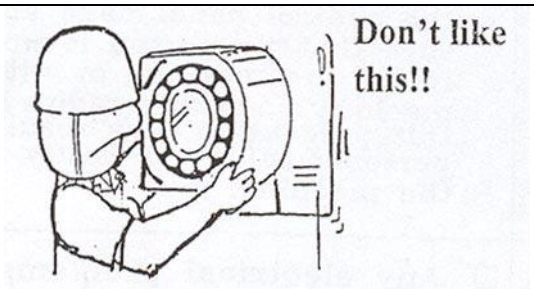
□ When working, wear protective clothing appropriate for safety (safety shoes, work cap, safety, etc.)



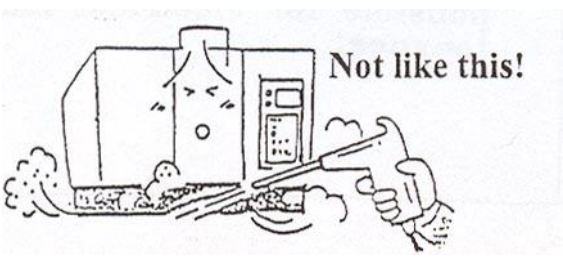
□ Make sure your work cap is worm properly, and that your sleeves and cuffs are properly fastened. Wear the proper clothes for working.



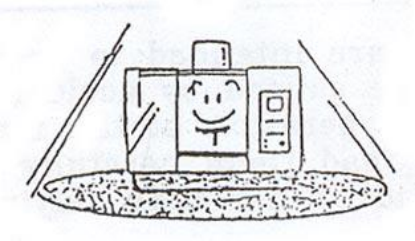
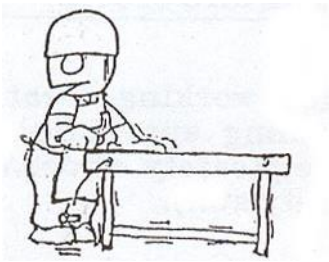
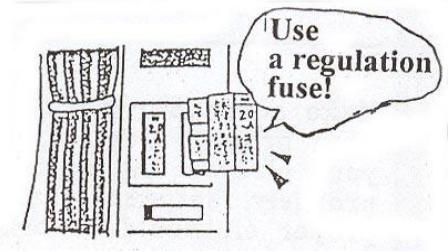
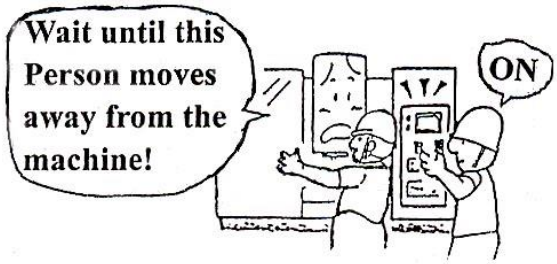
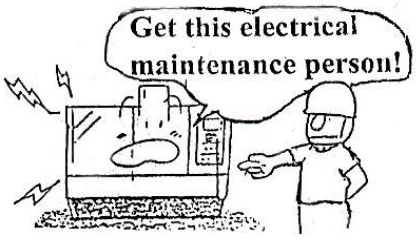
□ Do not wear gloves when operating the equipment.

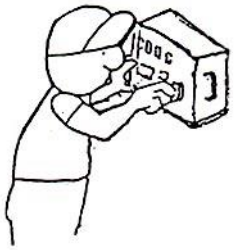


□ Never remove safety devices or safety covers from the equipment.



□ 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.

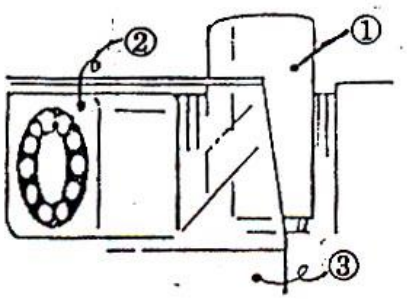
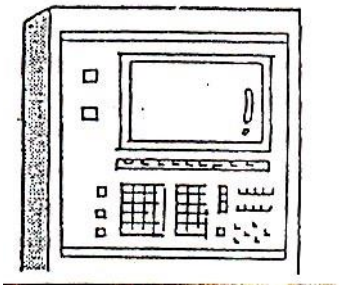
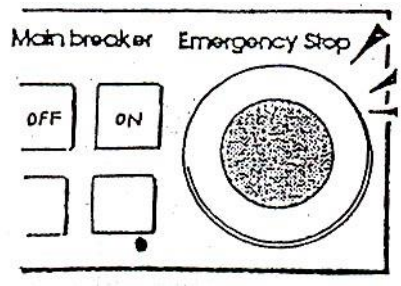
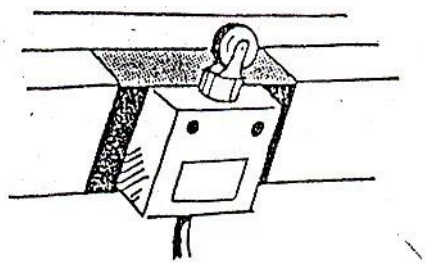
	□ Make sure the area around the equipment is adequately illuminated and is dry. Keep the area organized so there are no obstacles lying around on the floor. The surroundings sound be neat and clean.
	□ Workbenches set up near the equipment must be strong and sturdy and their surfaces treated with non-skid 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 main tenance.



□ 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 equipment.

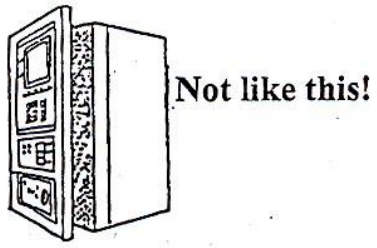
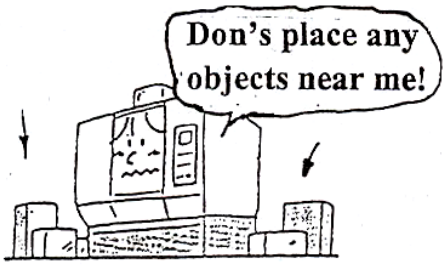
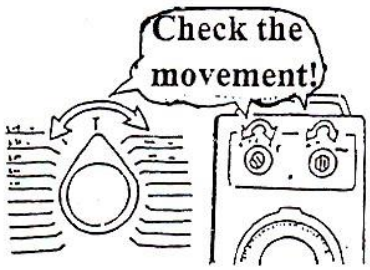
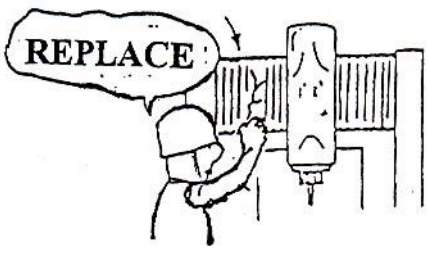
	□ Various safety covers (1) Head cover (2) Magazine cover (3) Splash guard
	□ Do not change the parameters of the stored stroke limits.
	□ push button switch for emergency stop.
	□ Over travel limit switches and dogs and dogs for X,Y, and Z axes.

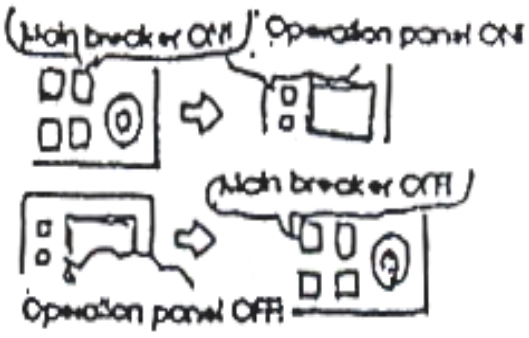
PRECAUTIONS REGARDING OPERATION

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.

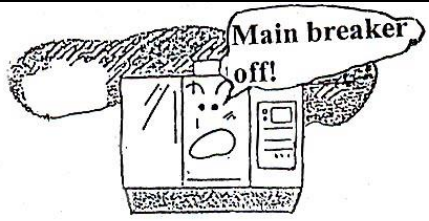


□ power supply

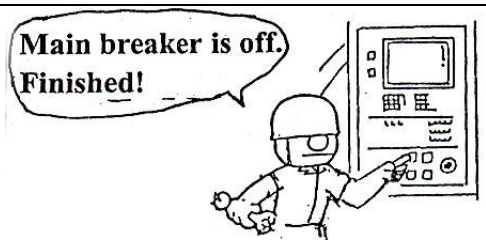
To turn on the power, first set the main break to "NO" and then the power supply switch on the operation panel to " NO" When turning off the power, first turn the power supply switch on the operation panel to "OFF" and then turn off the main breaker.

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

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

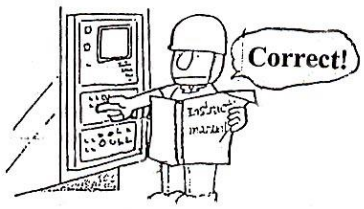


□ When the power is restored after a power failure, immediately turn the main breaker to "OFF" and then turn it back to "ON".



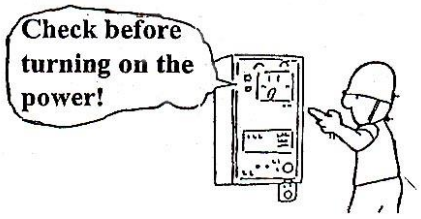
□ When operation is finished, turn off the main breaker if you are going to be away from the machine.

□ 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.



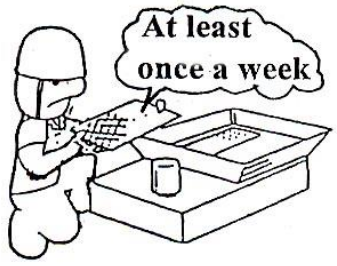
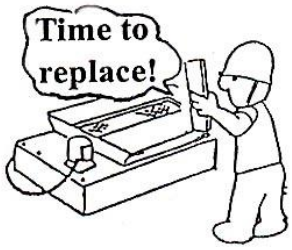
□ Before turning on the power, check the inspection items and operation items.

□ 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 reder 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

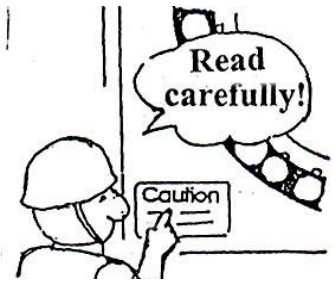
CAUTION

- 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.

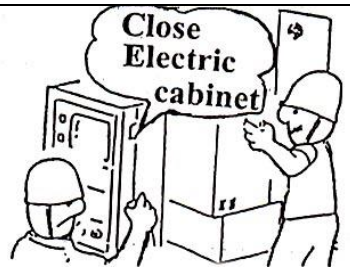
- Make sure there is a tool in the spindle when rotating the spindle.

PRECAUTIONS REGARDING MAINTENANCE

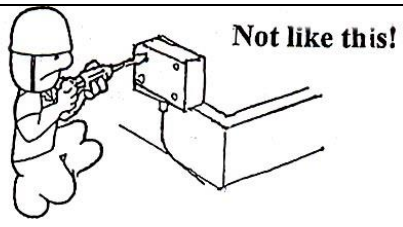


□ Operators or maintenance personnel should read the caution plates attached to the machine carefully and observe these cautions at all times. Be careful that caution plates do not get dirty, scratched, or detached from the machine. If caution plates become hard to read for any reason, please contact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

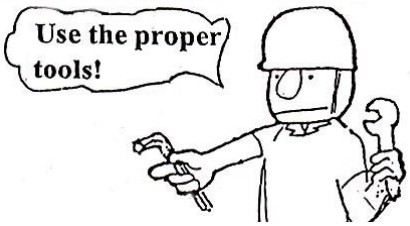
□ Before performing maintenance work on the machine, especially inside the splash guard or at the top or rear of the machine, shut off the power by first turning off the power switch on the control panel, then moving the main breaker on the power box to the "OFF" side. Check carefully to make sure everything 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.

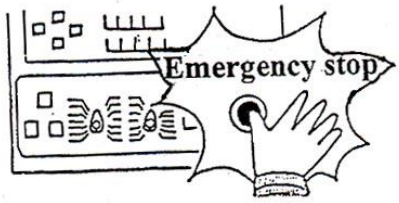
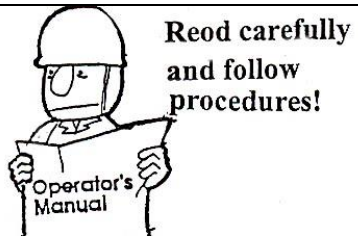
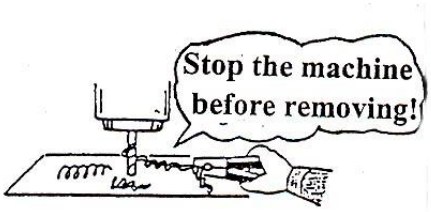
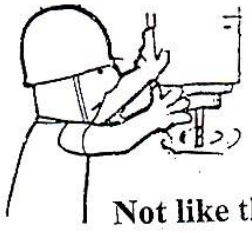
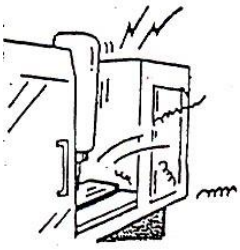


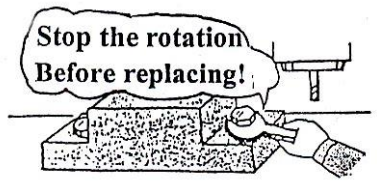
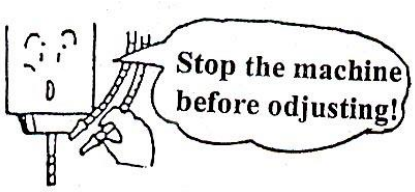
□ Never remove or modify the limit switches for stroke over travel of traveling axes, or the mechanism and electrical circuits installed for safety.



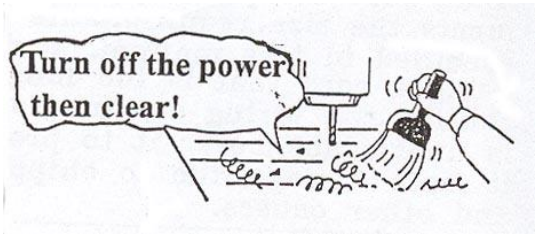
□ Use the specified spanners and wrenches for adjustments and repairs.

PERCAUTIONS REGARDING OPERATION

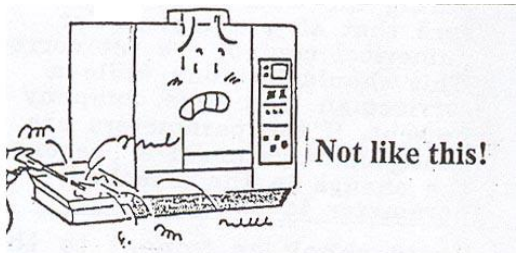
	□ Be completely familiar with the position of the Emergency Stop button so that you can press it instantly if necessary.
	□ Follow the procedures outlined in the manual to start up the equipment.
	□ When removing clippings that have adhered to tools have faller onto the work table, it is dangerous to 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.

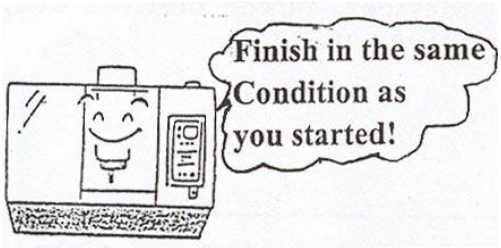
PRECAUTIONS WHEN WORK IS FINISHED



□ 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-souble cutting fluid, this is Particularly important.



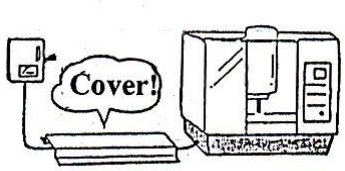
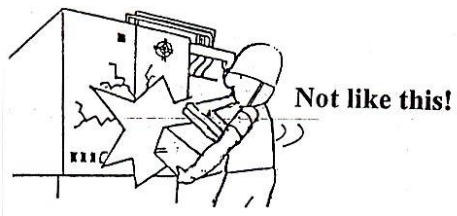
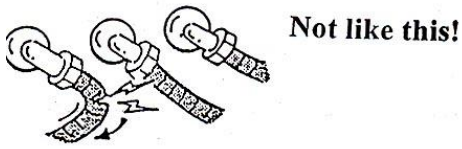
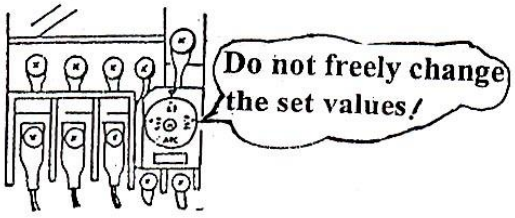
□ Do not use an air gun for cleaning the machine.

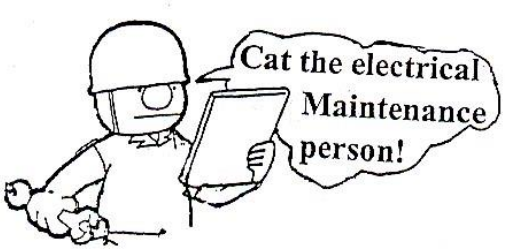
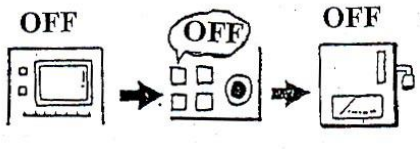
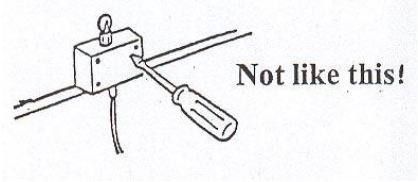
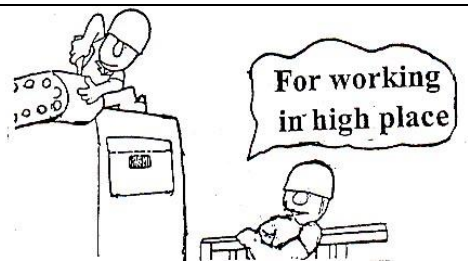
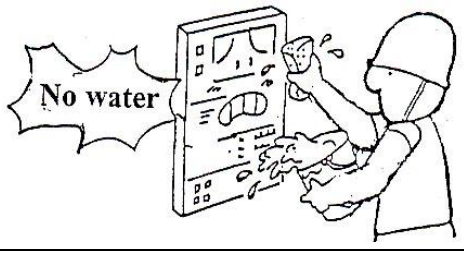


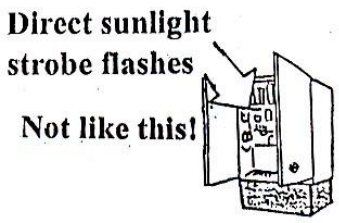
□ Check to make sure that each part is in the same condition it was in when operation was begun.

PRECAUTIONS REGARDING ELECTRICAL EQUIPMENT AND NC DEVICES

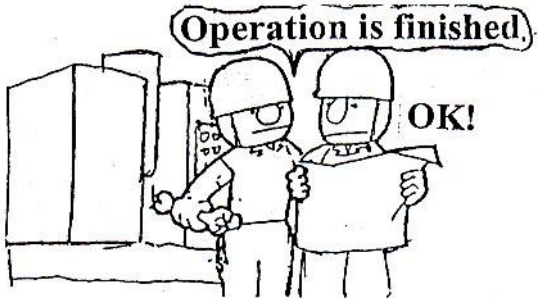
When handling electrical equipment or NC devices, please pay particular Attention to the following items.

	□ 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 overtravel 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 applies 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 centers is a high precis 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 MACHINE SPECIFICATIONS

SPECIFICATION \ MODEL		VMC 1050
Table working surface		1200mmx500mm
Longitudinal travel(X)		1050mm
Cross travel(Y)		500mm
Vertical travel(Z)		610mm
Spindle nose to table		100mm－710mm
Spindle center to column		550mm
Spindle taper		BT40
Spindle diameter		65mm
Spindle speed		8000rpm
Spindle motor		9/12 kw
X－Y－Z Rapid travers		36/36/20 m/min
Cutting feed		1~12000mm/min
Coolant pump motor		GRUNDFOS 2.1 HP(P:3.5Kg/cm;Q:100 L/mm
tool selection		Bi－direction random type.shortest path
No.of tools		24
Max. tool diameter (with adjacent tools)		ø75mm
Max. tool diameter (without adjacent tools)		ø150mm
Max.tool lenght		350mm
Max.tool weight		8kg
Table load capacity		800kg
Machine weight		6000kg
Floor space(LXW)		2920x3200mm
X－Y－Z Ballscrew dia.		ø40;ø40;ø40
cutting capacity CK45N	milling	100 cc/min
	drilling	ø30mm
	tapping	M30x3.5

Specificaions subject to change without prior notice

1- 2 MACHINE ACCESSORIES

STANDARD ACCESSORIES:

1. Coolant system
2. Spindle air blast
3. Auto lube with alarm
4. Halogen work lamp
5. Tools, tool box and various manuals
6. Screw type chip conveyor
7. Full enclosure splash guard
8. Levelling screws and pads

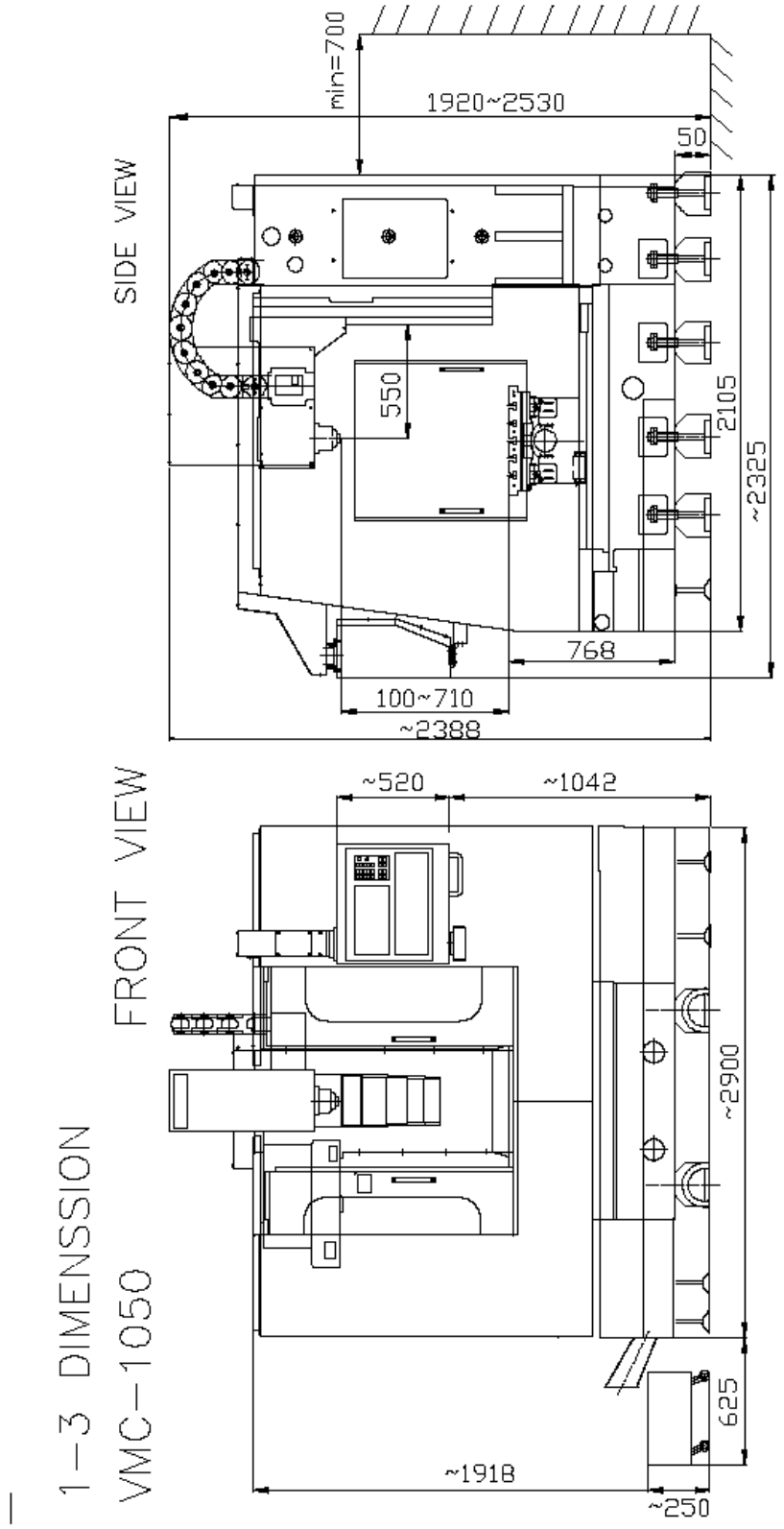
OPTIONAL ACCESSORIES:

1. Tool presetter (Renishaw)
2. CNC rotary table

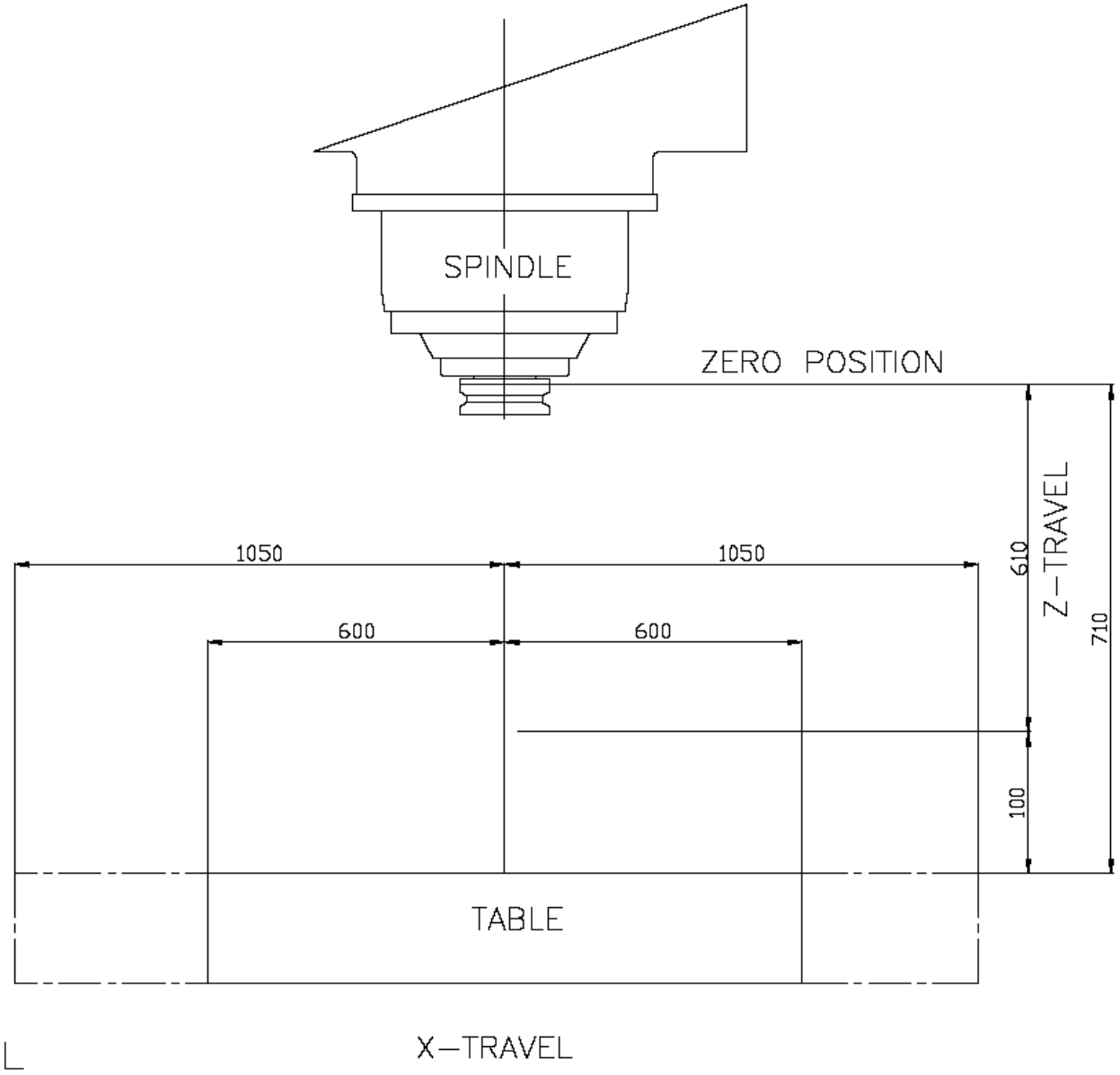
Note: Optional accessories in the table above varys depending on customers order.

1-3 DIMENSSION

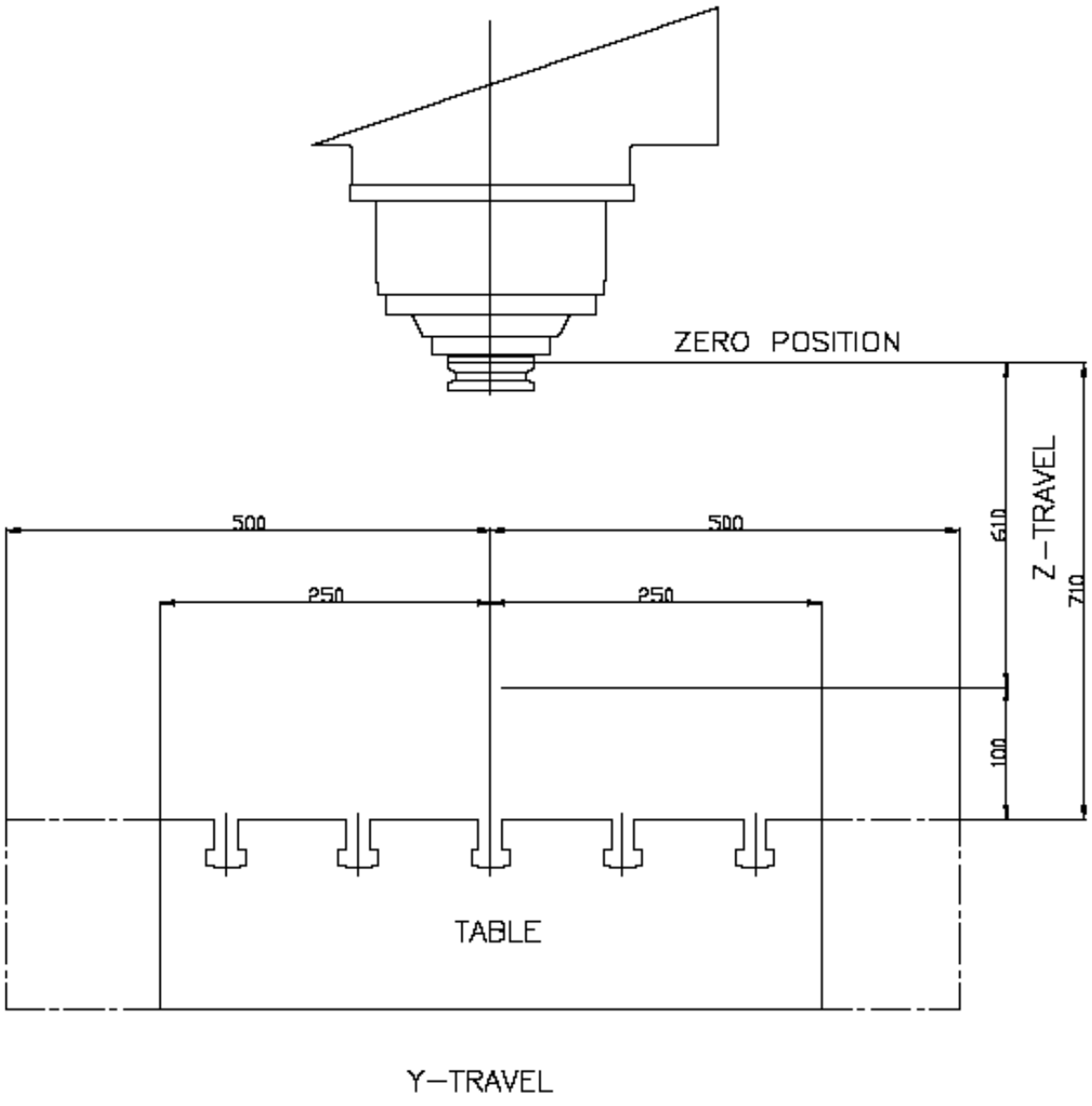
VMC-1050



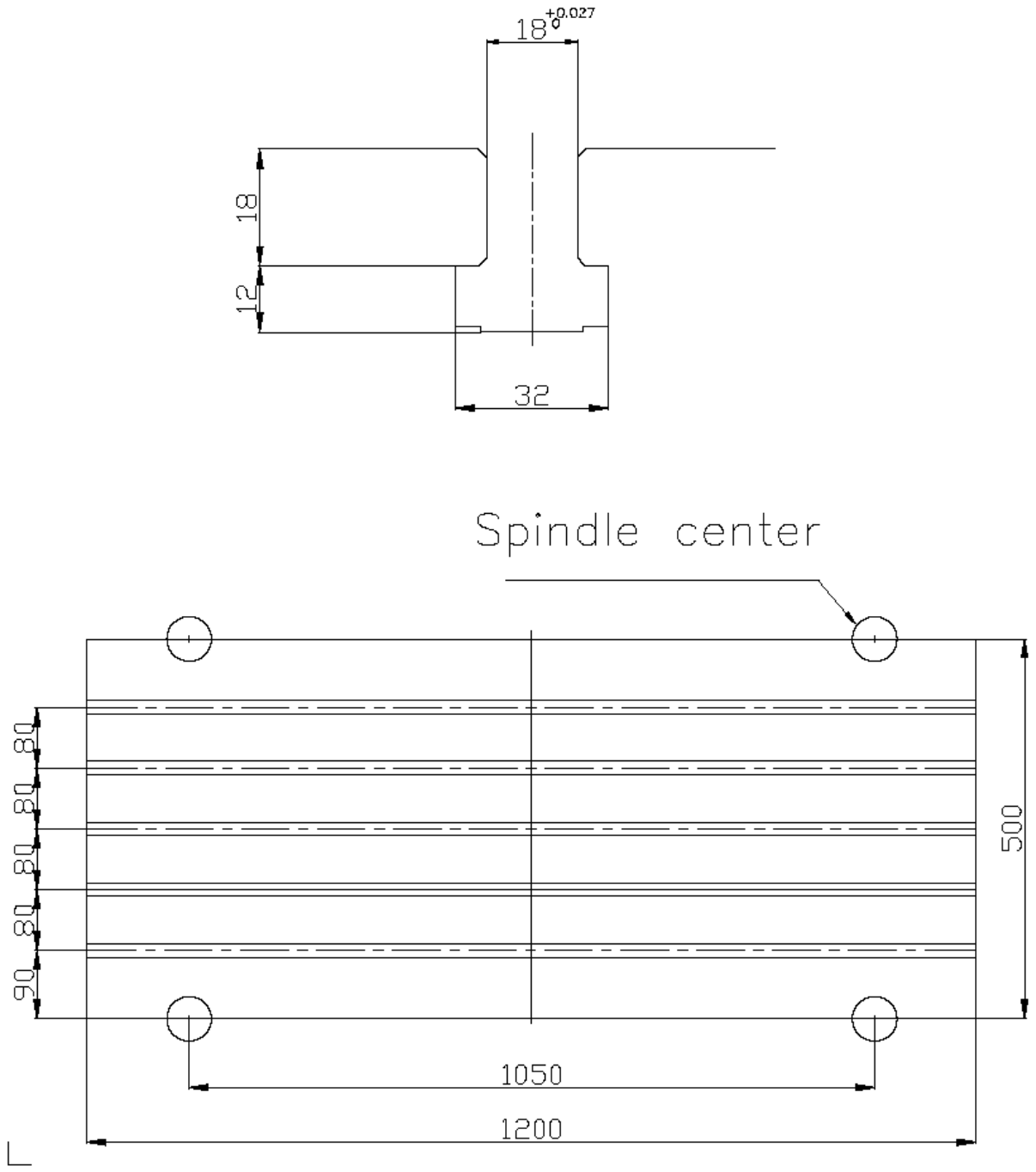
X–Z Axis Travel



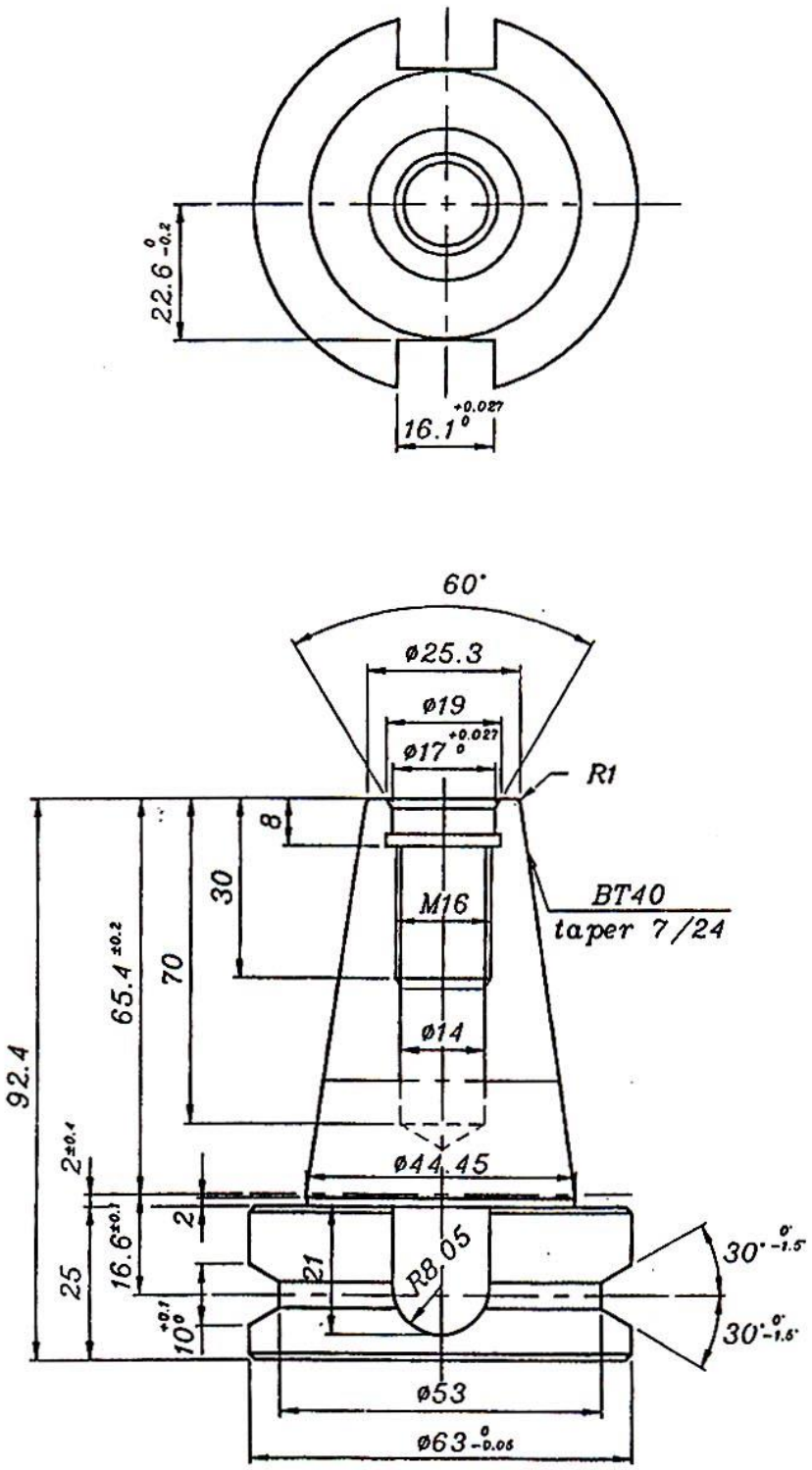
Y–Z Axis Travel



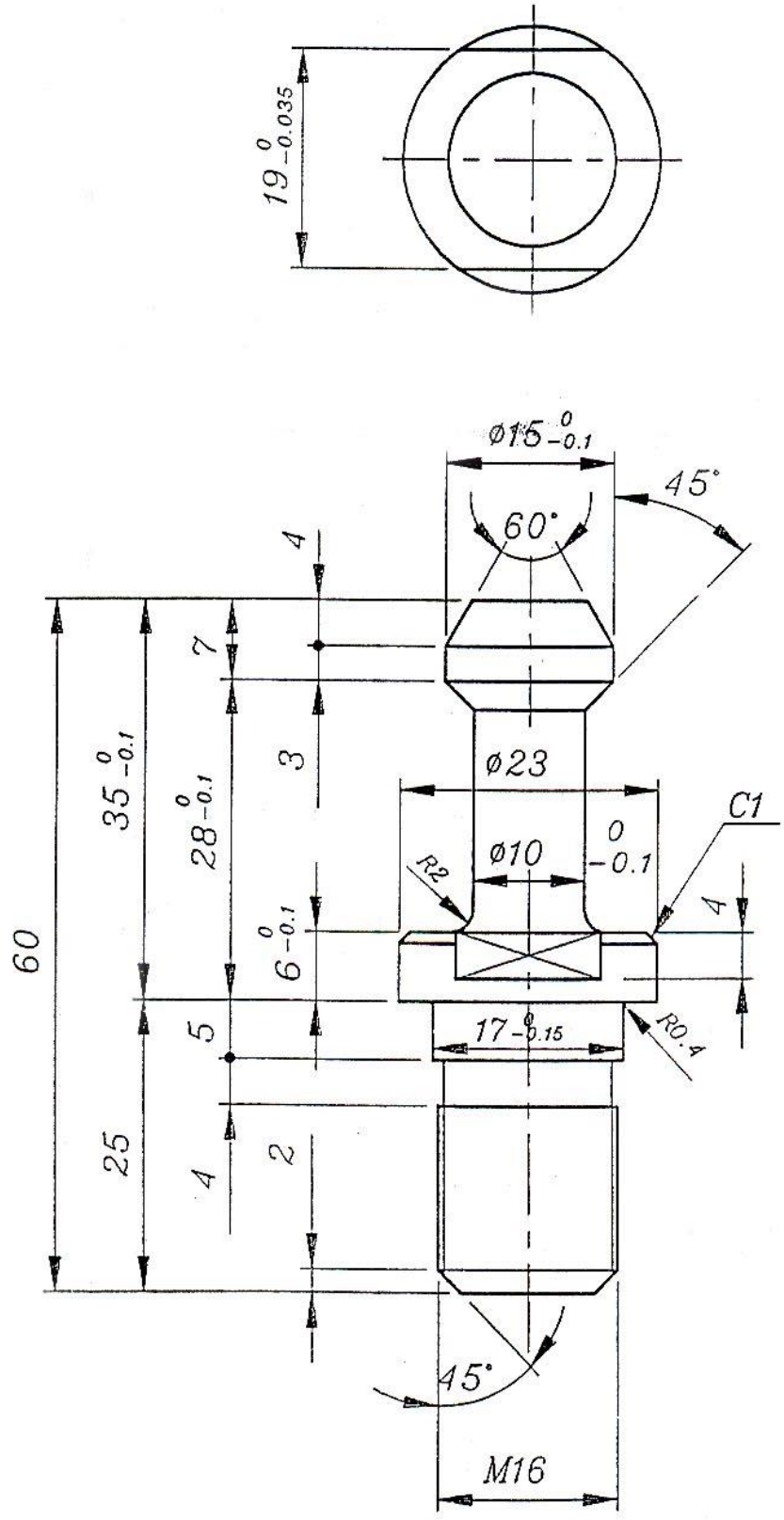
VMC 1050 Table & Slot



(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 10 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.

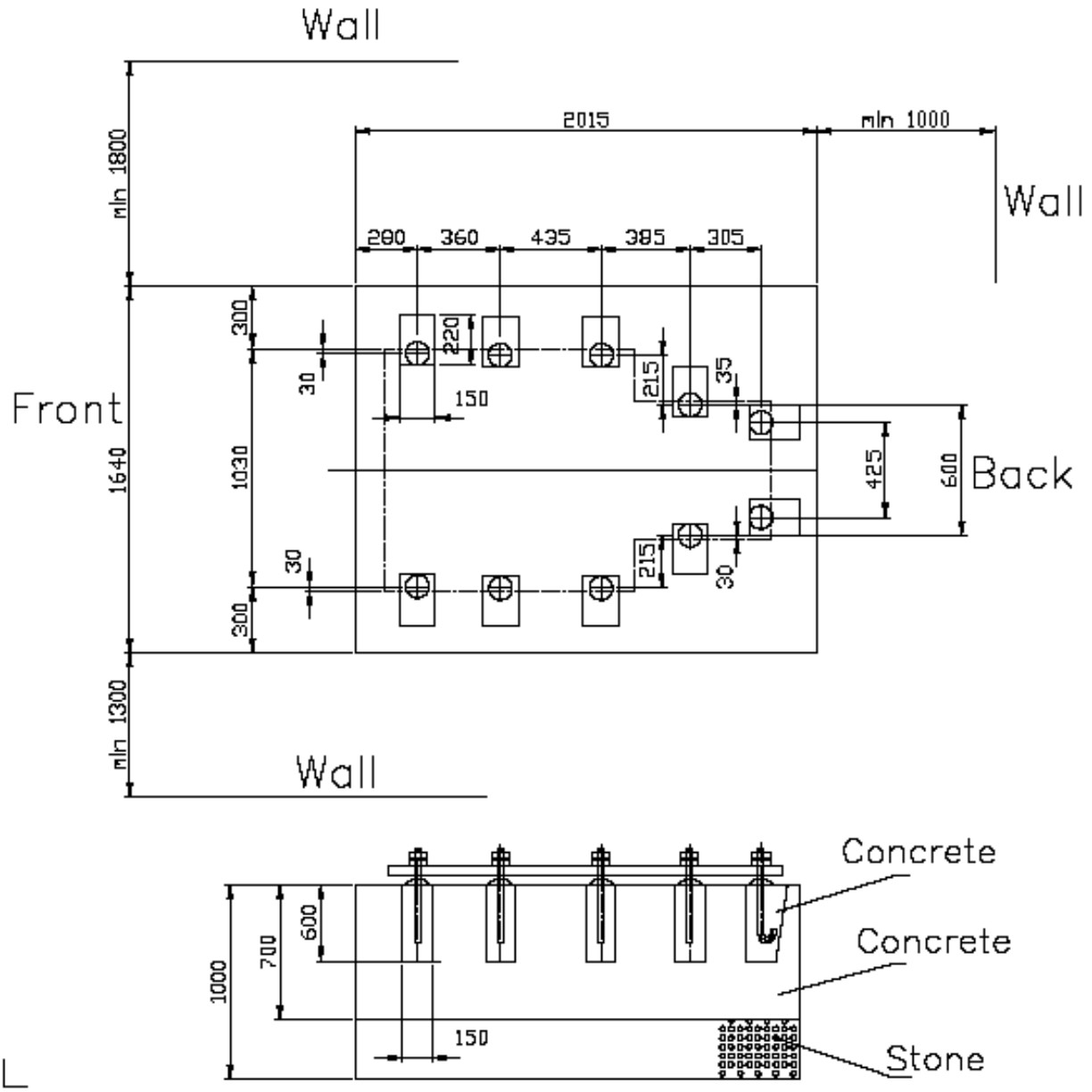
(7) When the machine reaches the destination and preparation is ready, lift up the machine and make J-type bolts of foundation through level adjusting blocks and adjusting screws. Then lock them with packing rings and nuts. Finally, put the machine on the floor slowly.

(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.

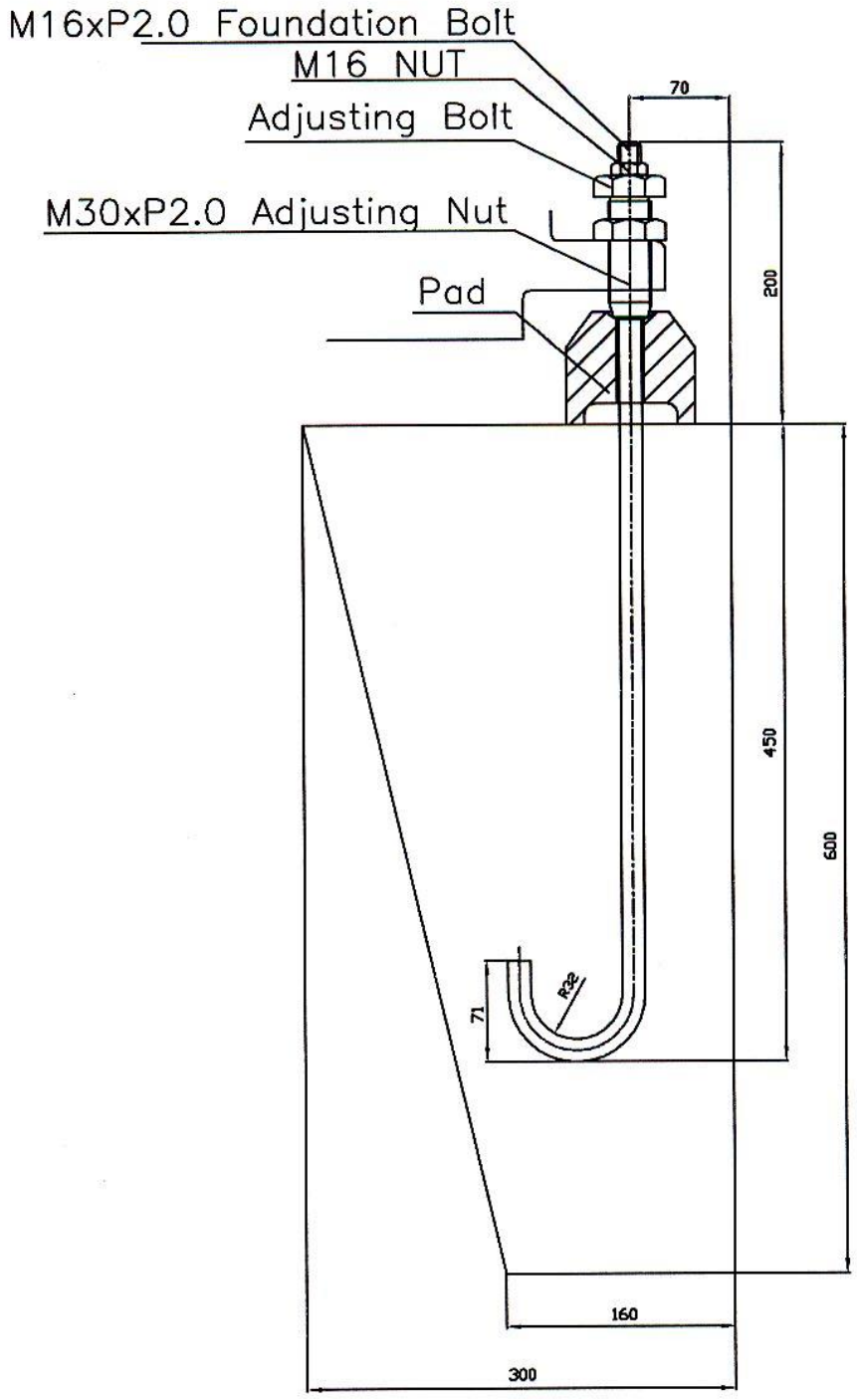
(9) After concrete gets dry, adjust the level of machine.

(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 1050 LGW Foundation



Foundation Boit



Flg.9

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:

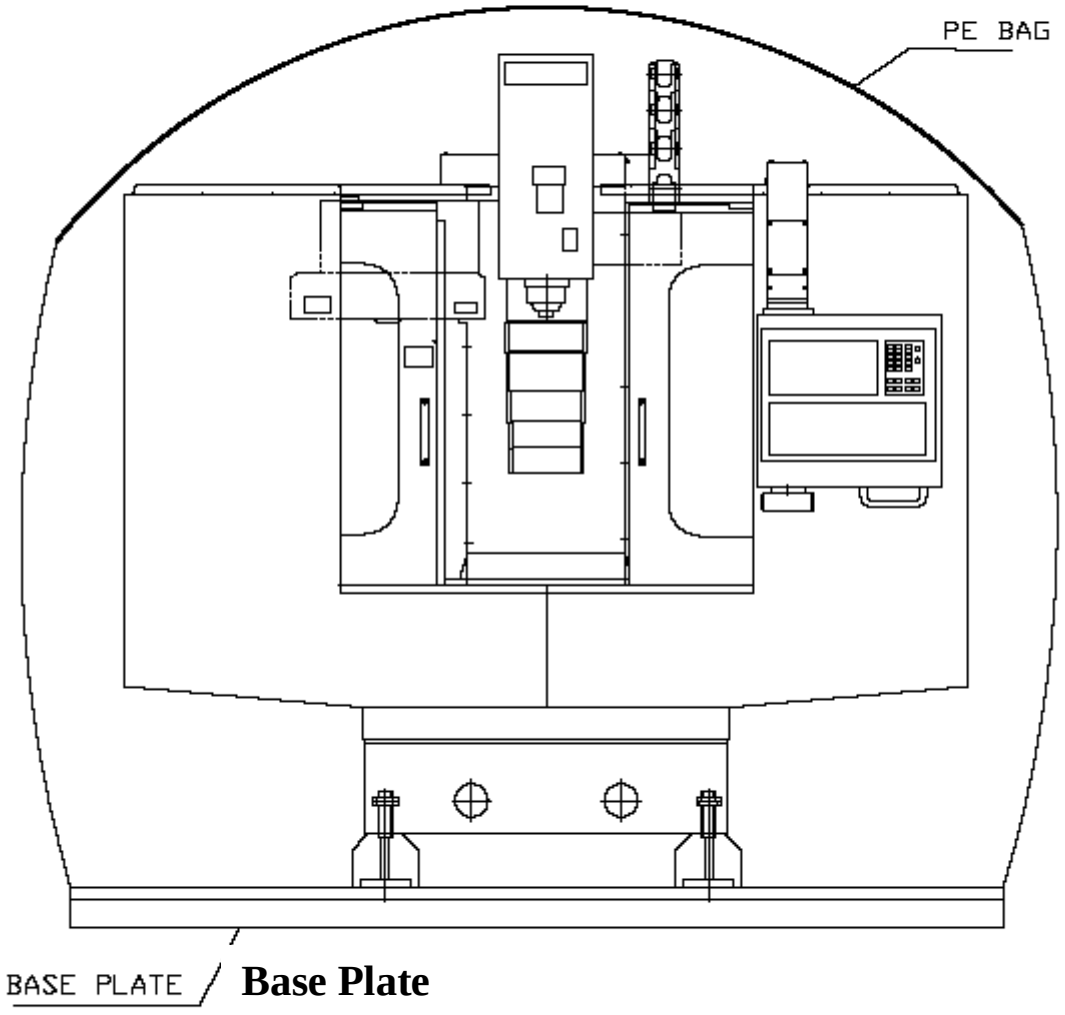
Fix the machine on the bottom plate and seal it with wooden boards. And take the measurements of water proof and leak proof. See fig. 11.

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.

PE Bag



Base Plate

Fig 10

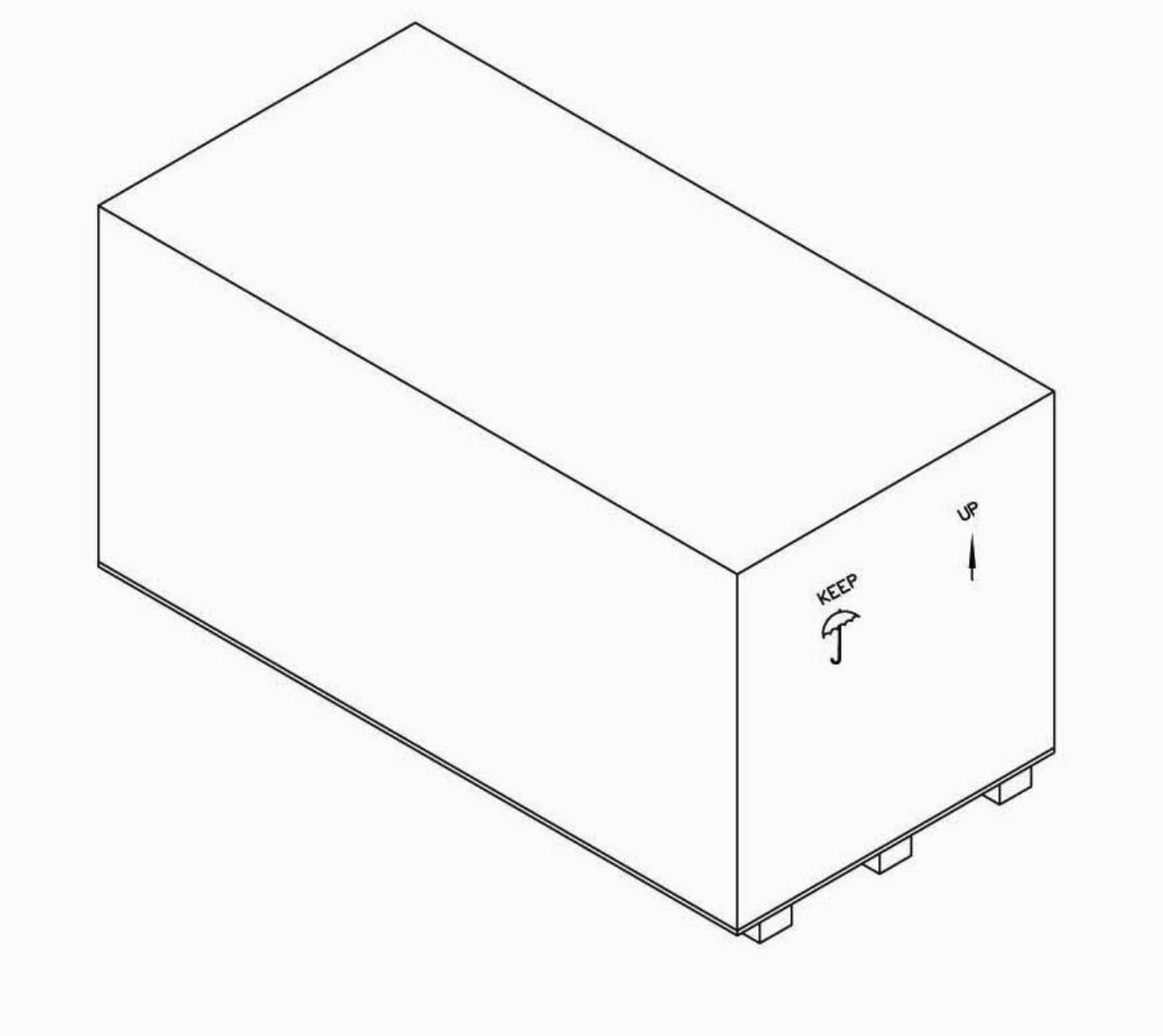


Fig. 11

FIXATION BEFORE TRANSPORT

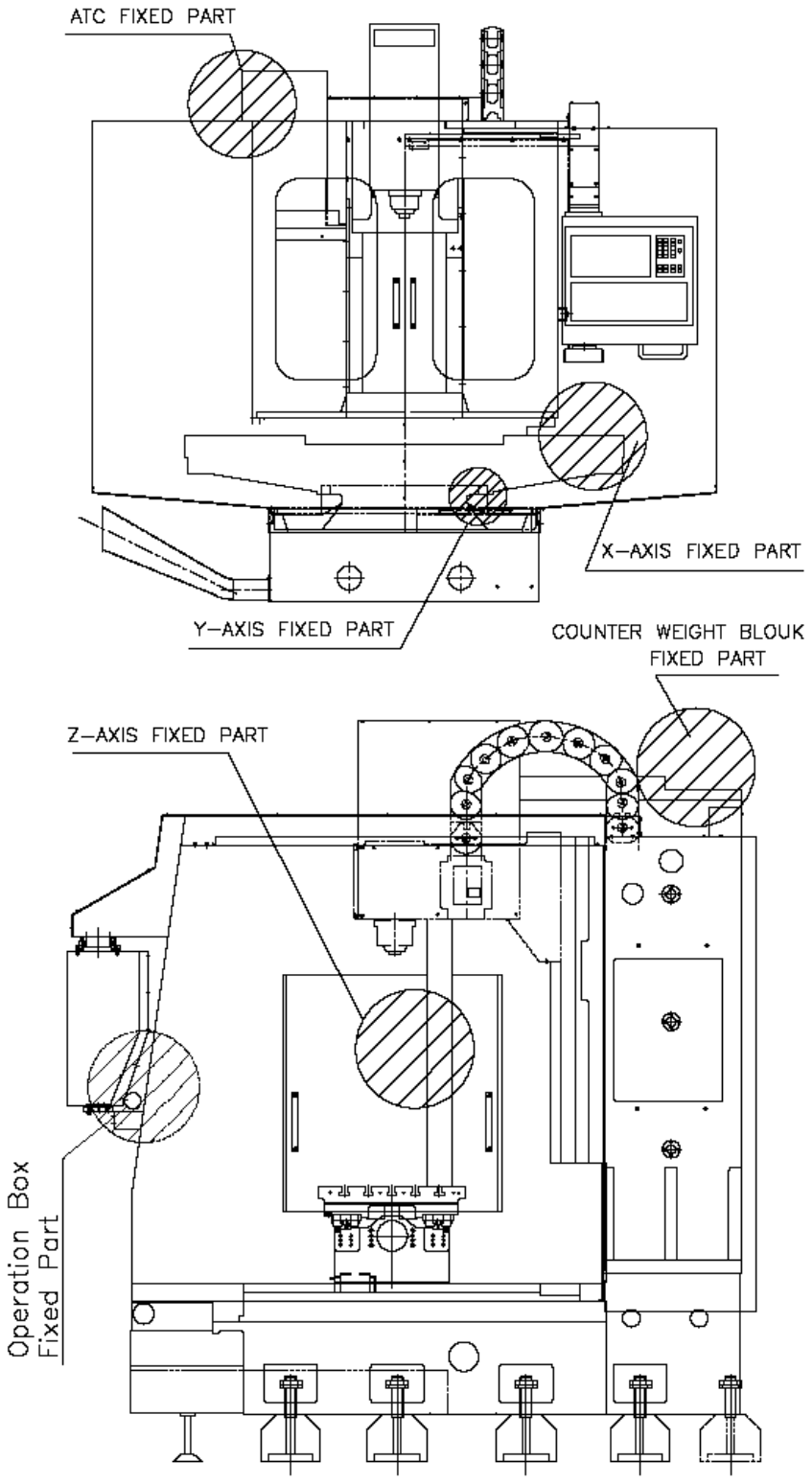


FIG.12

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 transporation way for avoid harming the machine and operators.

(3) The transporation 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 850, 5500Kgs.

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

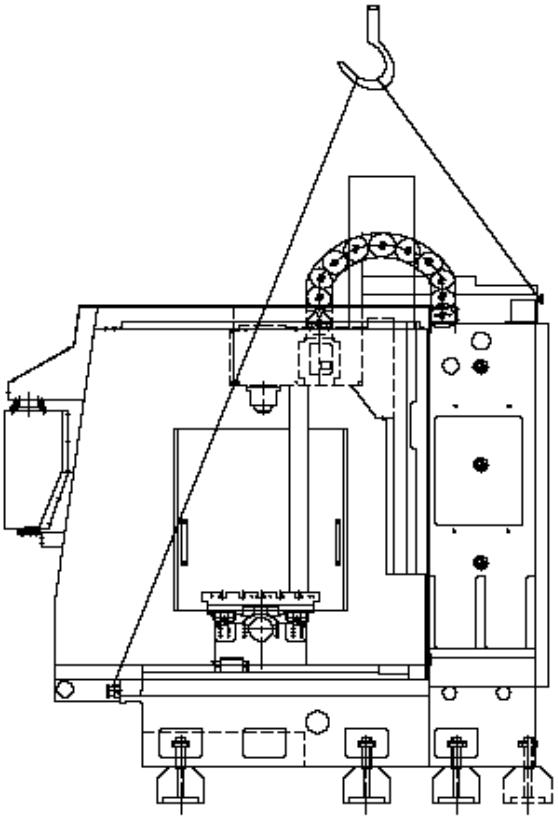
(5) The machine consists of spindle housing, column, table, saddle, base seat, eleatrial box, and ATC mechanism accessories. So be sure to fix all parts during transporation to avoid harming the precision, owing to up & down vibration or big vibration.

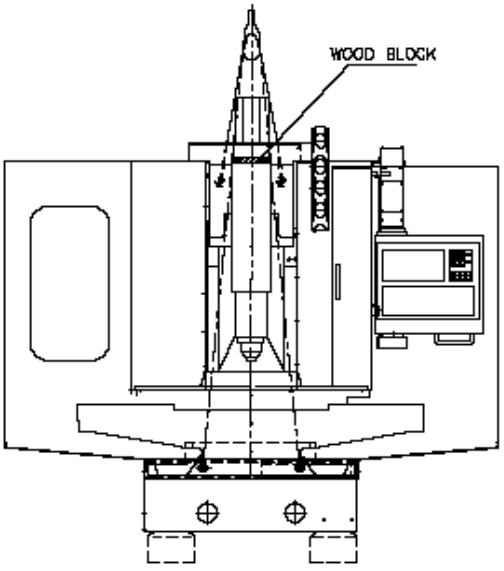
Positioning of Machine

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.

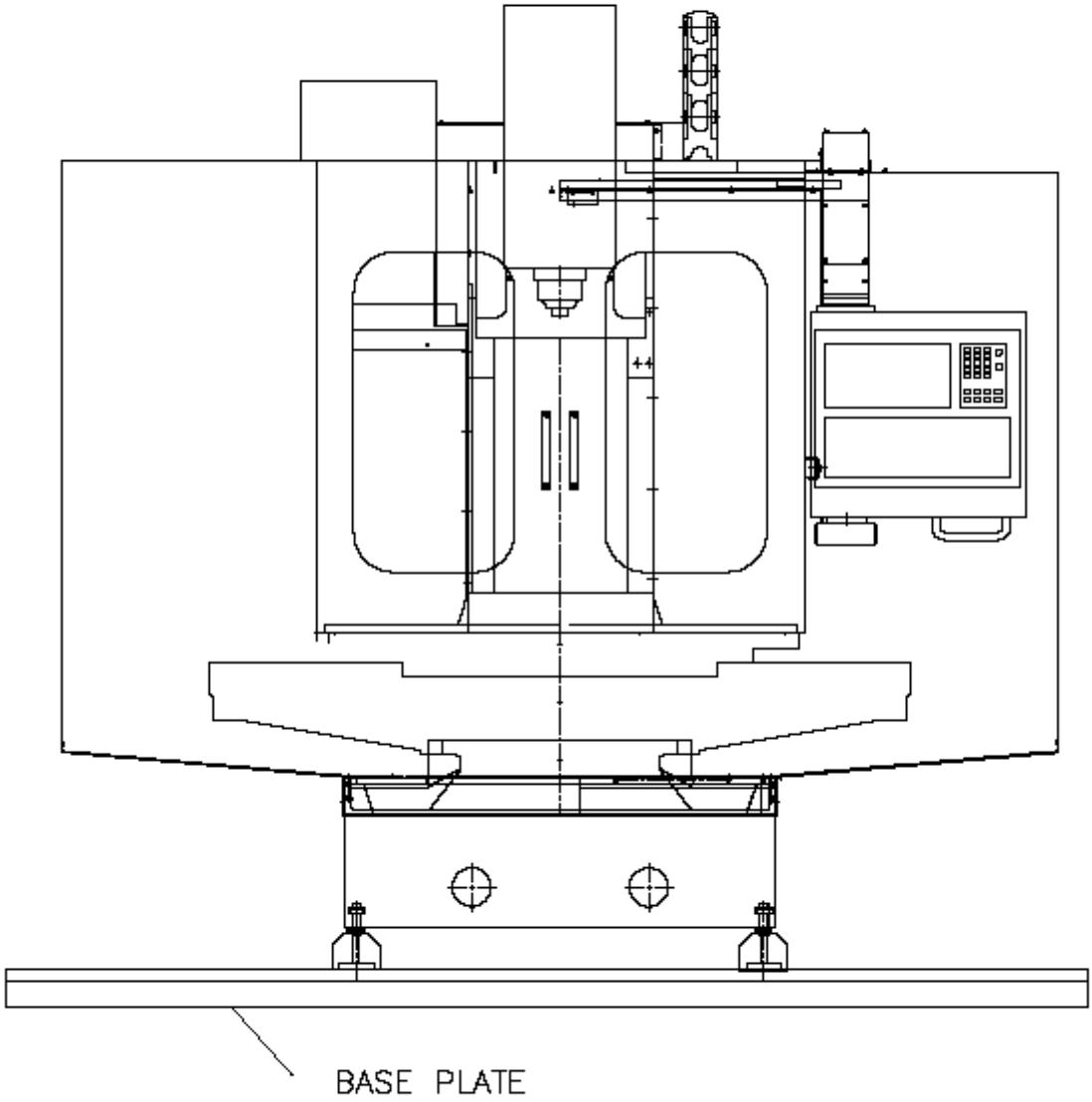
By Crane

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





MACHINE TRANSPORTATION



5. NOTES FOR CONFIRMATION BEFORE STARTING MACHINE

5-1 Power Requirements

Power requirements are as follows:

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

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.

Note3-For machines with APCorNC rotary table,air pressure at the secondary side should be kept constant at 5 kgf/cm2(71psi) using the pressure regulator on the machine.

Lubricating oil

Tank	Oil Type	Amount
Lubricating oil tank	1) Esso spinesso 22	(0.5 gal)

.

Note 1: 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:

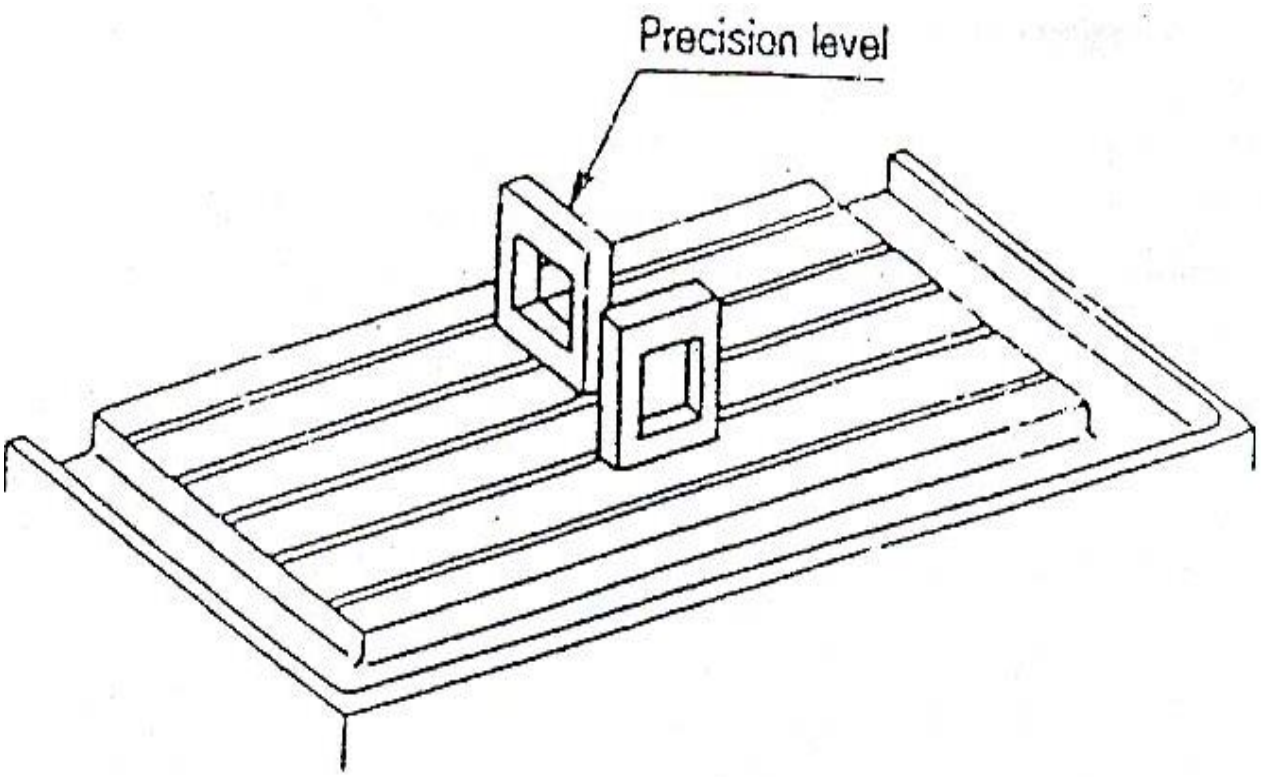
(1) Position the spindlehead at the center of vertical travel (Z-axis).

(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).

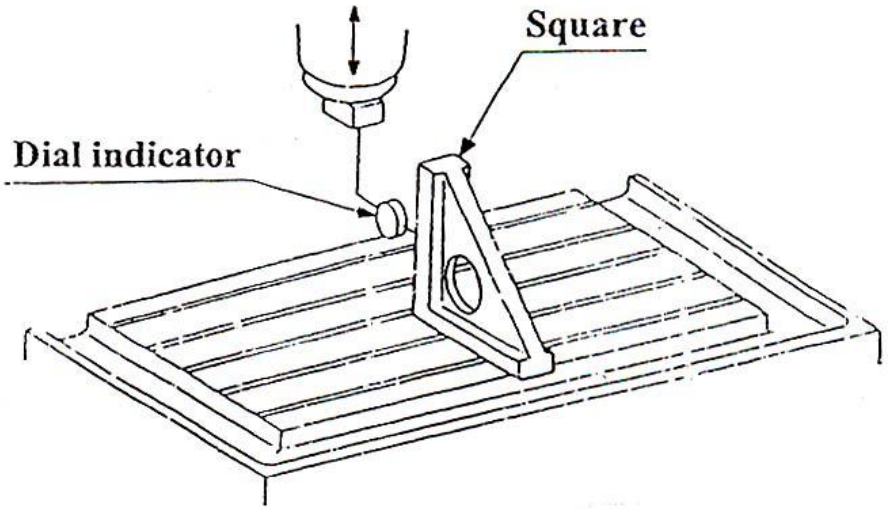
(4) With the saddle level placed near the center of the table along the X- and Y-axis directions, slowly move the table over the full range of both X and Y axis and take readings.

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



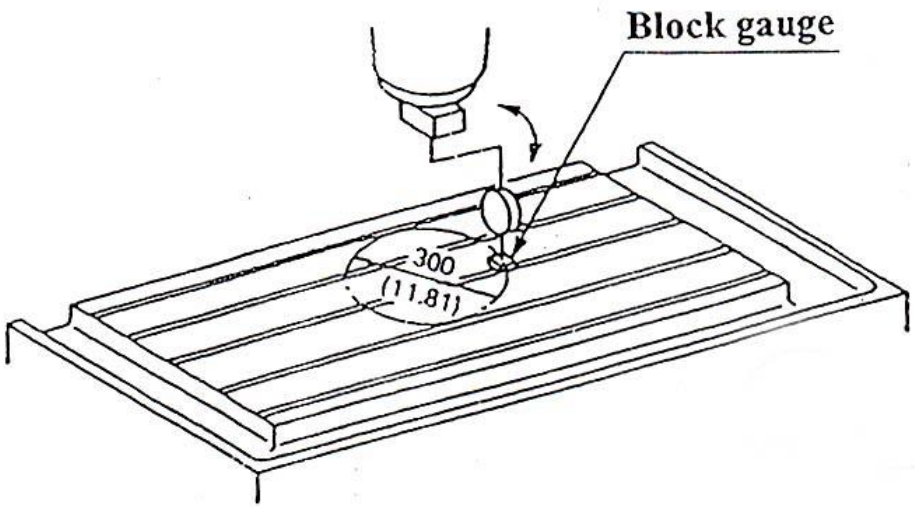
(5) Place a standard test spare on the table, attach a dial indicator to the spindle, and measure the vertical movement (Z-axis) of the spindle head with respect to the X-, Y-, and Z-axis directions.

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 procedur.

5-3 For raising working effect and maintaining the quality & preciseoit 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.

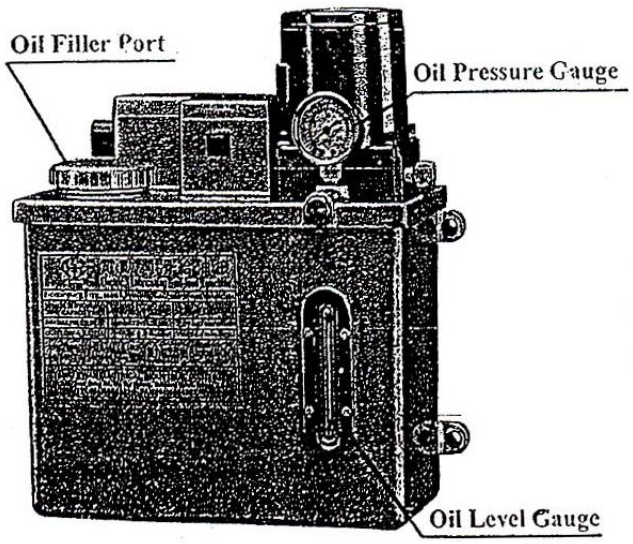
5-4-2 Centralized Lubrication Unit

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 head stock, the saddle and the table.

Electric Lubricating oil-feed Machine:



FEATURES:
Under the principle of designing easy operation,
it uses special ext. & int. gears for wear-resistant, has small noise of starting, oil-suction power strong, and sets the pressure pertectinstallment, it can be coordinated with the whole design of machine & PC circuit, also can be effective for lubricating points of each machine's construction, and can give play to the function of forced oil-feed.

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 operator 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 quide ways and result in machine trouble.

5-4-5 Lubrication Warning System (Alarm)

Poor lubrication affects machine accuracy and causes breakd owns. 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

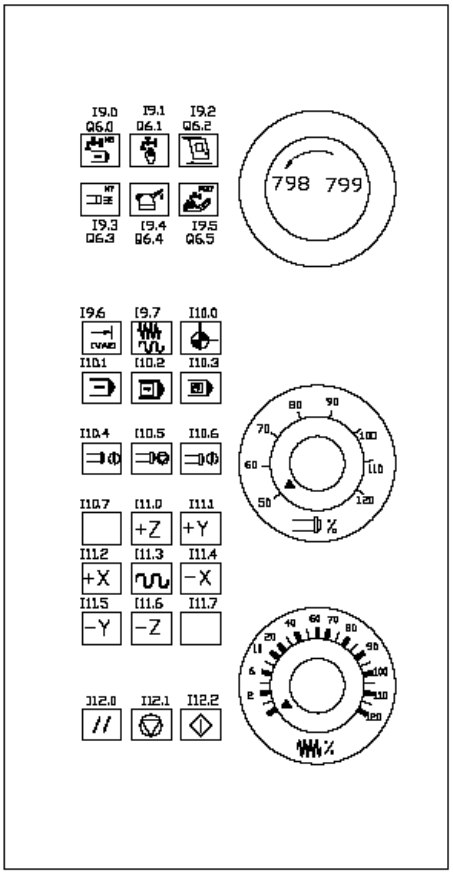
A pressure switch is used to detect pump output pressure. If the pressure does not rise after the pump has been termed on, an alarm is displayed oil the CRT.

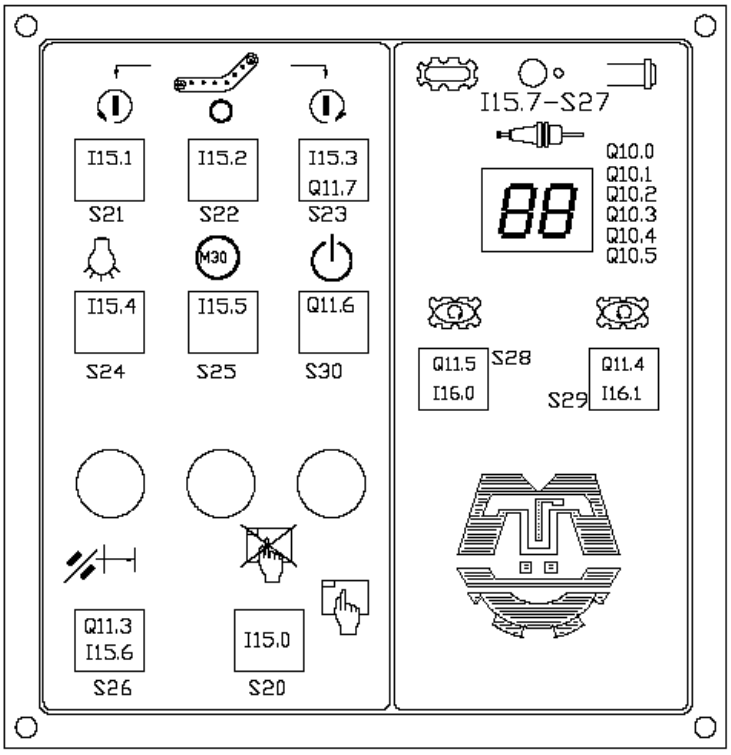
(3) Tripping of the Overload Protective Relay of the Centralized Lubrication System Pump.

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 3 alarms occurs, the alarm type is displayed on the CRT with an alarm code.

III. DESCRIPTON OF OPERATION


I9.0
Q6.0
I9.1
Q6.1
I9.2
Q6.2
798 799
I9.3
Q6.3
I9.4
Q6.4
I9.5
Q6.5
I9.6
I9.7
I10.0
I10.1
I10.2
I10.3
I10.4
I10.5
I10.6
I10.7
I11.0
+Z
I11.1
+Y
I11.2
+X
I11.3
I11.4
-X
I11.5
-Y
I11.6
-Z
I11.7
I12.0
I12.1
I12.2

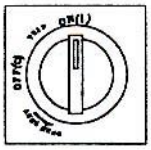

I15.1
S21
I15.2
S22
I15.3
Q11.7
S23
M30
I15.4
S24
I15.5
S25
Q11.6
S30
Q11.3
I15.6
S26
I15.0
S20
I15.7-S27
Q10.0
Q10.1
Q10.2
Q10.3
Q10.4
Q10.5
Q11.5
I16.0
S28
S29
Q11.4
I16.1

4

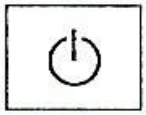
OPERATION MANUAL

1- POWER ORERATION

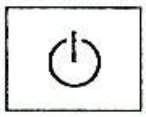
1-1 POWER ON



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

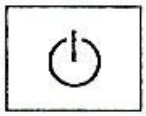


2. Depress NC ON push button again the power of control system will start and the green lamp must be extinguish.



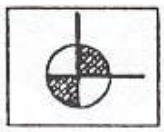
3. Wait for the completion of starting up. The NC ON green lamp must be flashed.

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. Select " " (REF) MODE.



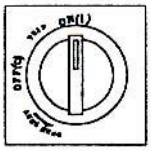
Execute MANUAL REF RETURN

(REF: 3-1) having the machine ready for operation.

1-2- POWER OFF

1. Make sure machine was in safety situation

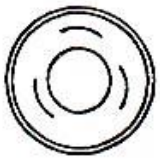
2. Depress "EMERGENCY STOP" push button to stop Power system and all driving mechanism.



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

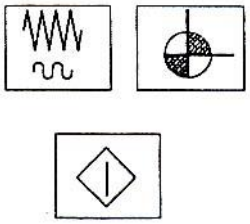


When an emergency situation was happening, depressing "EMERGENCY STOP" push button could stop all movements of machine to secure the safety of operator
and machine. When it was depressed:

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. RETURN TO REFERENCE POSITION



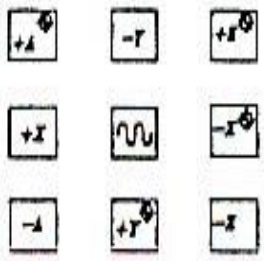
1. Set MODE selection switch to "  ".

2. Depress CYCLE START push button will automatically execute RETURN TO REFERENCE POSITION. X and Y axes position returning would be executing after Z

axis return to its reference point.

3. a) Depress "+Z "will return to original point of Z axis.

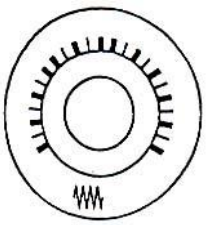
b) Depress "-X" will return to original point of X axis.



c) Depress "+Y" will return to original point of Y axis.

d) Depress "+A "will return to original point of A axis.(option)

4. If the machine was at a position too close to it's reference position, it is suggested to it's opposite a little further before executing ZRN.



6. The speed of RETURN TO REFERENCE POINT can be controlled through " JOG override"

7. To stop returning to reference point:

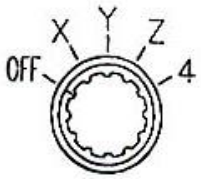
a) Depress " RESET " push button.

b) Turn MODE switch to other mode.

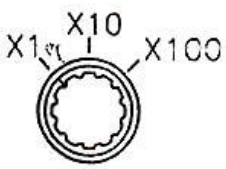
NOTE : After turned on the machine or depressed the EMERGENCY STOP push button, have to do the RETURN TO REFERENCE POINT once, since there Might be a slip on any one of the axes.

3-2 HANDLE FEED

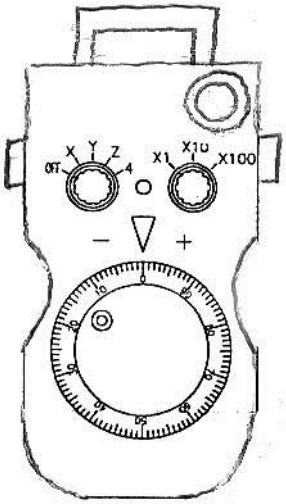
1. Depress " " MODE selection button On MCP Panel.



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



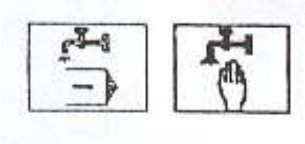
3. Select "Multiply Factor" selection switch on the handle wheel to desired position, X1 (0.001mm/scale), x10 (0.01mm /scale) or x100 (0.1mm/scale).



4- Push and hold two enable button simultaneously

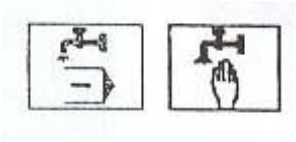
5. Table will move to the suitable position according to speed scale factor of MANUAL PULSE GENERATOR turning direction.

3-3 COOLANT

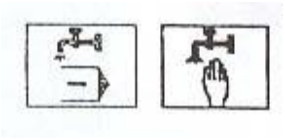


1. Depress once, coolant ON (indicator lits up).

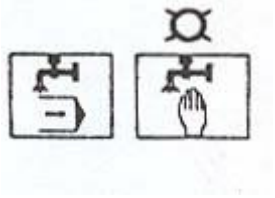
Depress again, coolant OFF (indicator off)



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



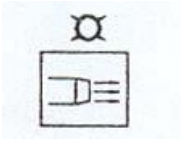
b) Depress  again will terminate M08 command and indicator in it will OFF. In this state, the coolant is not supplied even if M08 is executed.



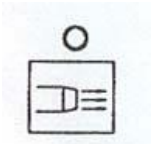
3. When the coolant is supplied through the nozzles, the indicator lits up.

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

3-4 AIR BLAST

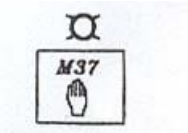


1. Depress once, air blast ON (indicator lits up). (M07)



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

3-5-2- CHIP CLEAN (FLUSH CHIP):



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

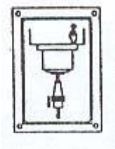
2. Depress again, chip clean OFF(indicator off),(M38)

3-7 MAGAZINE CW AND MAGAZINE CCW PUSH BUTTON

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

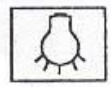
MAGAZINE CCW: Under JOG mode, push this button will rotate the tool magazine counterclockwise.

3-7-1 TOOL UNCLAMP



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

3-8 WORK LIGHT



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

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

3-9- 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.

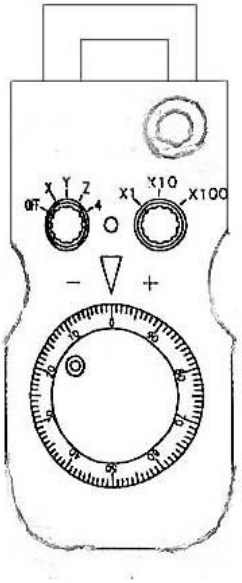
O.T

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

2. When overtravel happening

O.T

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



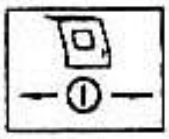
b). Depress power push button. And // Reset key.

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

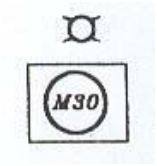
3-10 AUTO DOOR (OPEN DOOR)



Controlling door openning 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.

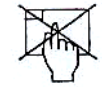
3-11 AUTOMATIC POWER OFF FUNCTION



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.

3-12 PROGRAM PROTECTION KEY

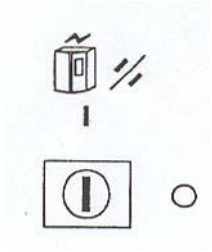


If this key switch turn to "  "(OFF).

The edit operation is exhibited.

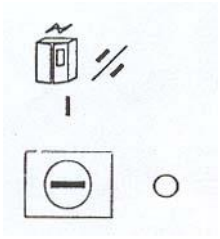
4. OTHER SWITCHES

4.1.1. ELECTRICAL CABINET APO



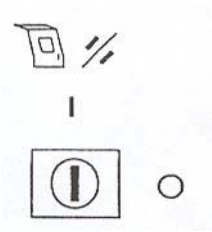
1. Electrical cabinet auto power off setting.

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



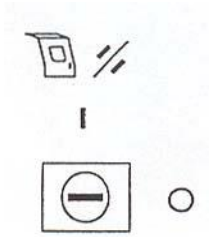
3. OFF: When cabinet door being opened, AUTO POWER OFF will still turn on power for repairing machine. It should not be used in normal condition.

4-1-2 DOOR INTERLOCK



1. Door interlock setting key.

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



3. OFF: Door interlock uneffective. Door can be openned. 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 equiped with magnetical 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:

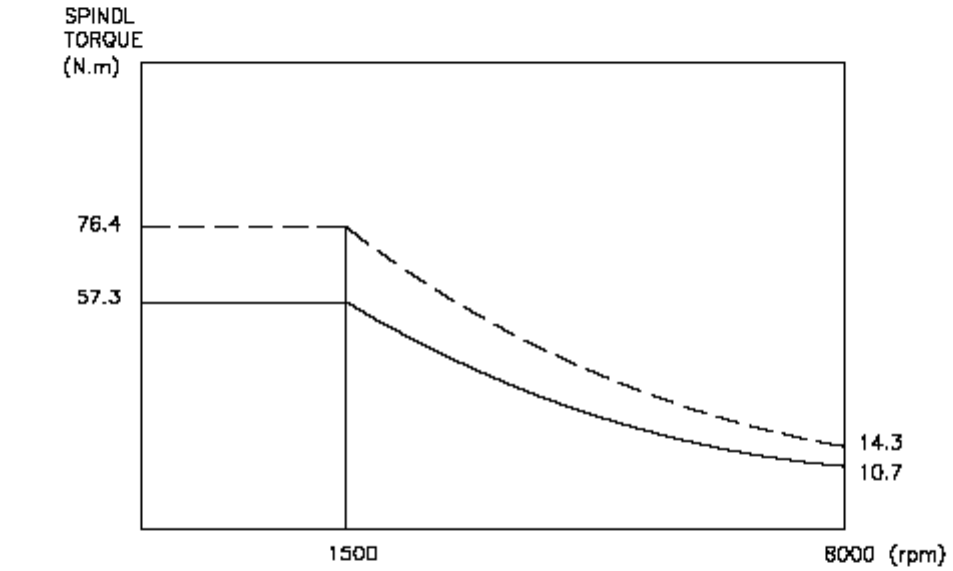
(1) Spindle speed is limited below 50 rpm.(PAR.35160)

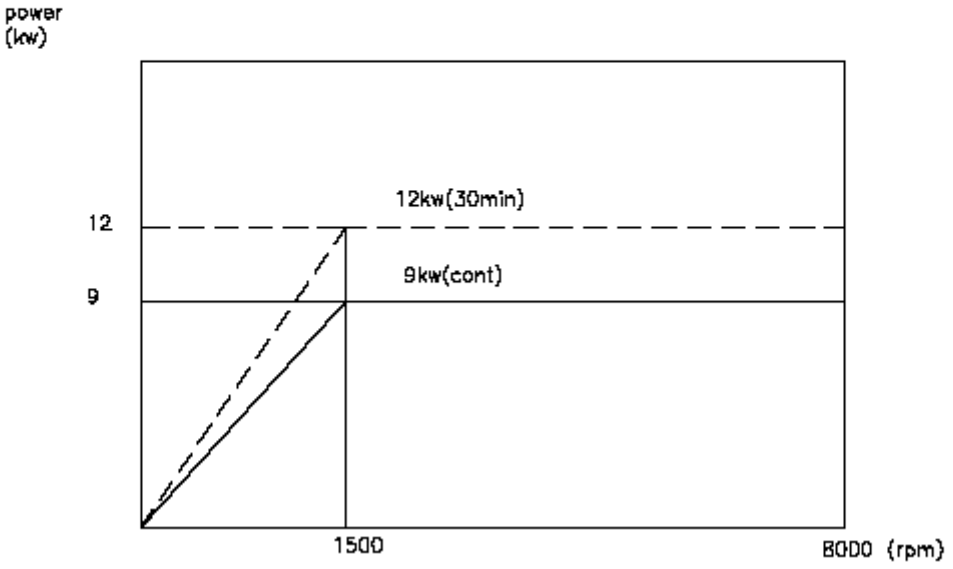
(2) Axial movement feederate is limited 80%

IV. MAINTENANCE

1: TORQUE CHART (BT-40)

For 8000 rpm
Siemens ac spindle motor 1pH7107
T=57.3 NM
Rated speed 1500 RPM
MAX speed 9000 RPM
pulley ratio=1:1





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- EveryHalf-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.

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 centraizedly lubricated include table, saddle, slide surface of spindle housing, X-Y-Z axis ball screws.

Manual Lubrication:

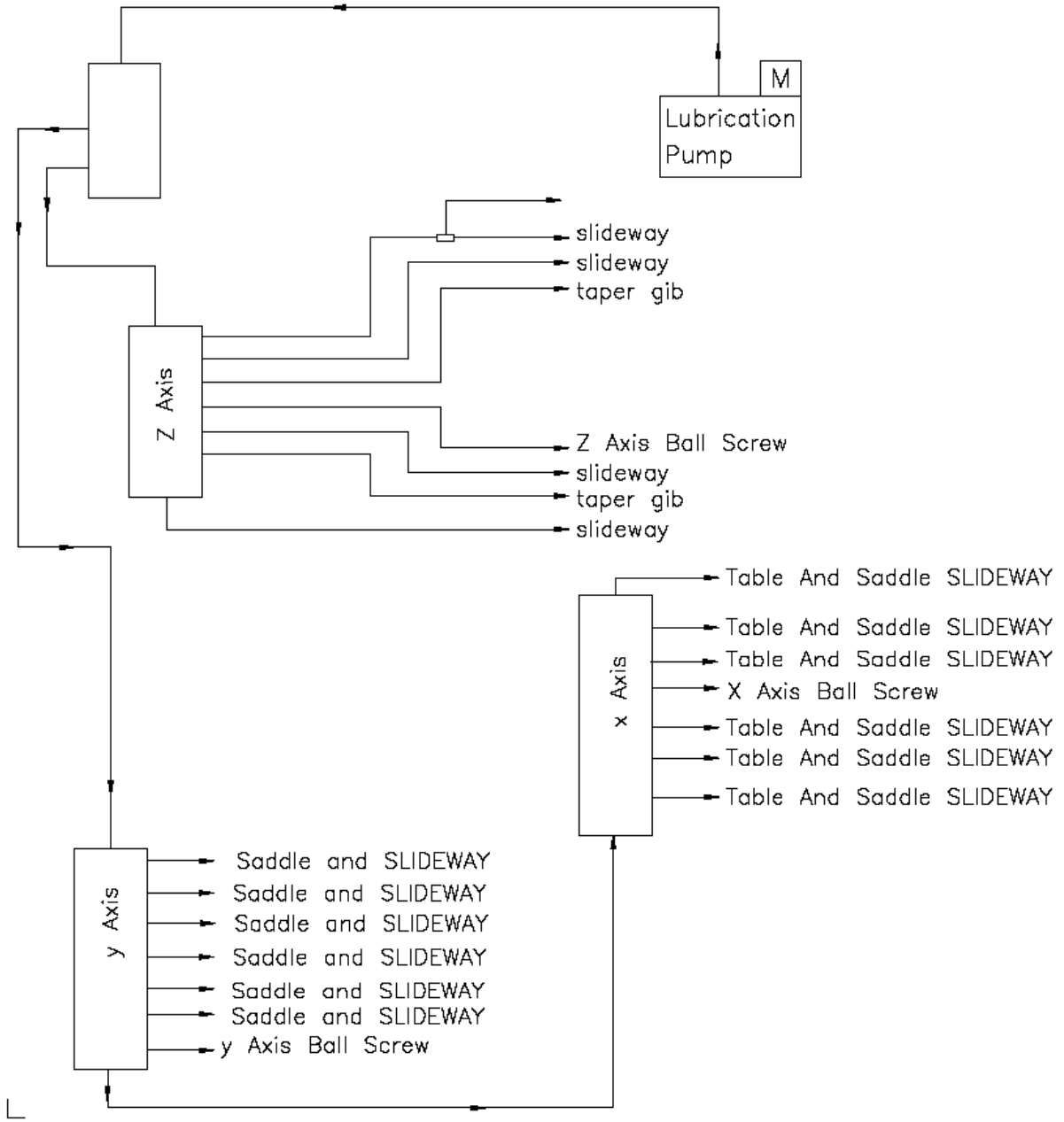
It's for the places which are not easily lubricated or don't need

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.

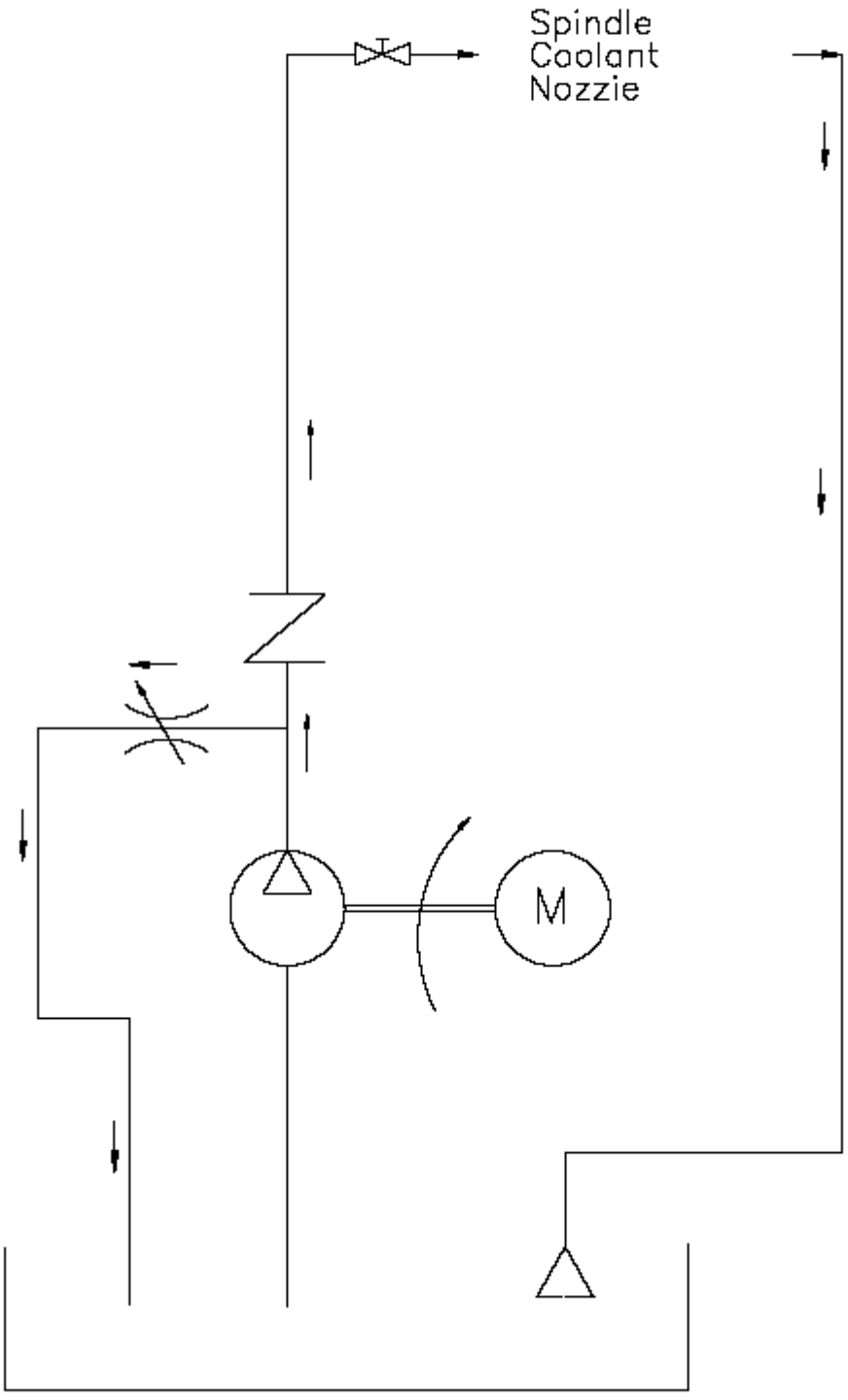
3.1 List of Lubricating oil

Oiling position					
ITEM	1	2	3	4	5
LUBRICATING POSITION	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	150L	0.3L	Proper amount	Proper amount
LUBRICATING WAY	Centralized lubrication	Circulating oiling	Air atomizing oiling	Manual grease lubrication	Manual oiling
OIL REPLACING PERIOD	Usually keep Over oil level	Yearly replacement	Usually keep over oil level	Every half a year maintenance	Yearly replacement
OIL'S FEATURE	1) Viscosity: ISOVG68 2) Viscosity index 3) Wear resistance And pressure Resistance 4) Rust proof Anti -bubble Anti-oxidation	1) Large heat transfer 2) 2) Good lubricating property	1) Viscosity: ISOVG32 2) Viscosity index is over 95 3) Rust proof . Anti-bubble Anti-oxidation	Grease	1) Viscosity: ISOVG32. 2) Viscosity index is over 95 3) Rust proof. Anti-bubble Anti-oxidation Anti-emulsification
OIL RECOMMENDED	1) Mobil Volocite Oil .2. 2) Esso Febise K68- 3) Shell Tonna T68. 4) chevron way Lubricant 68 5)Behran k68	1)Esso pennex 47. 2) Shell Dromus B.	1) Mobil DTE oil 26. 2) Shell Tellus 32. 3) Esso Nuto H32 4)Behran 32	1) Esso Beacon 2) Shell Alvania R-2.	1) Mobil DTE oil 26 2) Esso Nuto H32 3) Shell Tellus 32. 4)Behran 32
OONTAINER'S POSITION	In the pneumatic Box	At the Cutting Water tank	At the column Left-Side		

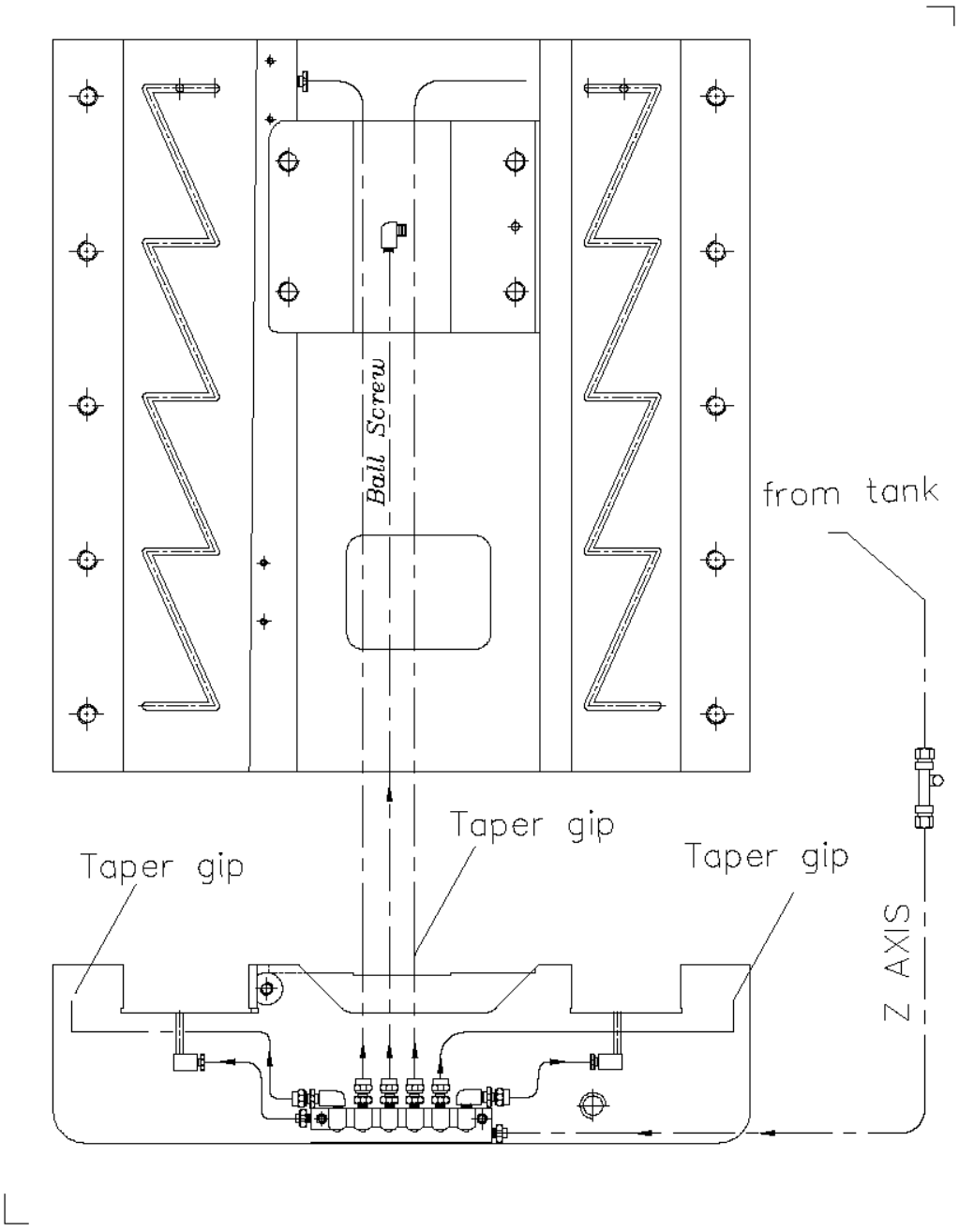
3-2 Centralized Lubrication Loop



3-3 Coollant

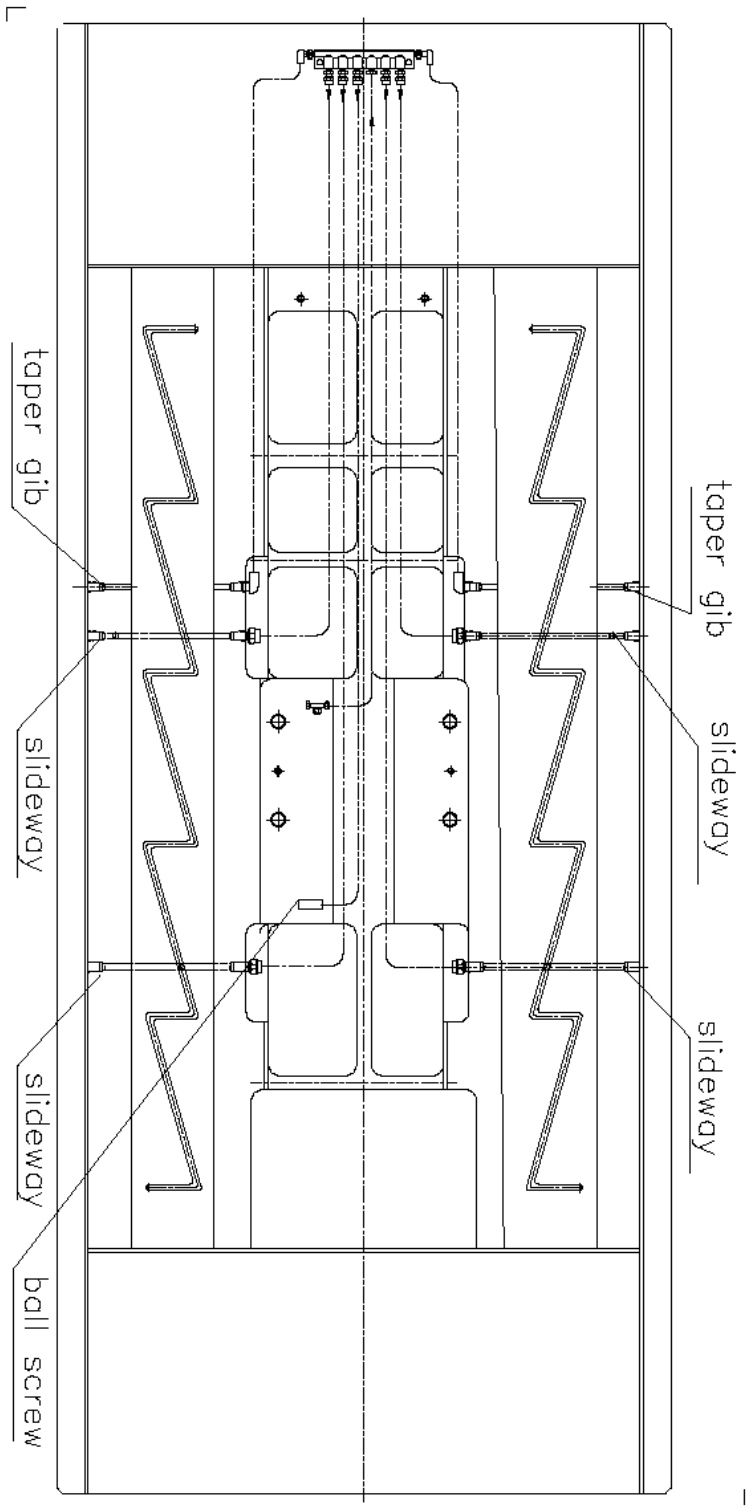


3-4 Spindle Housing And Column Slide way Lubrication

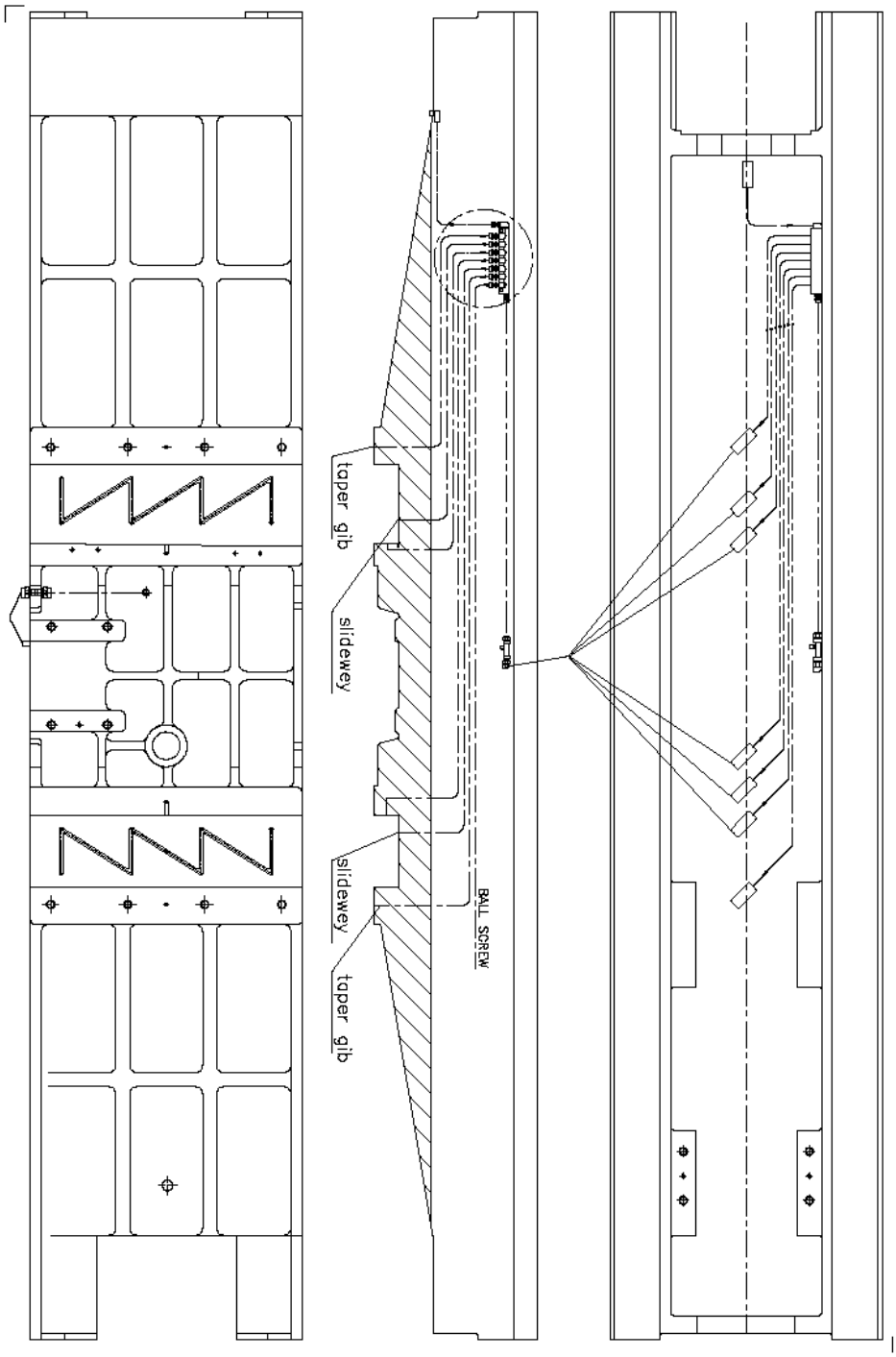


3-5 Saddle And Base Slide way Lubrication

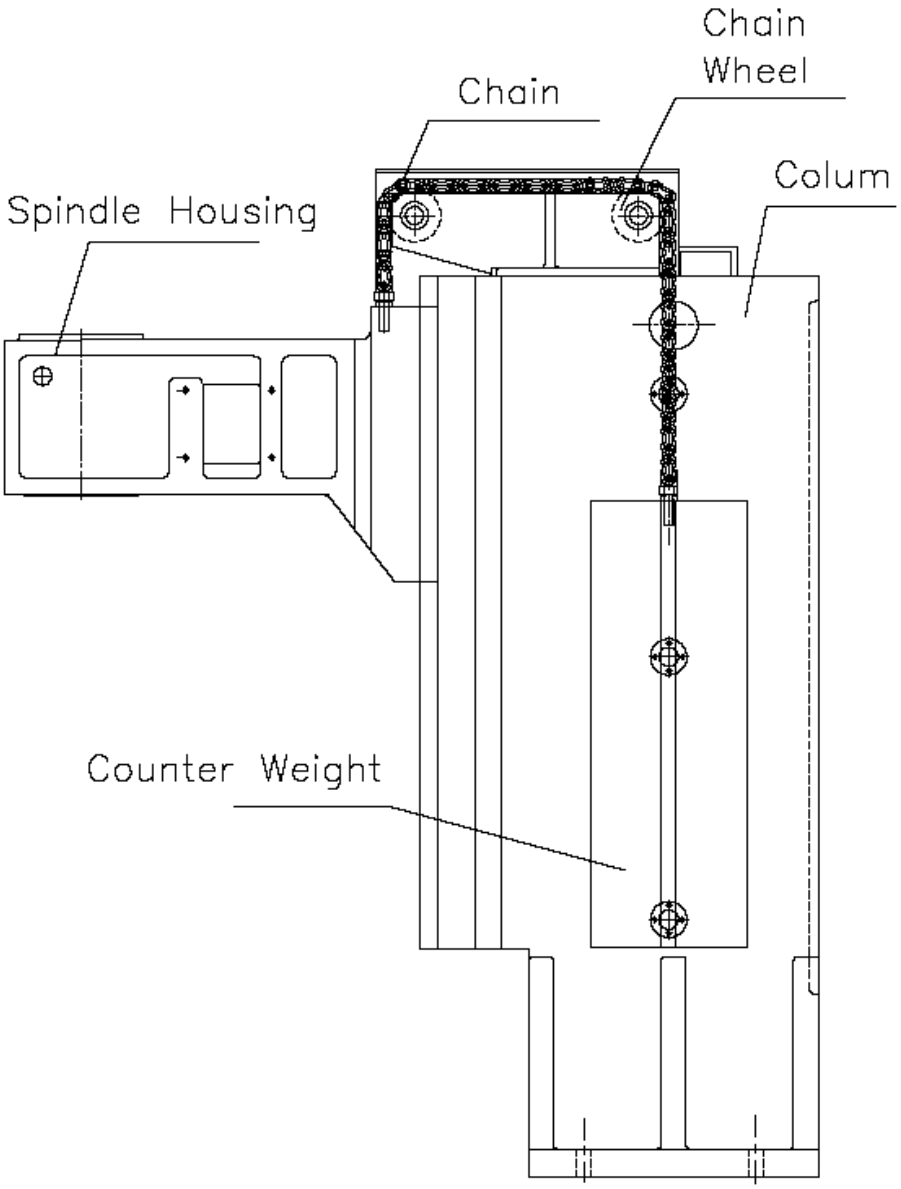
3-5-1 Saddle And Base Slide way Lubrication



3-5-2 Table Slide way Lubrication

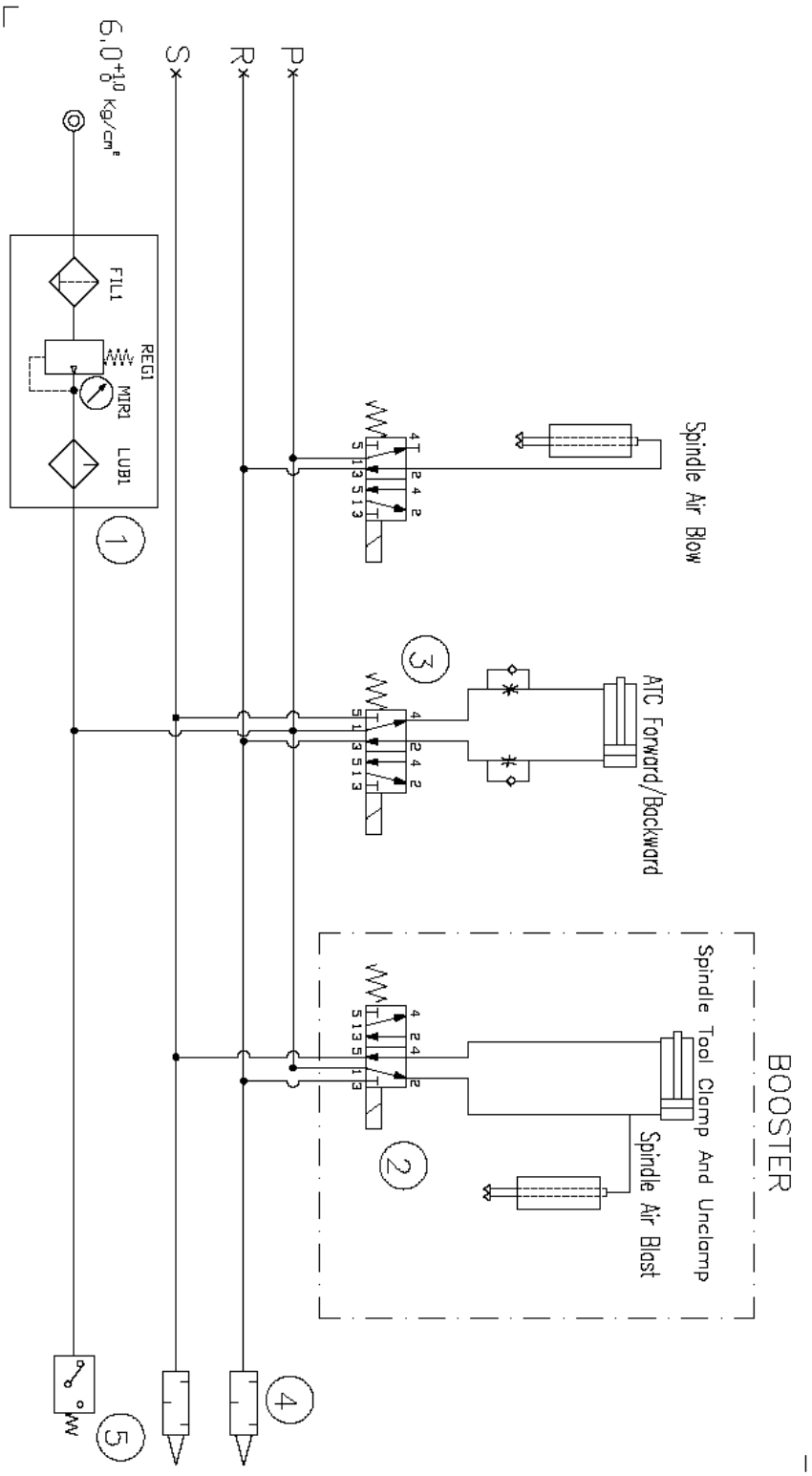


3-6 Manual Lubrication


Chain
Wheel
Chain
Colum
Spindle Housing
Counter Weight

4 Pneumatic System

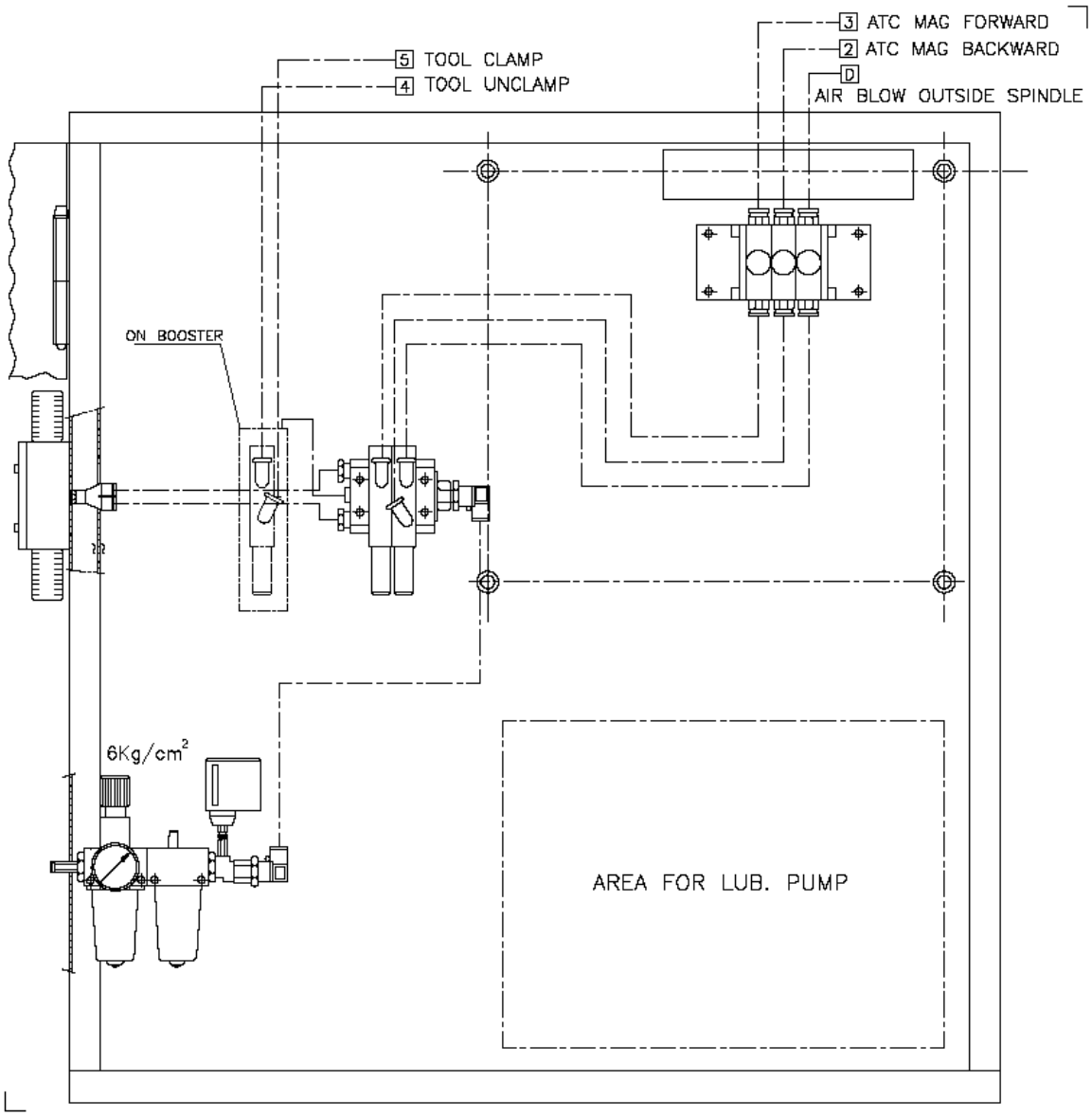
4-1 Pneumatic Loop



Pneumatic System Lis

No.	TAPE	NAME	AMOUND	REMARKS
05	KP.1 060-1101	Pressure Switch	1	
04	u-1/2	Noise Silencer	2	
03	FL 6002	Speed Regulator	3	
02	MVSD-260-4E1/110V	Electromagnetic Valve	2	
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:

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 filte 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:

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.

Throtte Valve :

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 oring.

Silencer :

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

i

5.Mechanosm Adjustment

5—1 Spindle Belt Adjustment

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

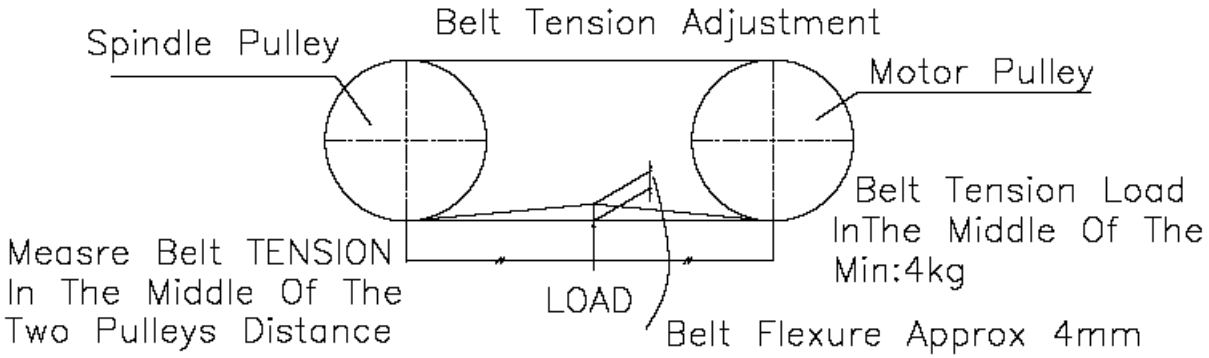
adjustment Procedure:

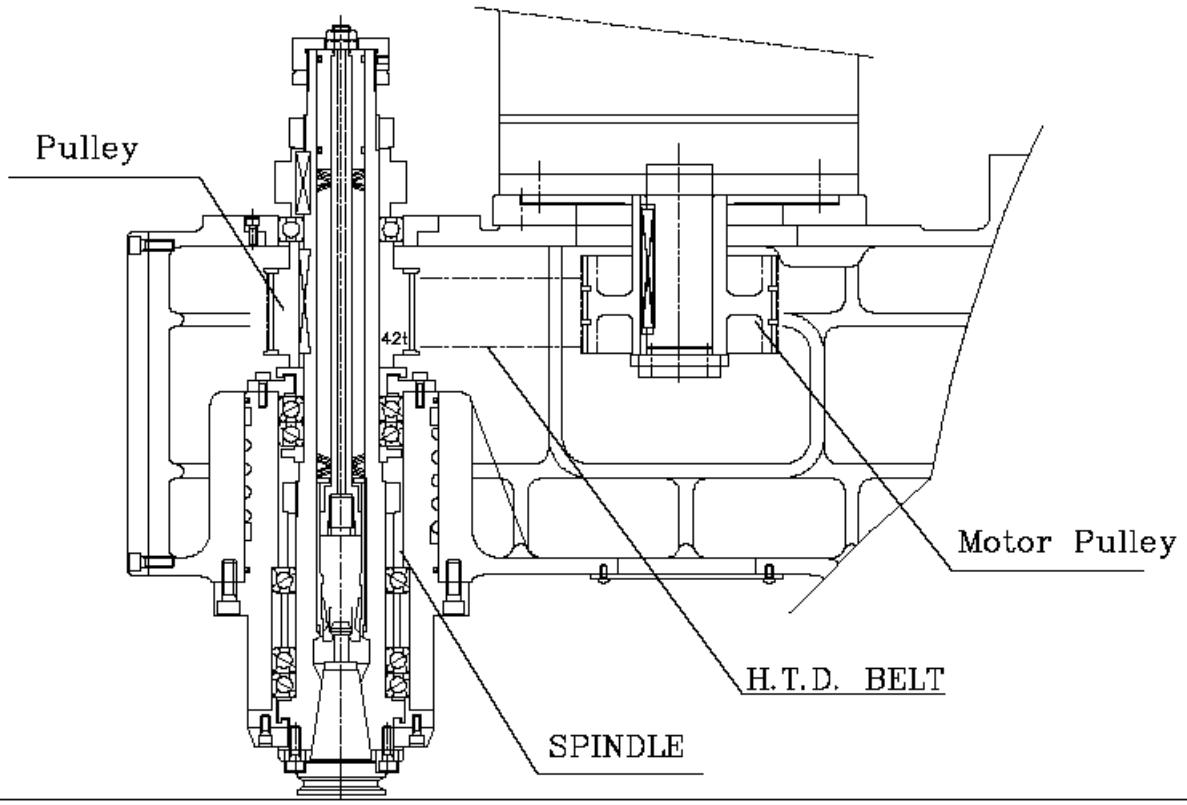
(1) Loosen the four fastening screws on the gear box base and two lock nuts on the adequate tension.

(2) Adjustment the adjusting bolts to adequate tension.

(3) Fasten the lock nuts.

(4) Fasten The Four Screws On The Gear Box.





5-2 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:

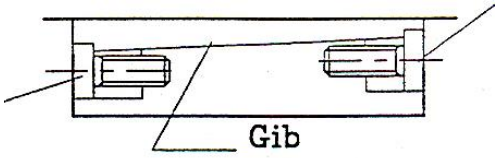
(1) Loosen the small end bolts.

(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

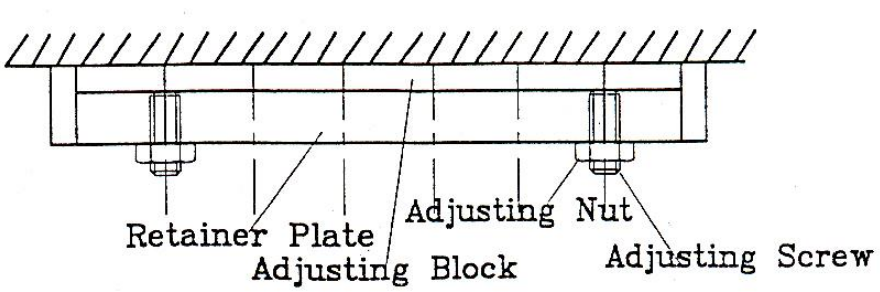
(1) Loosen adjusting nut.

(2) Adjust the adjusting screw and surface of adjusting

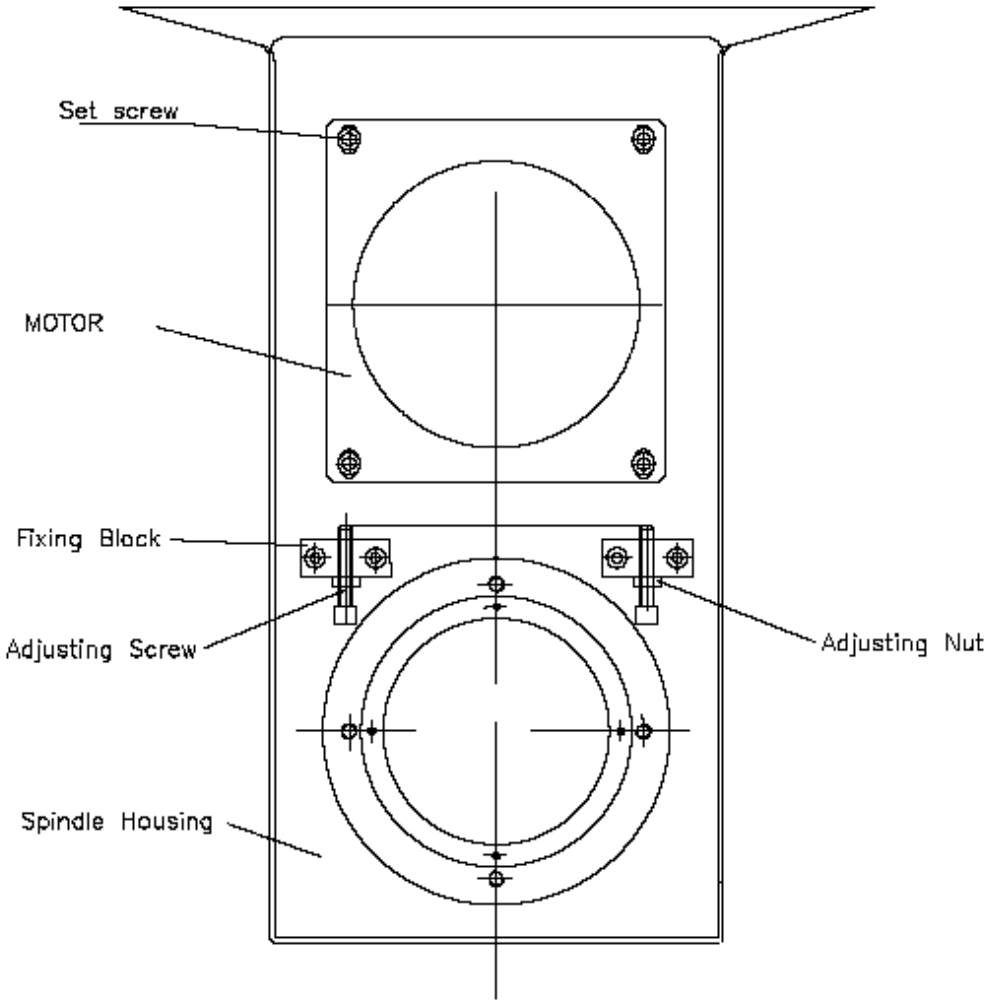
Block pressure is about 3.5 kg/cm.

(3) Fastening the big end bolts.

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



Adjusting The Spindle Belt



5-3. SPINDLE POSITIONING MECHANISM:

Spindle Positioning By encoder marker.

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 resuce the rotating speed to the slow speed. When the control senses the marker of spindle encoder, the spindle controller complete the positioning of spindle.

5-4 ATC MAGAZINE:

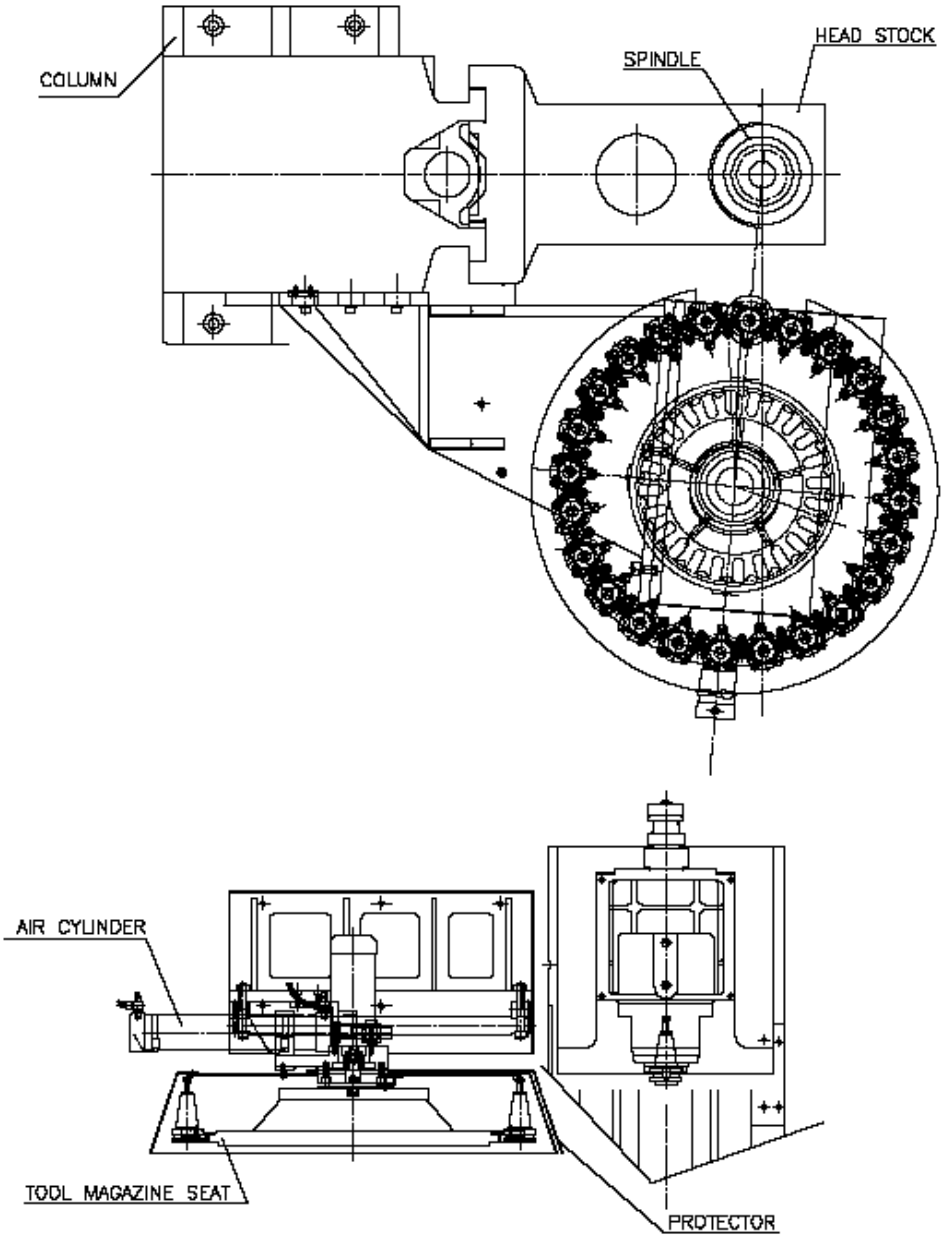
ATC magazine mechanism applies Drum type armless design. The tool magazine can store 24 pcs of tools. Because it is a simple structure with perfect design, it's easy for operation while running and the maintenance is simple.

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

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 Head stock (z axis).goes upward and remove tool from spindle and the speed reducer rotates to activate tool magazine to the desired position of tool. The Head stock (z axis) goes upwards to carry tool to the tool clamping position. The horizontal cylinder returns to the original position. The tool change action is completed.

For more information see operation manual of ATC.

ATC MAGZINE

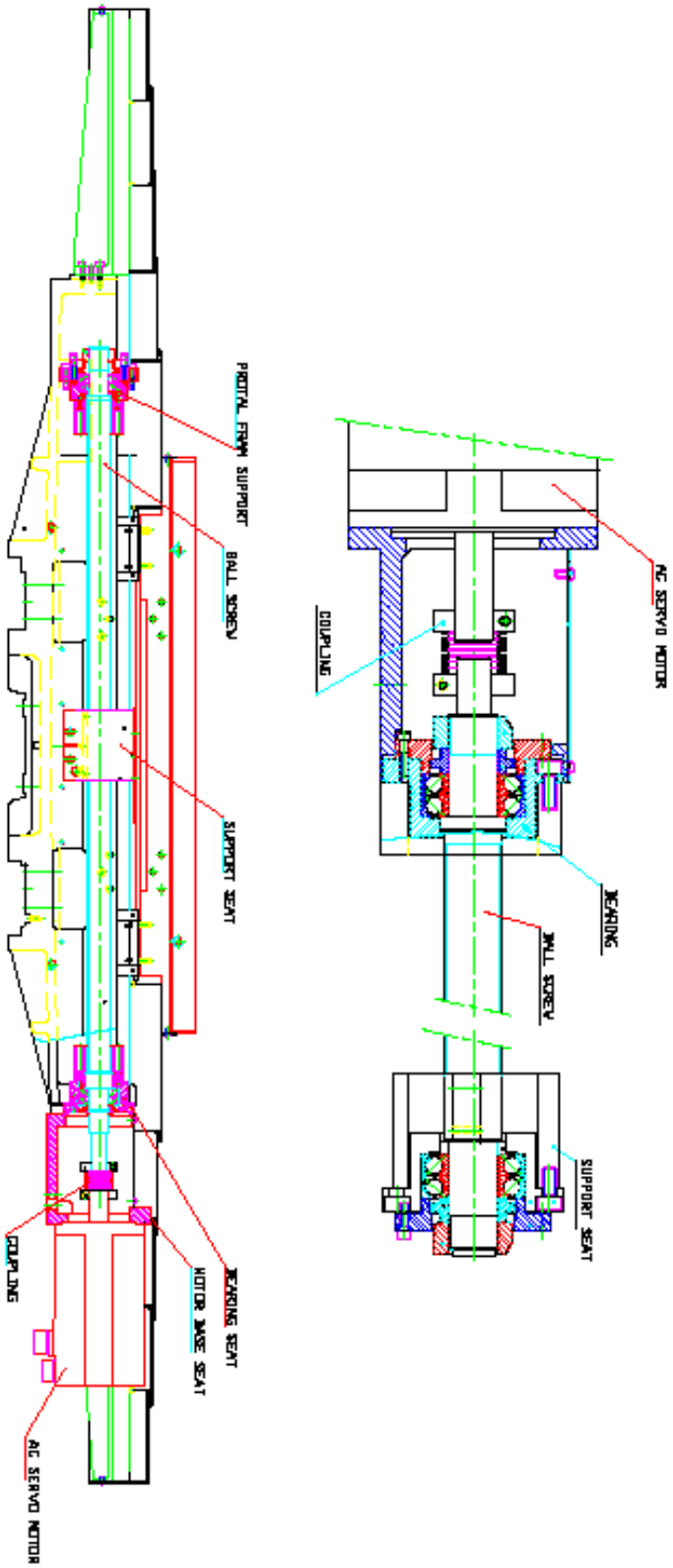

COLUMN
SPINDLE
HEAD STOCK
AIR CYLINDER
TOOL MAGAZINE SEAT
PROTECTOR

5-5 FEEDING TRANSMISSION MECHANISM:

5-5-1 X,Y,Z Axis Directly Counter Drive:

Way of X, Y, Z axis transmission: AC servo motor directly drive ball screws through coupler to activate work table , saddle and head stock to make them do front/back & left/right and up/down 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.

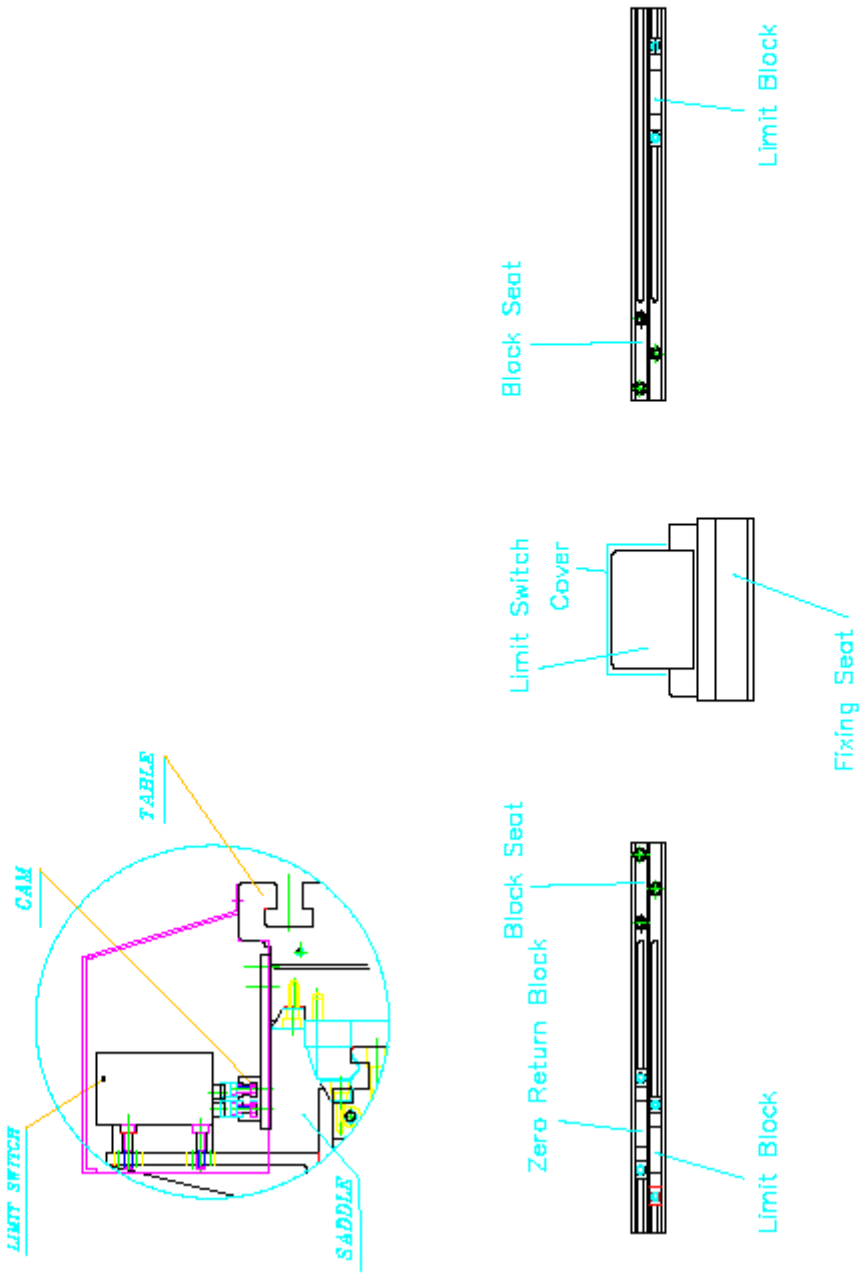
Directly Conntor Drive



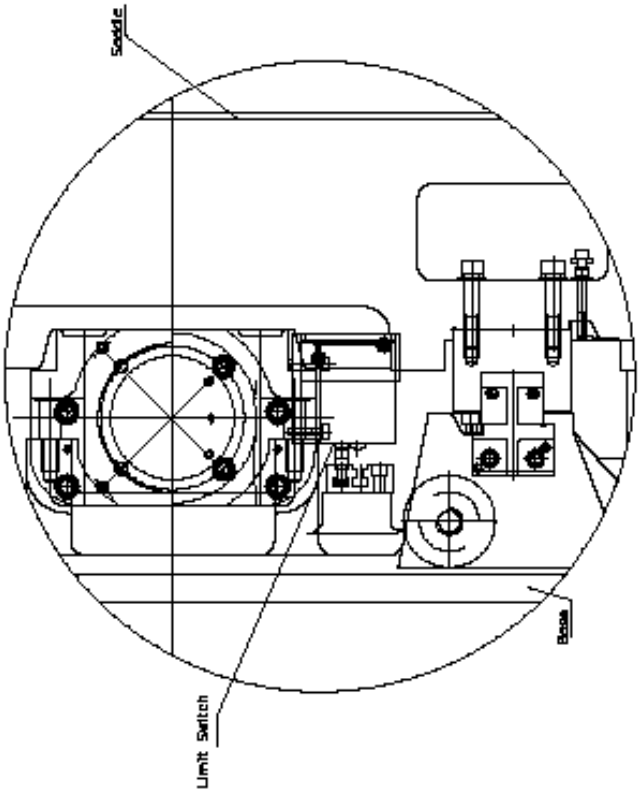
5-5-2 X,Y,Z Axis Positioning Mechanism: (Seep4-25,p4-26,p4-27,p4-28)

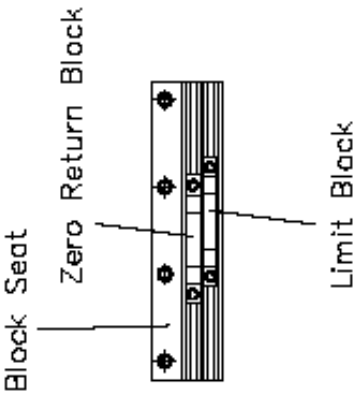
The machine is equipped with over travel detecting mechanism which can prevent over travel by the limit switch and the positioning block. Based on the central line of work area and work table surface, the limit switch is fixed on saddle, the fixing seat is fixed on the table and the two ends of the fixing 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.

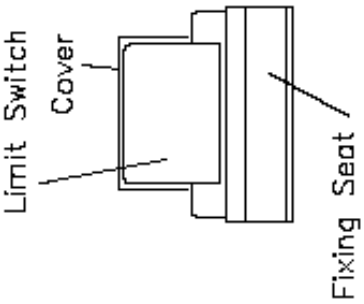
X-Axis Limit Switch

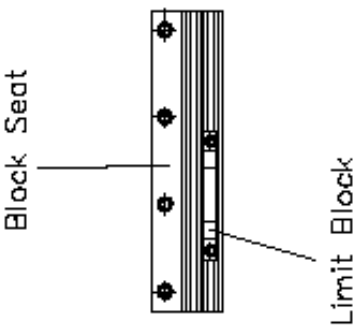


Y-Axis Limit Switch

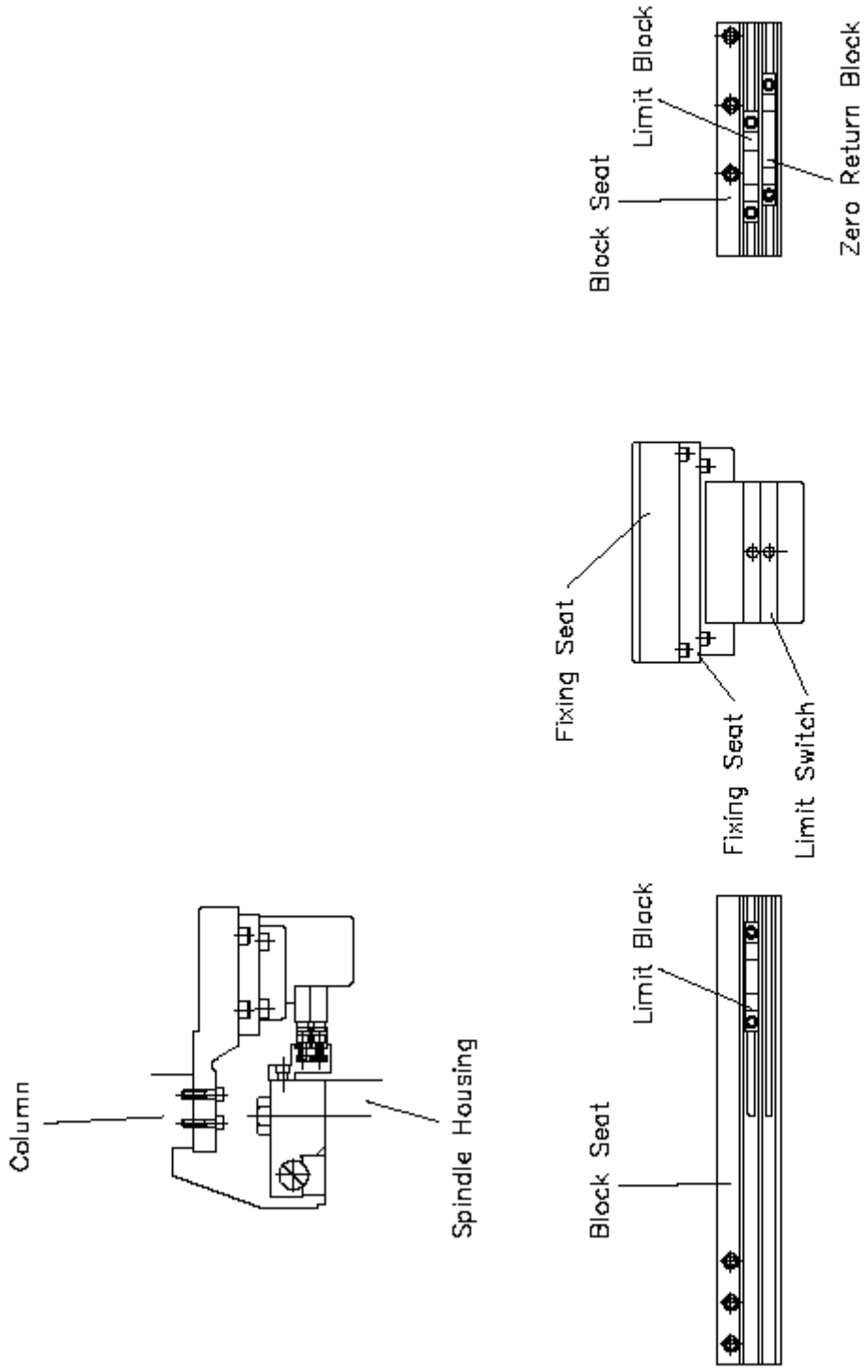




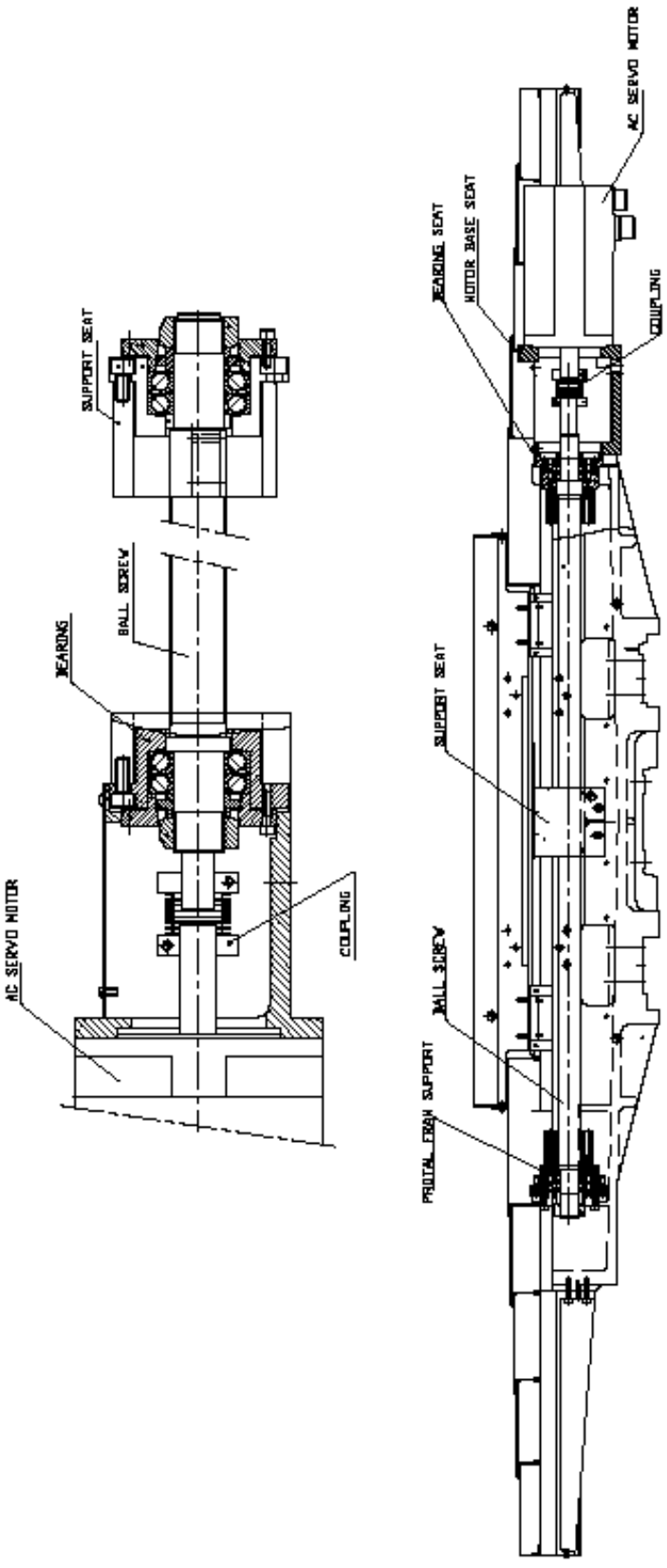




Z-Axis Limit Switch



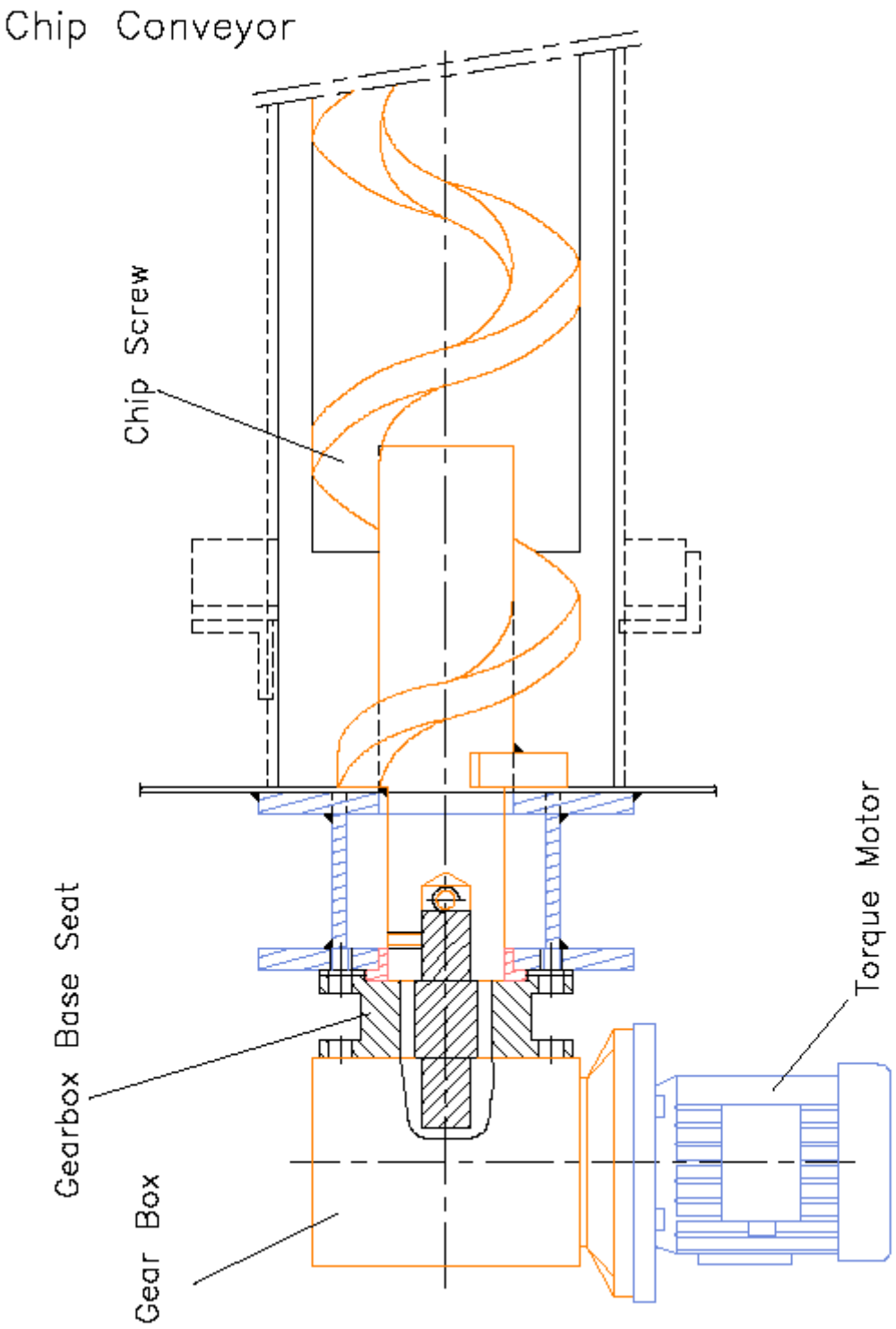
Directly Connter Drive



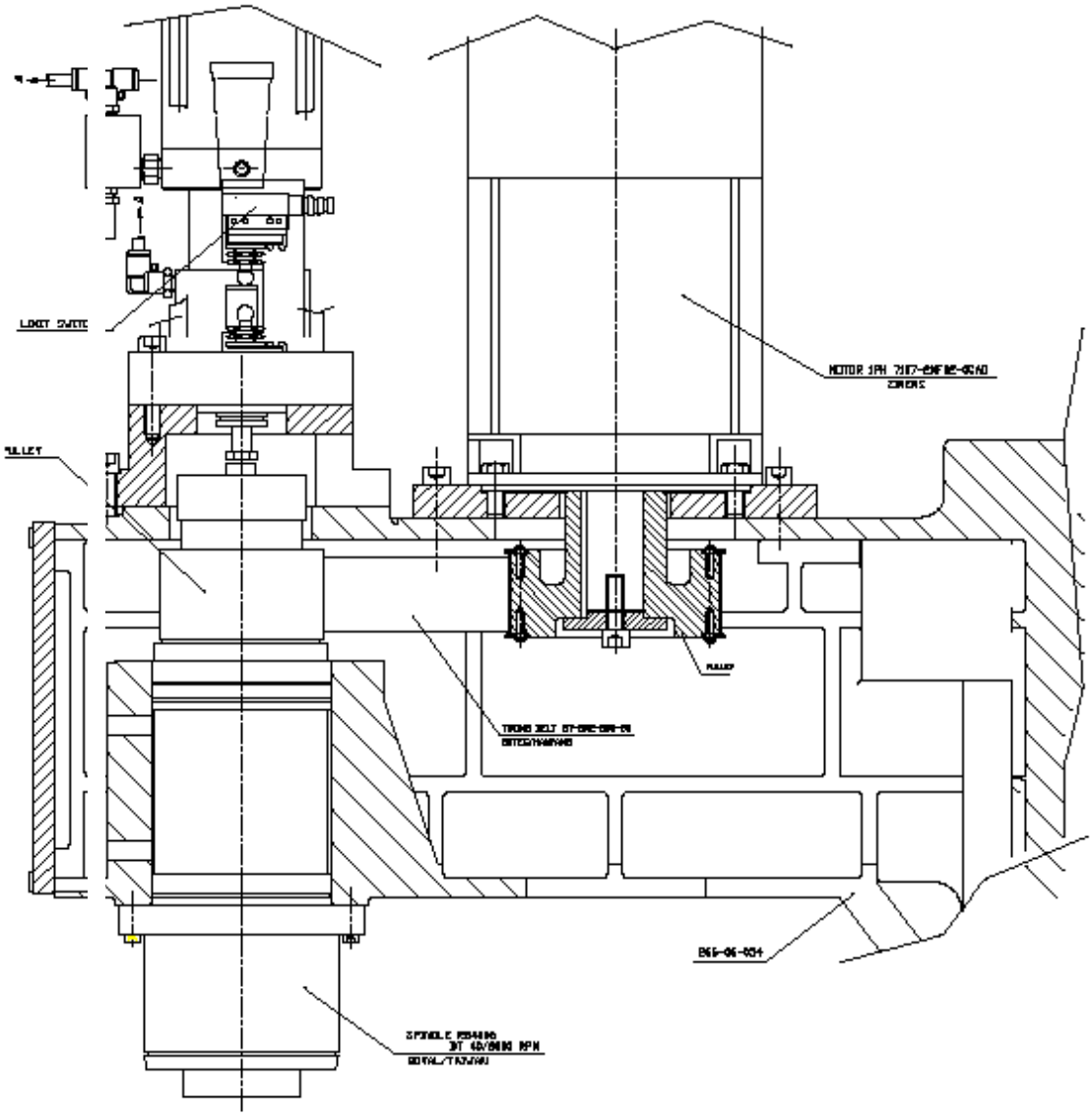
5-6 CHIP CONVEYOR:

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

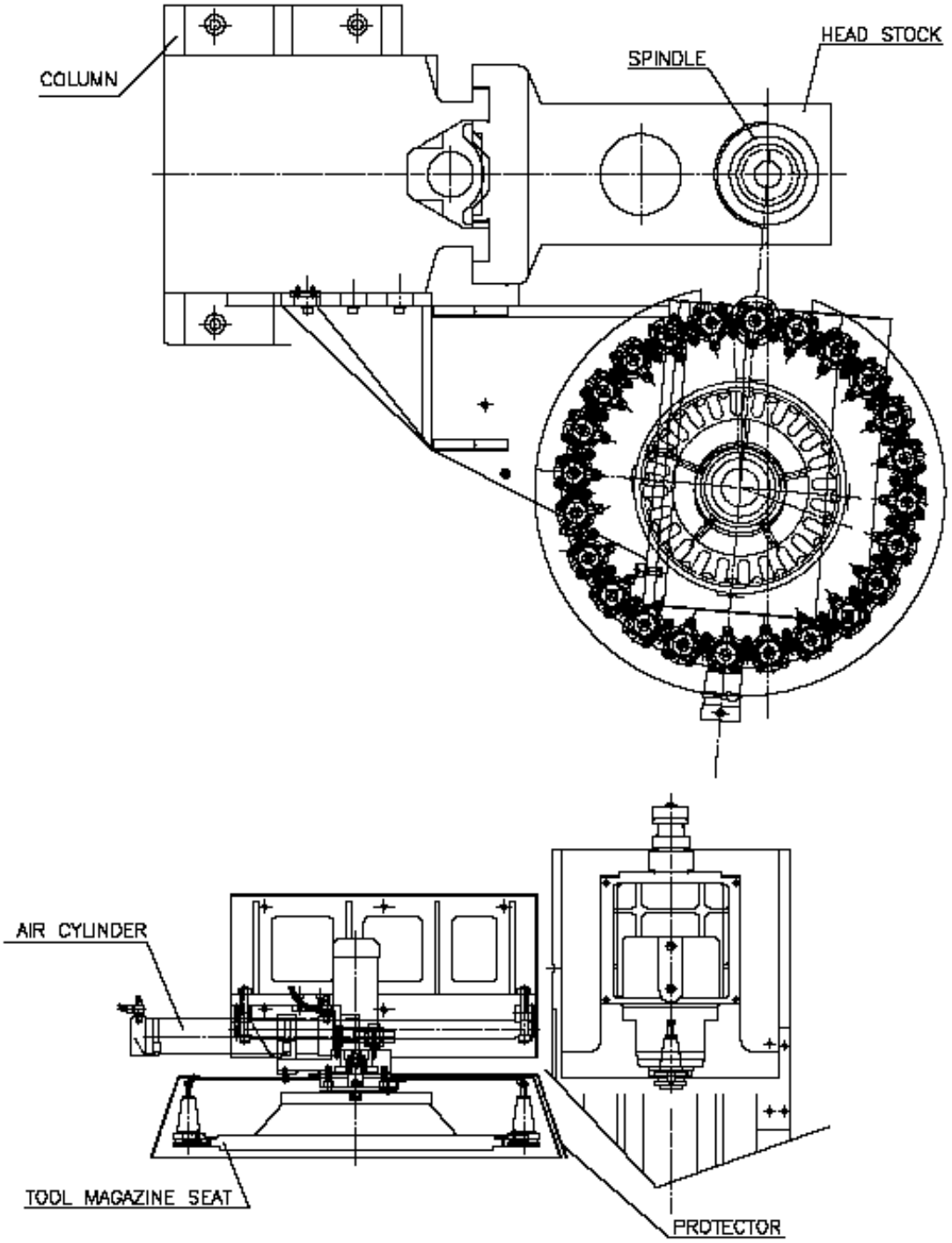
To prevent too many chips from sticking the chip spring, please open chip convey when chips are cut, otherwise when -too many chips stick the chip convey it will result in the motor burning up or breaking chip spring.


Chip Conveyor
Chip Screw
Gearbox Base Seat
Gear Box
Torque Motor

ISO40 spindle Transmission (withgear BOX)



ATC MAGZINE

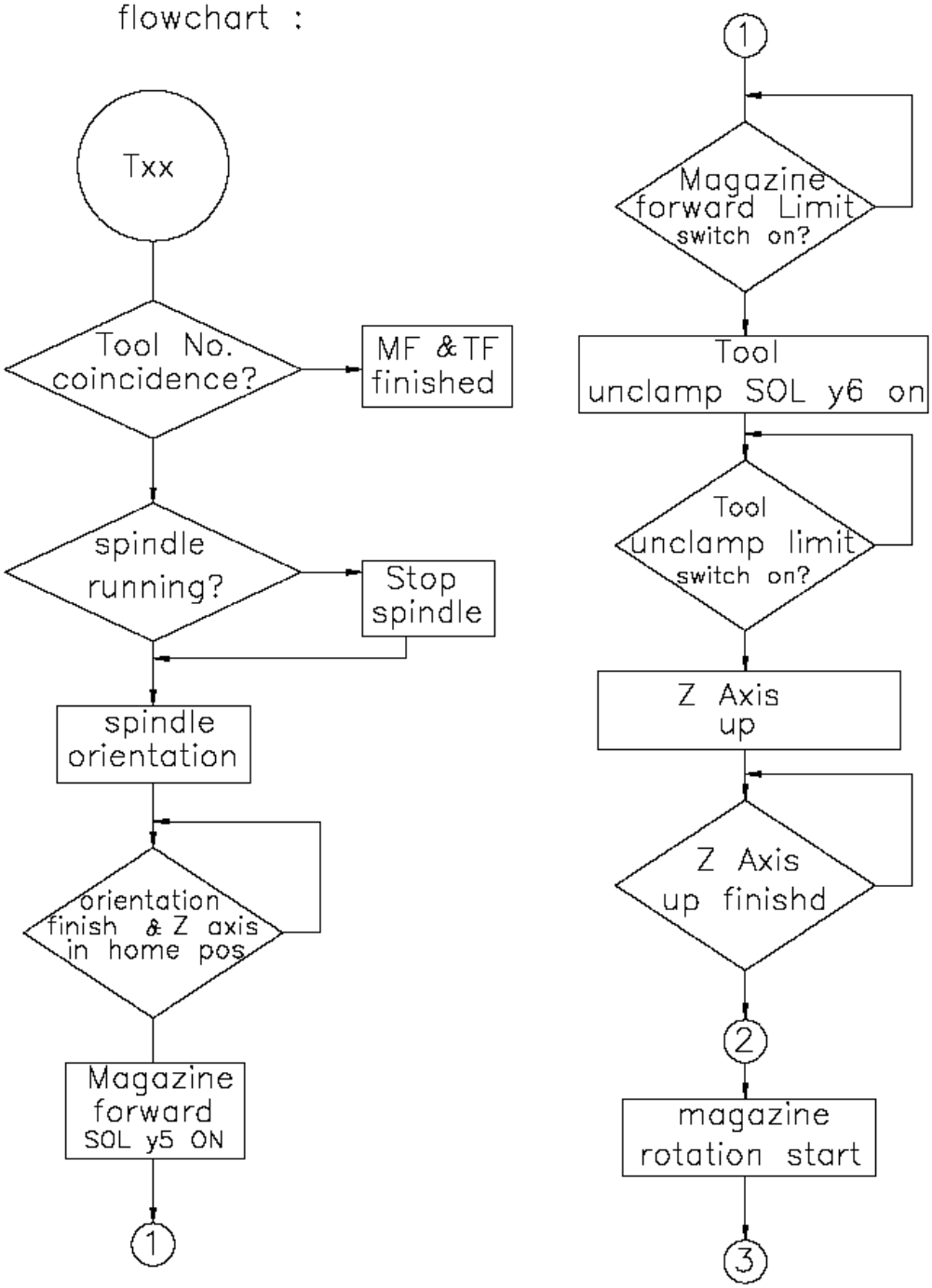

COLUMN
SPINDLE
HEAD STOCK
AIR CYLINDER
TOOL MAGAZINE SEAT
PROTECTOR

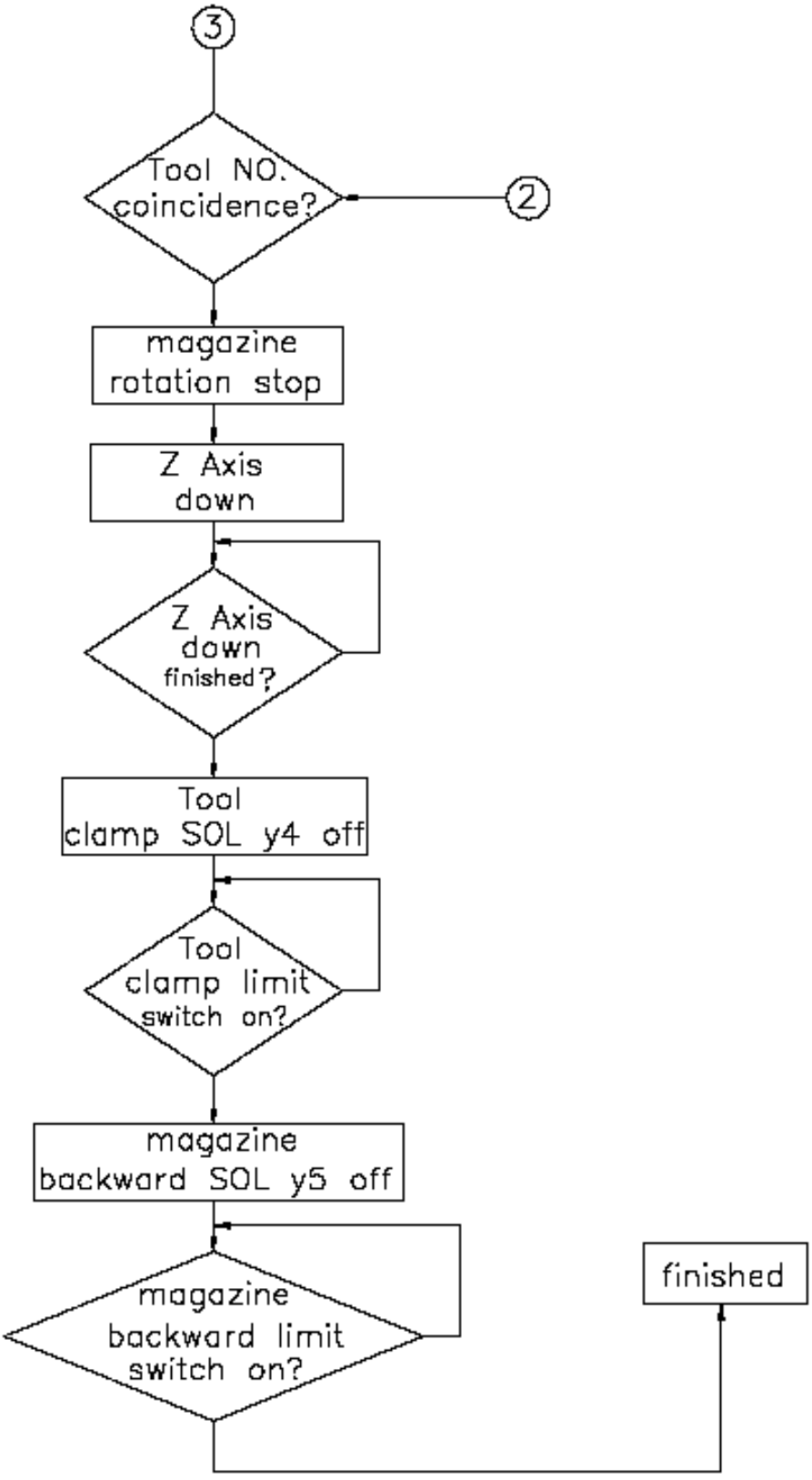
5-7 MAINTENANCE AND TROUBLE SHOOTING

1. ATC UNIT

(1) Tool change sequence

Tool change sequence is according to following flowchart :




3
Tool NO. coincidence?
2
magazine rotation stop
Z Axis down
Z Axis down finished?
Tool clamp SOL y4 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 votlage 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?

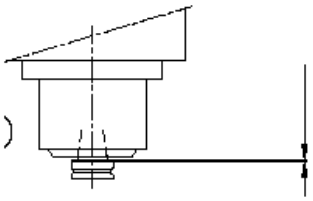
4. Align the Z axis home position with ATC.

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 overtravel alarm occured,set the parameter No.745 to 9999999 to release the alarm, reperform 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.

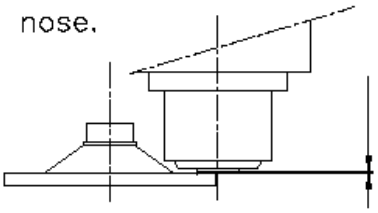
(4) Move the magazine to the spindle by hand slowly , be sure there is no tool on the pocket of magazine and spindle. Check if there is any obvious interference between tool pocket and spindle. If it is existed set mode select switch to HANDLE Z , use the manual pulse generator to move the Z axis untill 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(0) , and set the result to the parameter No.30600(0).

example: data of step(7)1.200mm
data of step(2) .625mm
.575mm
data of parameter 30600(0) −2500
result oflast operation +575
−1925
*the value of parameter no.30600(0) must be set to −1925.

(8−1) add the same result to the secord fixpoint parameter

example:
data of parameter 30600(1) −2200
result oflast operation +575
−1625

(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.

5-8 MAINTENANCE OF ELECTRIC BOX COOLING UNIT:

After electric box cooling unit has been used for a long p of time, it can produce vibration, noise or oil accumulated and dirts.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:

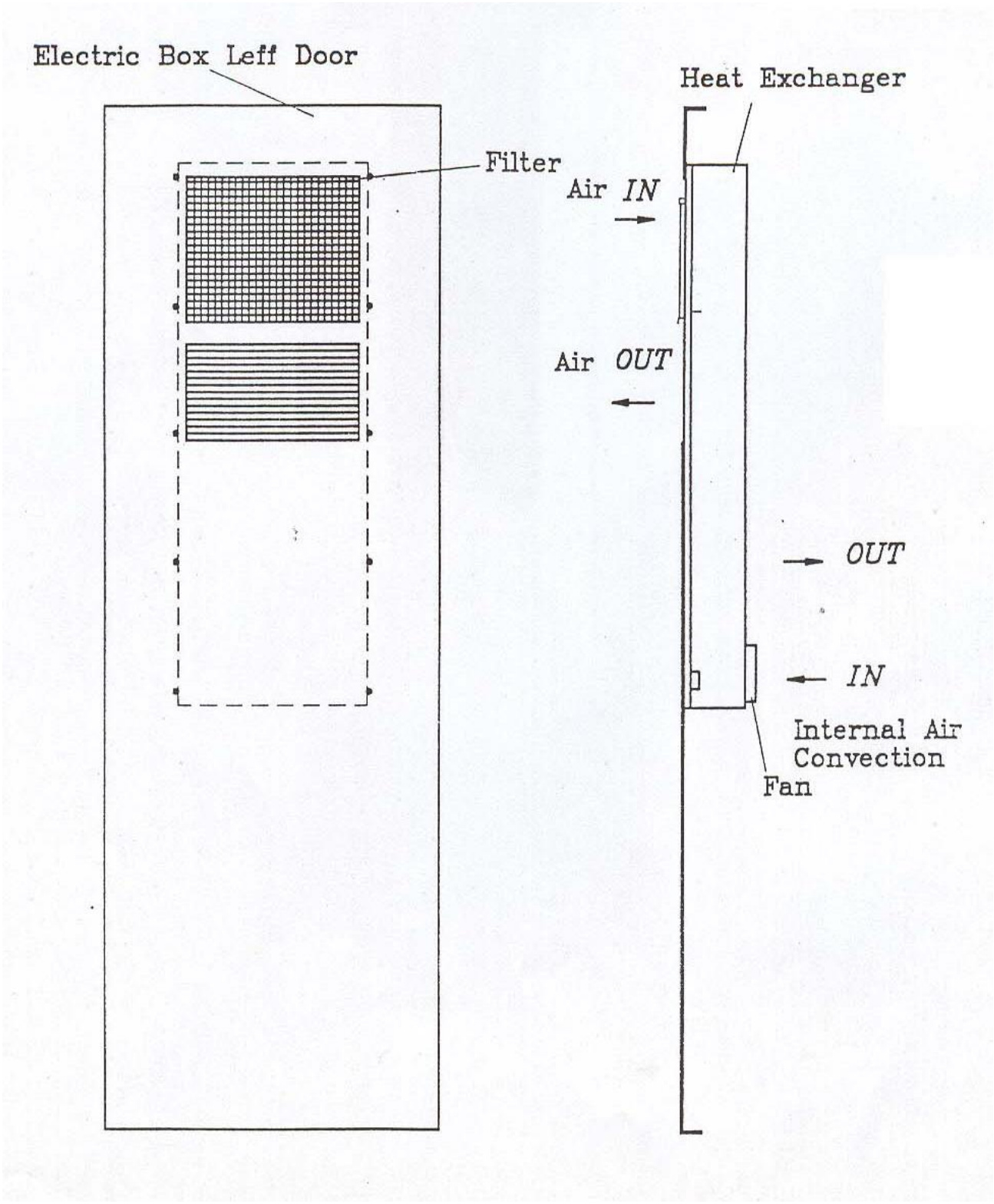
(1) Min./Max. temperature: -29/68$^{\circ C}$

(2) Place of installation:

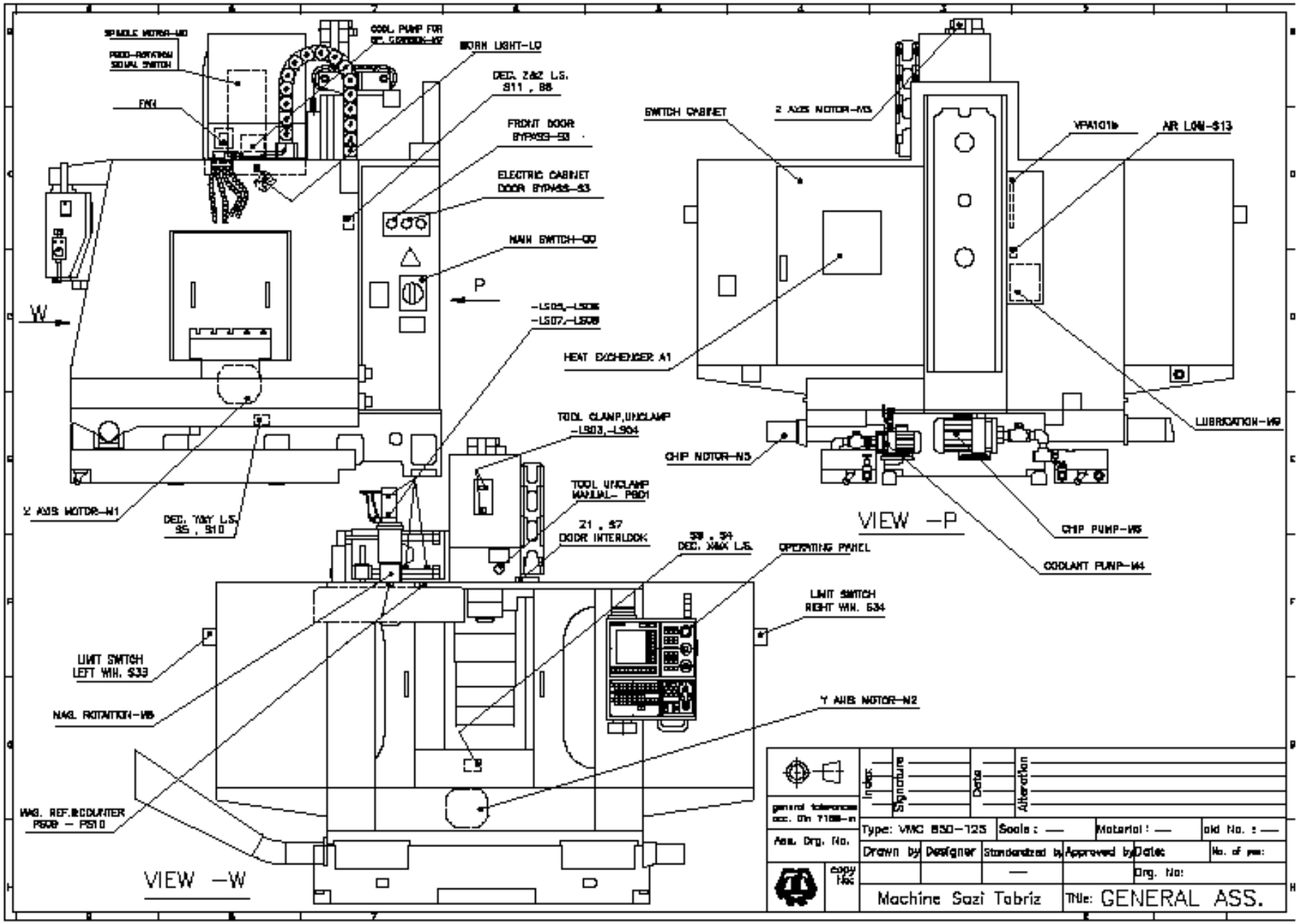
- Install at cool or waterproofed suitable place.
- Avoid corrosive atmosphere.

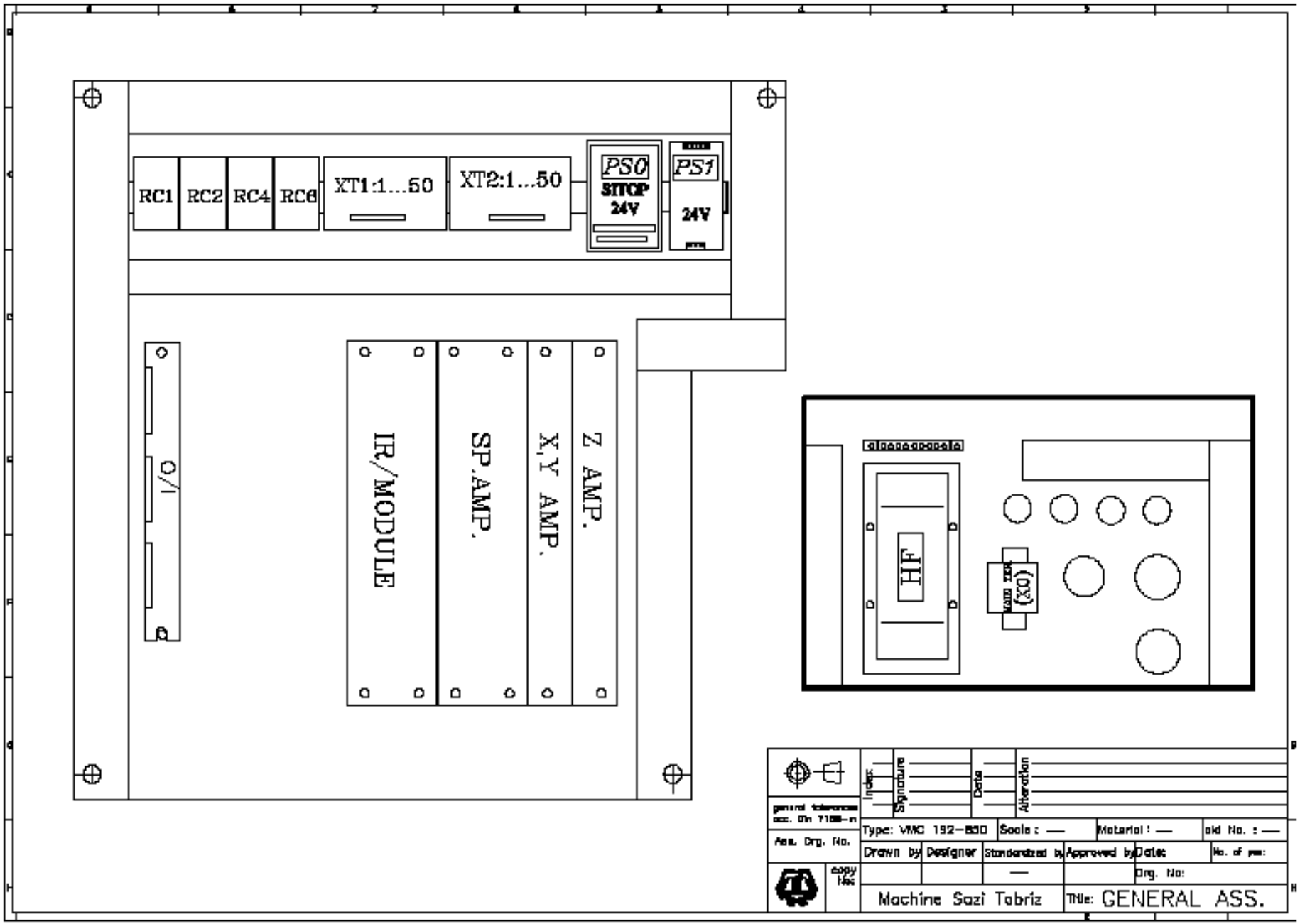
TIME	PART	CHECKING POINT	GUIDES
Every day (After initial use)	Inner/outer fan	Check if blades' rotation is normal and if there is noise or vibration, occurring.	If abnormal is found, find out the cause. If fan is out of order, replace it.
Weekly or monthly	Filter	Oil accumulated, Dirt	(1) For slight dirt, lightly tap filter or clear them by dust extractor. (2) For heavy dirt, wash with reutral 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.

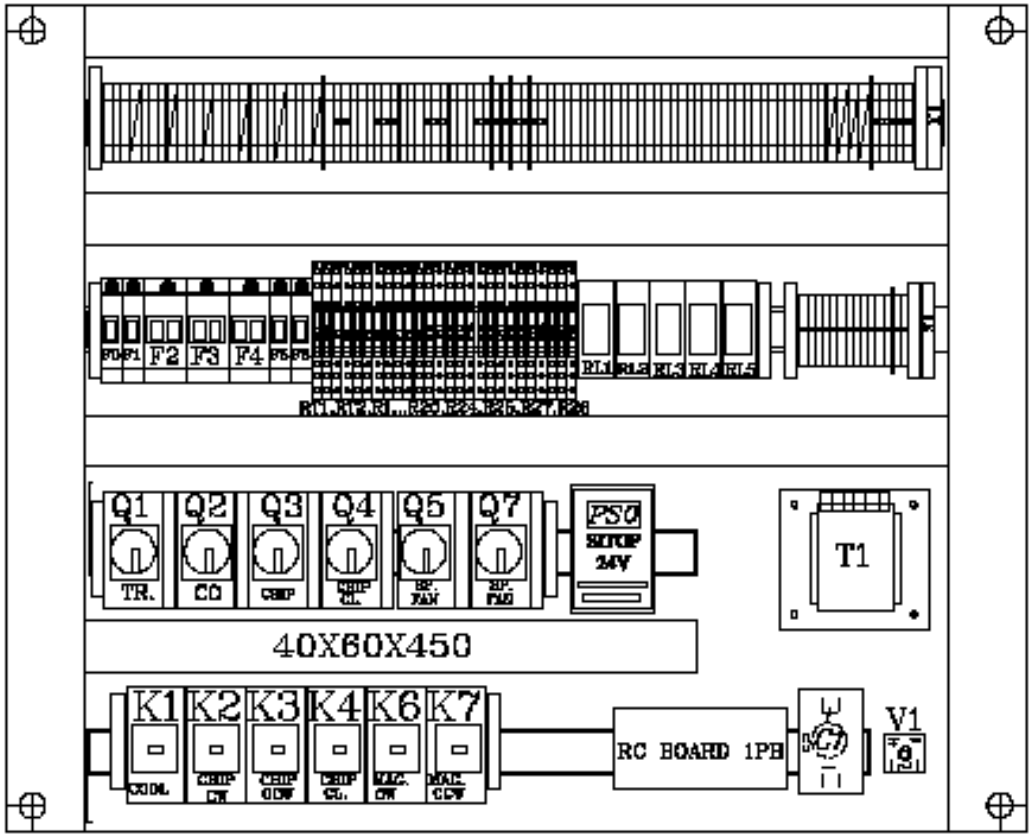
* Periodically and-thoroughly-clear filter and fan every time


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

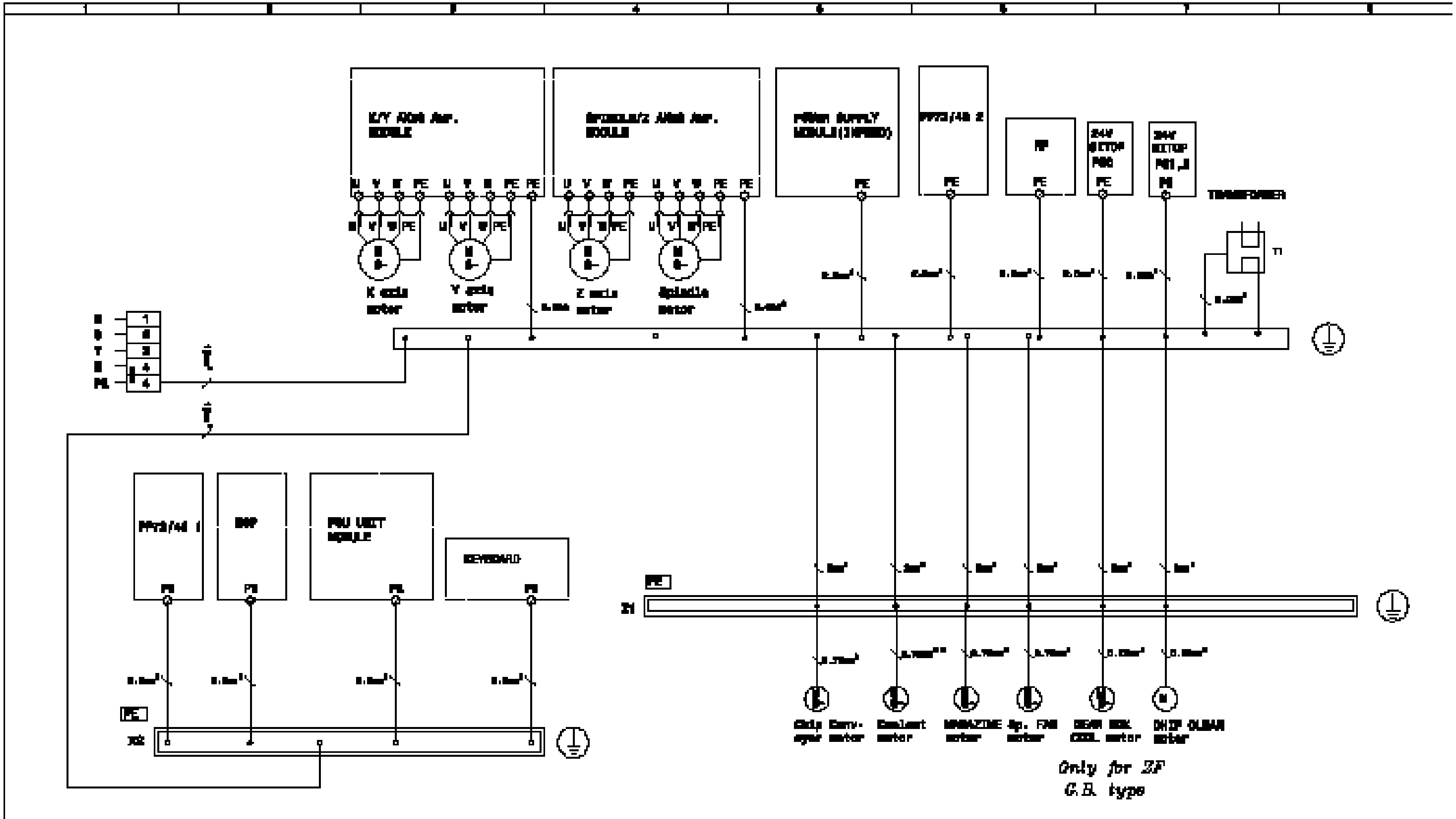
V. ELECTRICAL DIAGRAM


SPINDLE MOTOR-M0
FEED-ROTATION SIGNAL SWITCH
FAN
COOL. PUMP FOR WORK CLEANING-M7
WORK LIGHT-L0
DEC. Z&Z L.S. S11 , S8
FRONT DOOR BYPASS-S0
ELECTRIC CABINET DOOR BYPASS-S3
MAIN SWITCH-Q0
P
W
-LS05,-LS06
-LS07,-LS08
HEAT EXCHENGER A1
SWITCH CABINET
2 AXIS MOTOR-M3
VPA101b
AIR LOW-S13
LUBRICATION-M9
TOOL CLAMP,UNCLAMP -LS03,-LS04
CHIP MOTOR-M5
TOOL UNCLAMP MANUAL- PB01
X AXIS MOTOR-M1
DEC. YAX L.S. S5 , S10
21 , 27 DOOR INTERLOCK
39 , 31 DEC. XAA L.S.
OPERATING PANEL
VIEW -P
CHIP PUMP-M6
COOLANT PUMP-M4
LIMIT SWITCH RIGHT WH. S34
LIMIT SWITCH LEFT WH. S33
Y AXIS MOTOR-M2
MAG. ROTATION-M8
MAG. REF.&COUNTER PS08 - PS10
VIEW -W
general tolerances acc. DIN 7168-m
Index
Signature
Date
Alteration
Type: VMC 850-725
Scale : —
Material : —
old No. : —
Ass. Drg. No.
Drawn by Designer
Standardized by —
Approved by Date
No. of ass:
Drg. No:
copy file
Machine Sazi Tabriz
Title: GENERAL ASS.


RC1
RC2
RC4
RC6
XT1:1...50
XT2:1...50
PS0
SITOP
24V
PS1
24V
I/O
IR/MODULE
SP.AMP.
X,Y AMP.
Z AMP.
FH
(X1)
Index
Signature
Date
Alteration
general tolerances acc. DIN 7168-m
Type: VMC 192-650
Scale : —
Material : —
old No. : —
Ass. Drg. No.
Drawn by
Designer
Standardized by
Approved by
Date:
No. of pos:
Drg. No:
copy No:
Machine Sazi Tabriz
Title: GENERAL ASS.



general tolerances acc. DIN 7168-m	Index	Signature	Date	Alteration		
Ass. Drg. No.	Type: VMC 192-800	Scale : —	Material : —	old No. : —		
	Drawn by: Designer	Standardized by	Approved by	Date:	No. of pos:	
copy No:		—		Drg. No:		
	Machine Sazi Tabriz		Title: GENERAL ASS.			



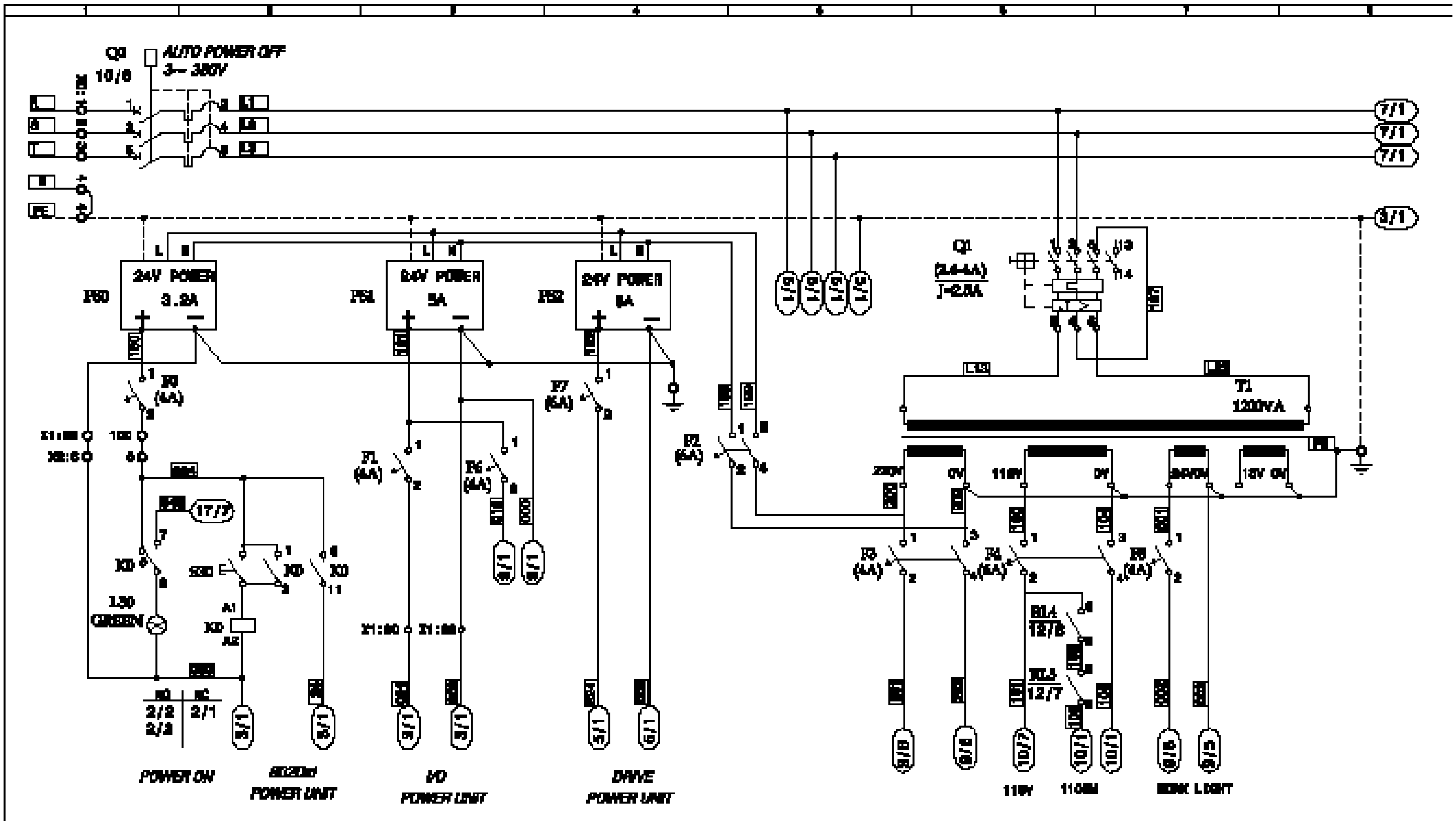
TITLE

PROTECTION EARTH

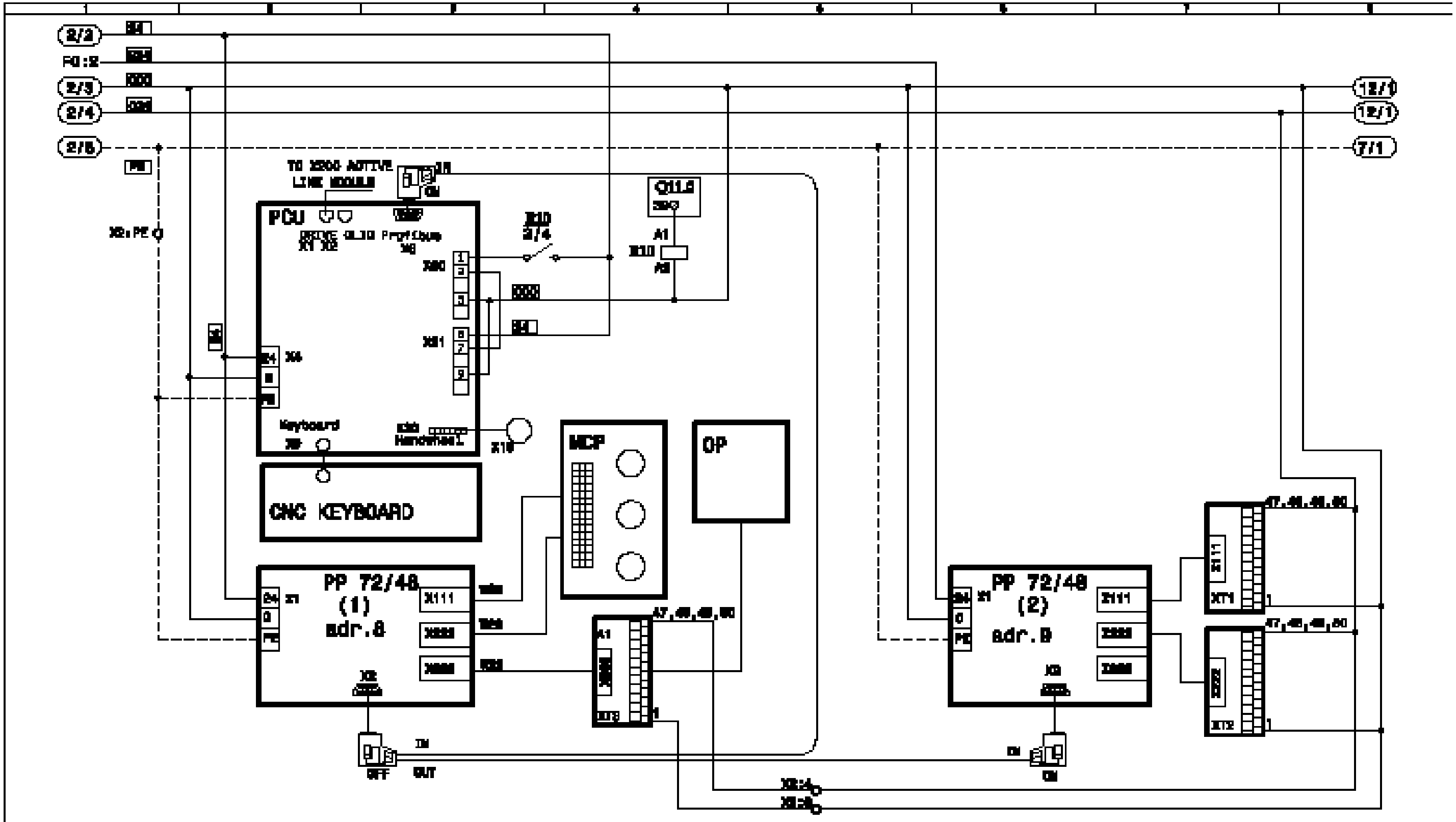
203-36-006

REPEATED TYPE:181,182,288

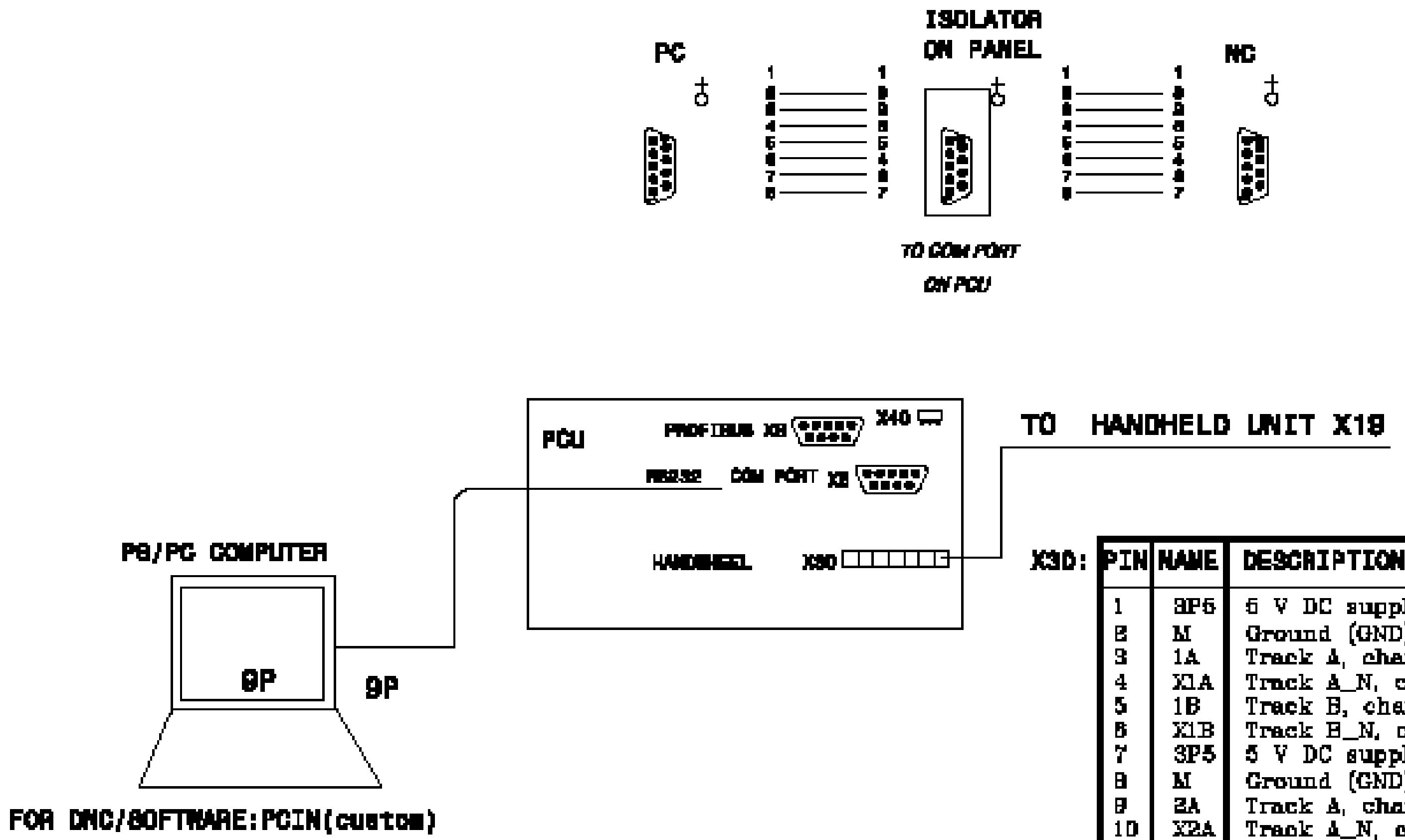
TYPE VMC 128/SIEMENS802D



TITLE	POWER SUPPLY
	203-36-006
REPEATED TYPE:181,182,288	
TYPE	VMC 125/SIEMENS802Cbl
P. 2	



TITLE	CONTROL POWER
REPEATED TYPE:181,182,206	
203-36-006	
TYPE	VMC 120/SIEMENS802Dsl
Pg.	3



X30:

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 | DRAWN | CHECKED | STANDARD | APPROVED | DATE | SIGNATURE

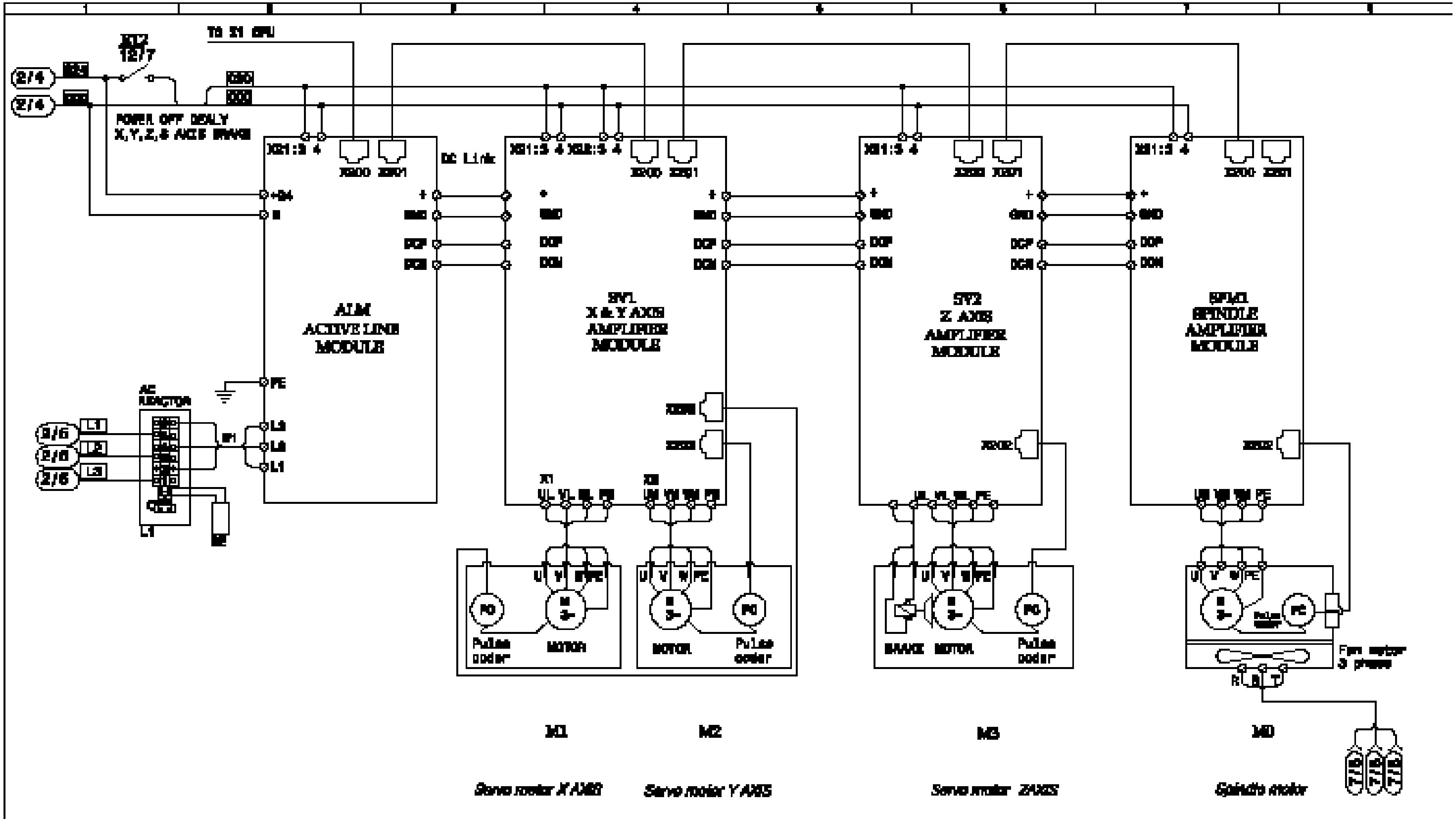
TITLE: RS 232

REPEATED TYPE:181,182,288

203-36-006

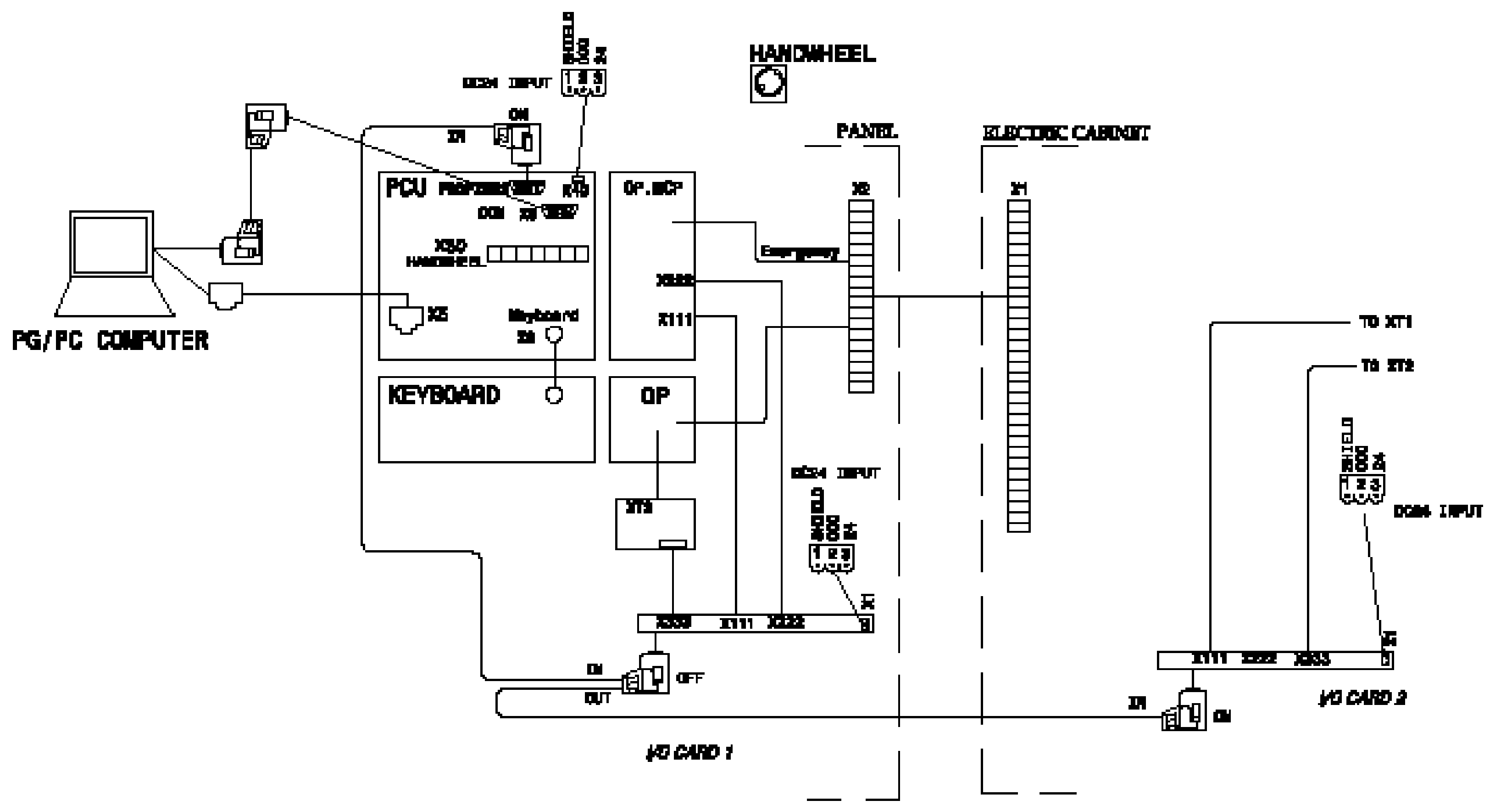
TYPE VMC 120/SIEMENS802D

Pg. 4



TITLE SP&FEED DRIVES	203-36-006	Pa. 5
REPEATED TYPE:181,182,288	TYPE VMC 1250 EMENSS020M	

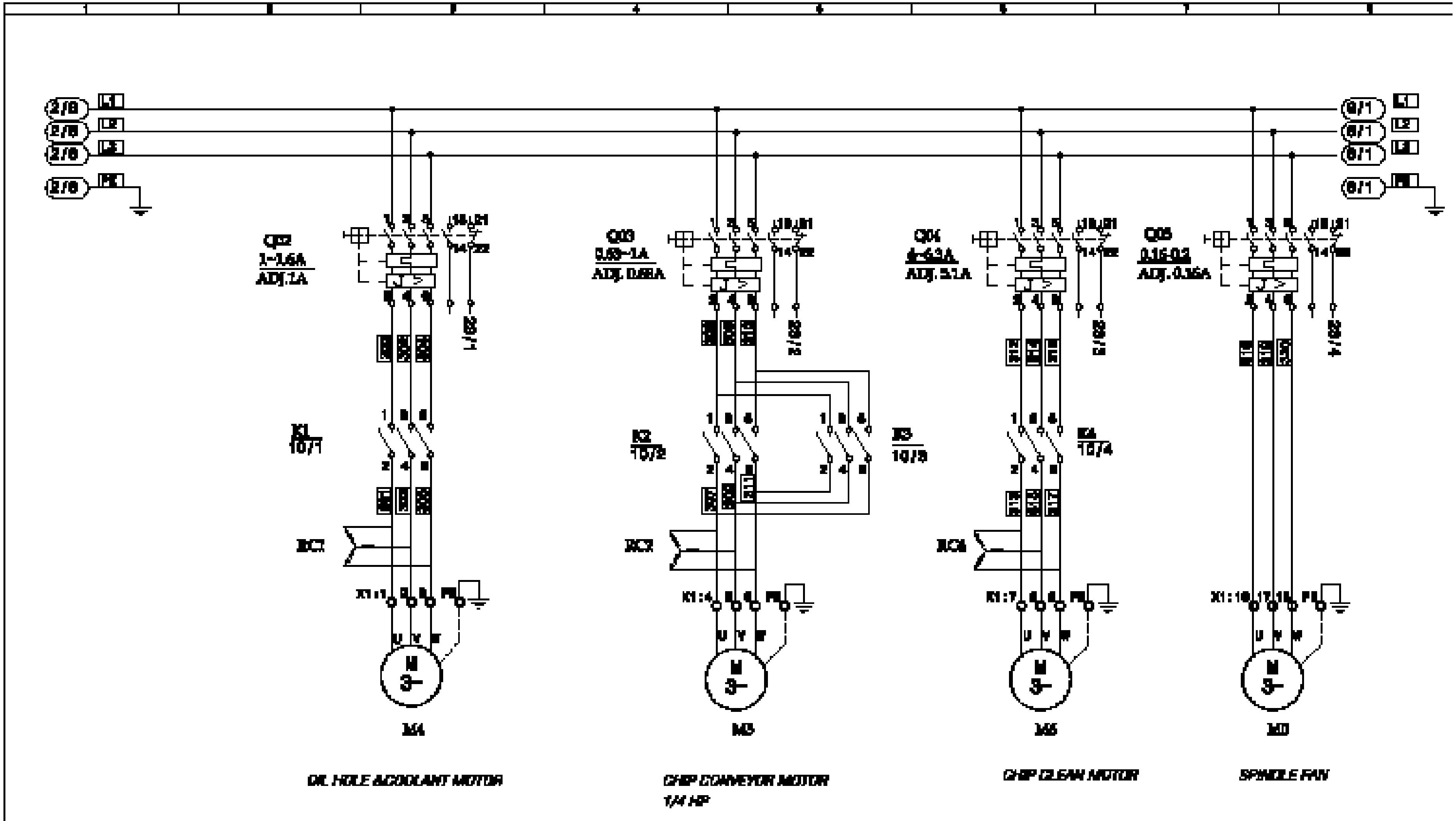
DRAWED
CHECKED
STANDARD
APPROVED



CONTROL CONECTION

203-36-006

REPEATED TYPE:181,182,288



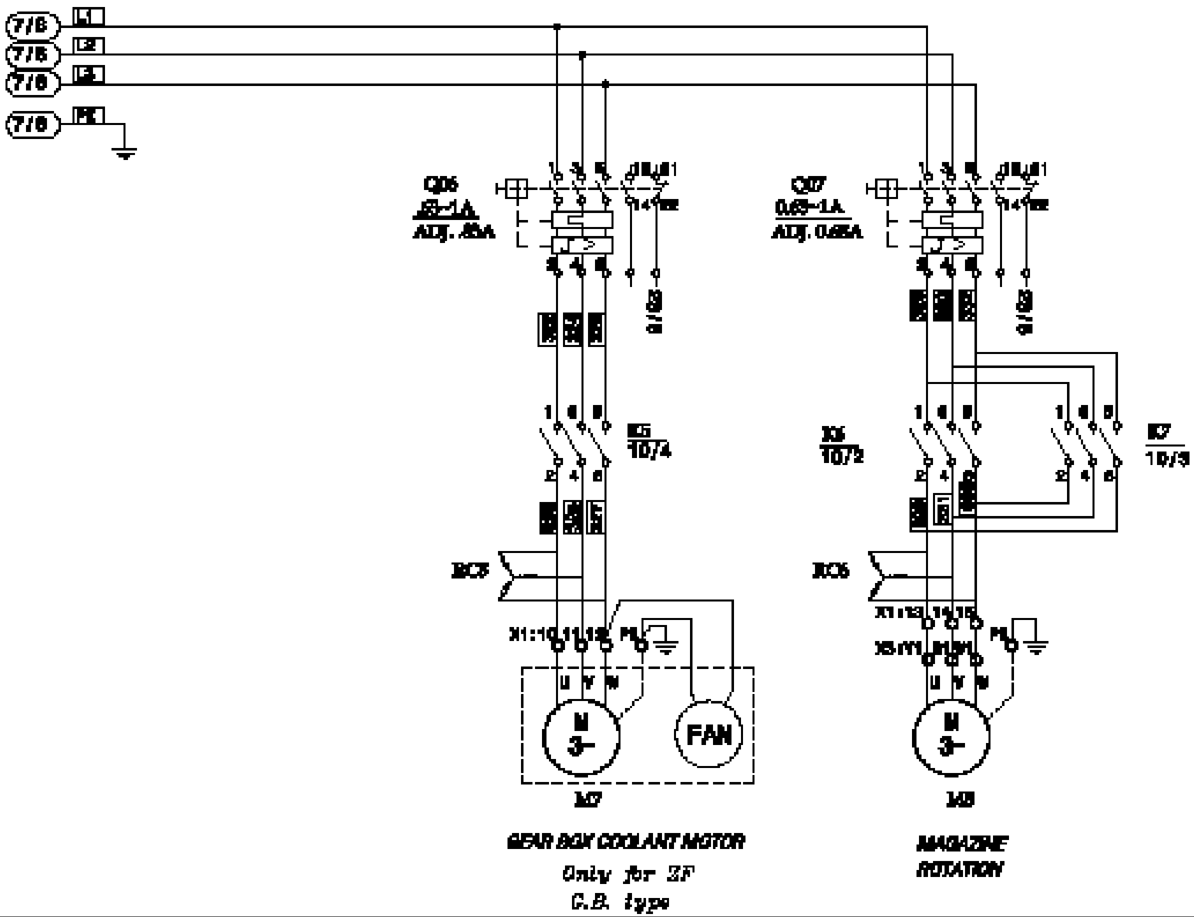
TITLE: AC MOTORS

203-36-006

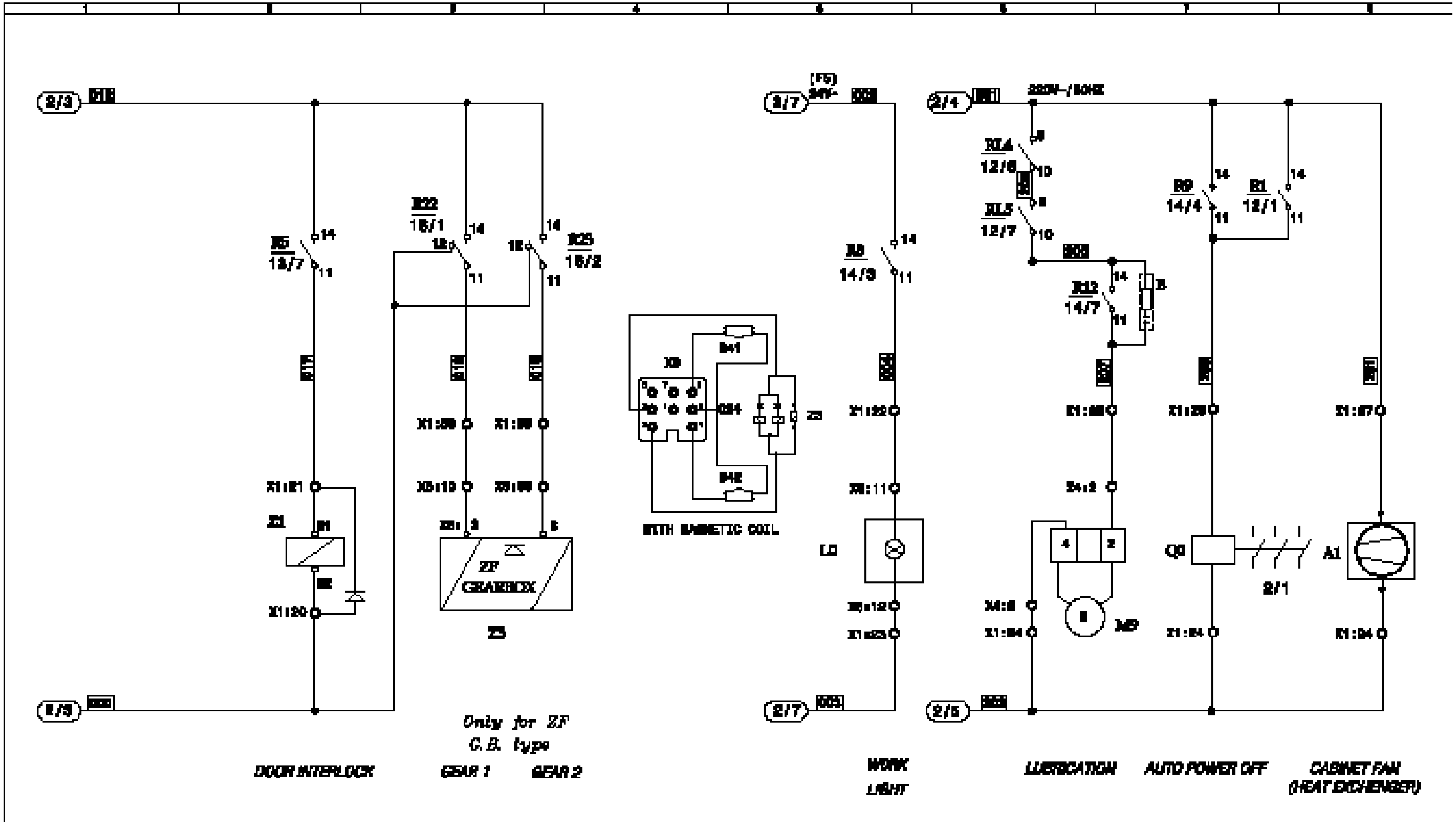
REPEATED TYPE:181,182,208

TYPE: VMC 1250/SIEMENS802Dsl

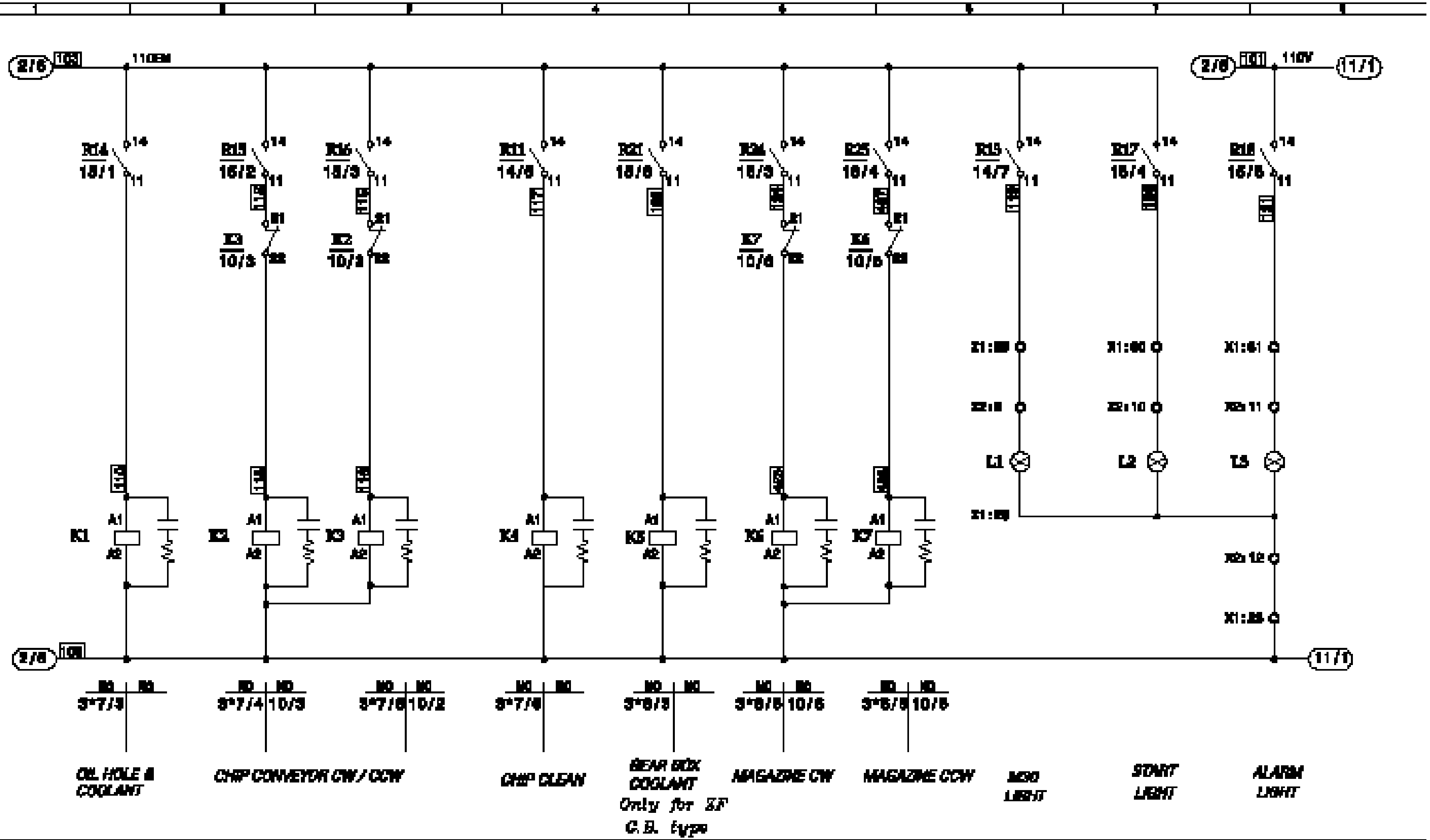
Pg. 7



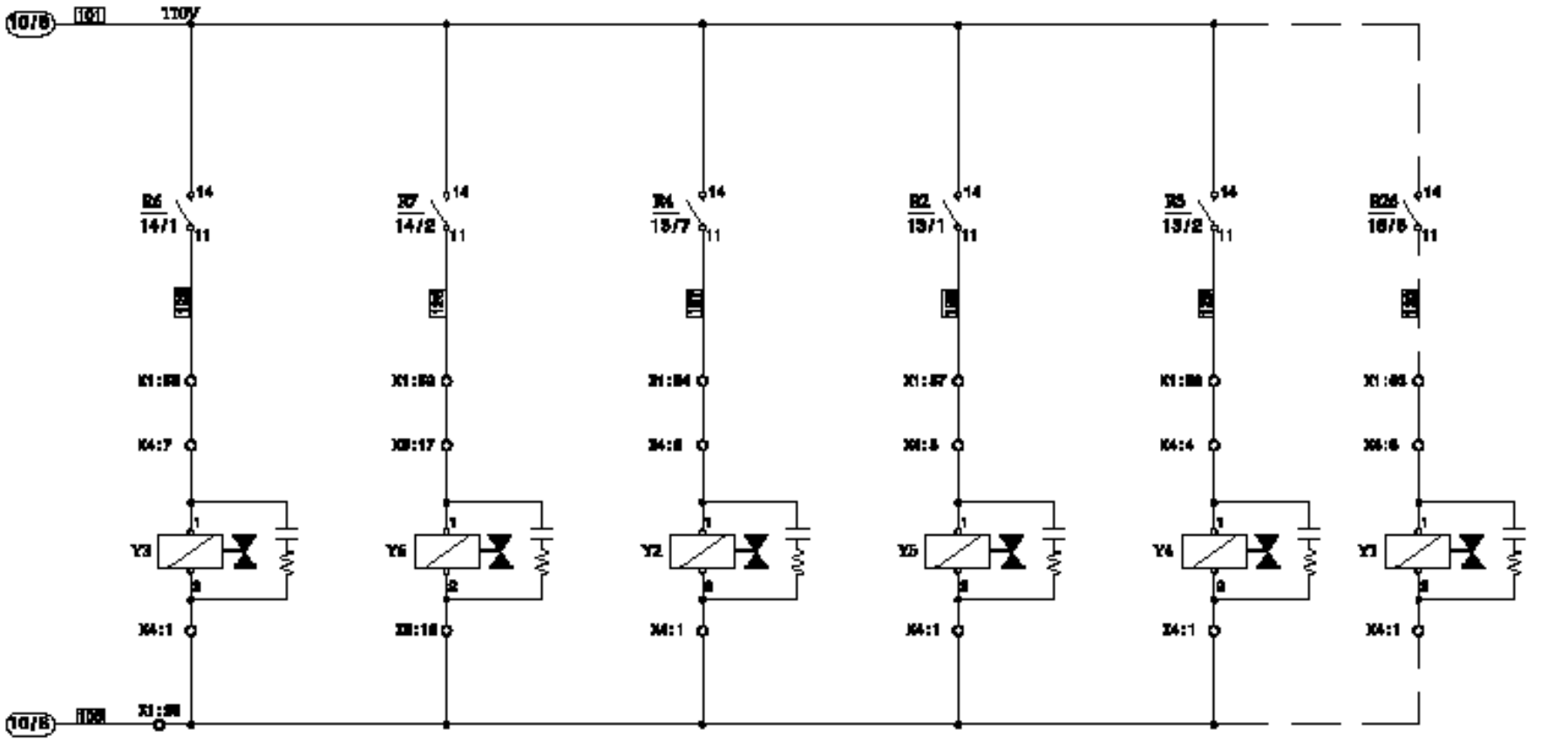
TITLE	AC MOTORS
	REPEATED TYPE:181,182,286
	203-36-006
TYPE	VMC 1250 SIEMENS802Dsl



TITLE	Z BRKE & MOTORS
	REPEATED TYPE:181,182,288
	203-36-006
TYPE	VMC 126/SIEMENS802Del



TITLE	MOTORS COMMAND
	203-36-006
REPEATED TYPE:181,182,288	
TYPE	VMC 125(SIEMENS)(2Da)
Pg.	10



ALTERATION	DATE	APPROVED	DATE	DRAWN	CHECKED	ENGINEER	CHECKED	APPROVED	DATE	ENGINEER	

TITLE: SOL COMMAND

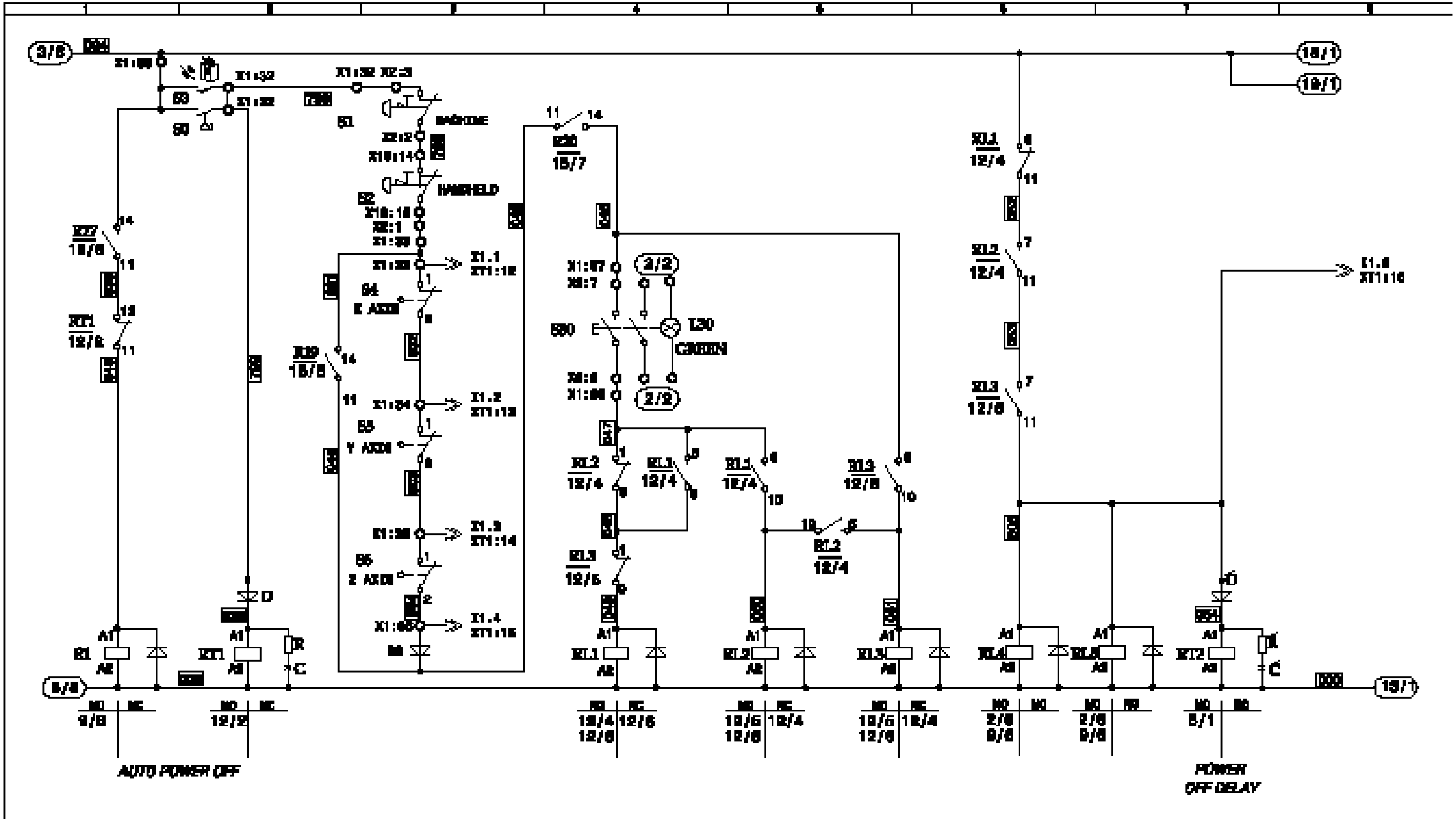
REPEATED TYPE:181,182,288

203-36-006

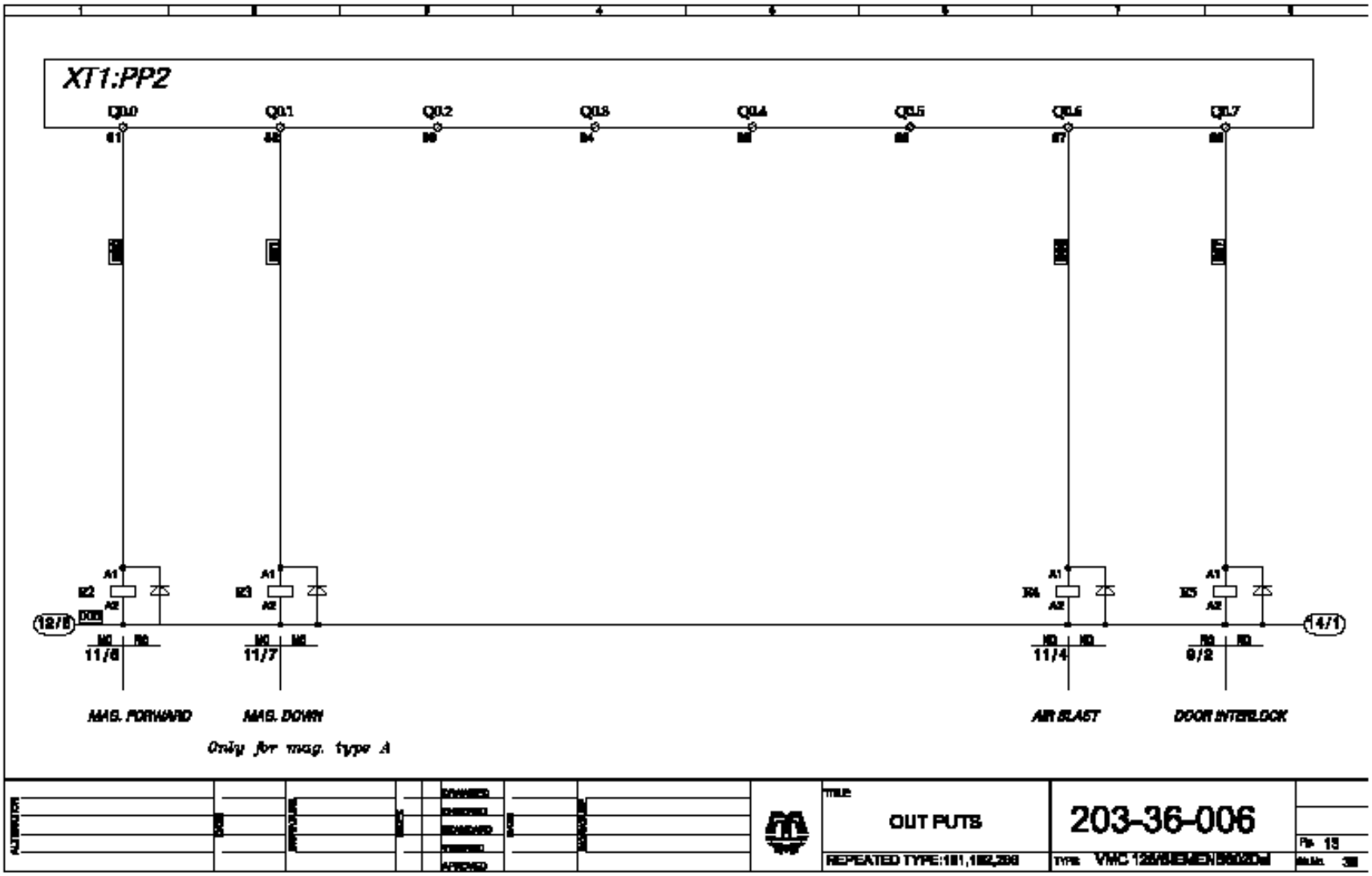
TYPE: VMC 125/8SIEMENS802Dsl

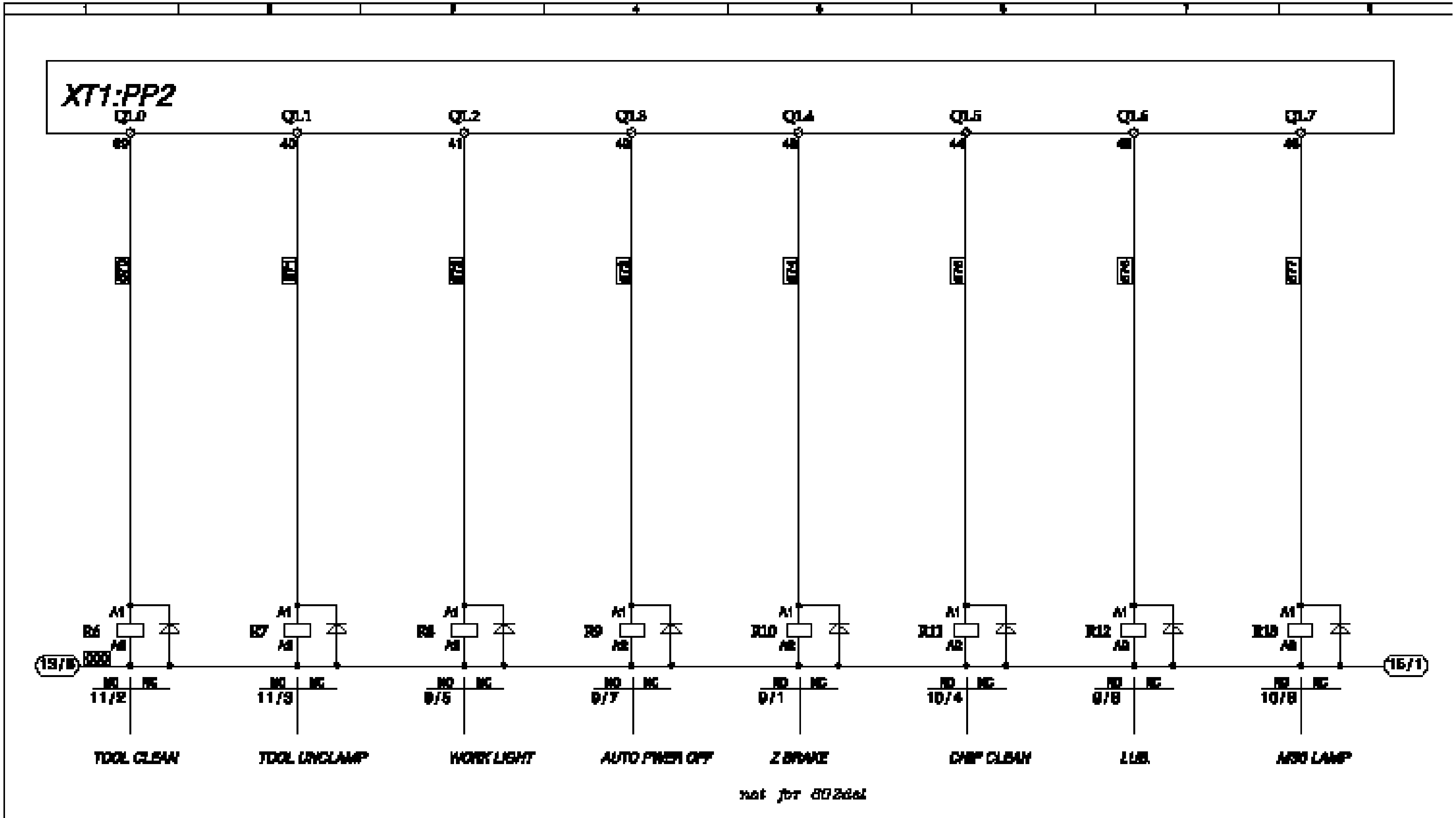
Pg. 11

MAIN. 38

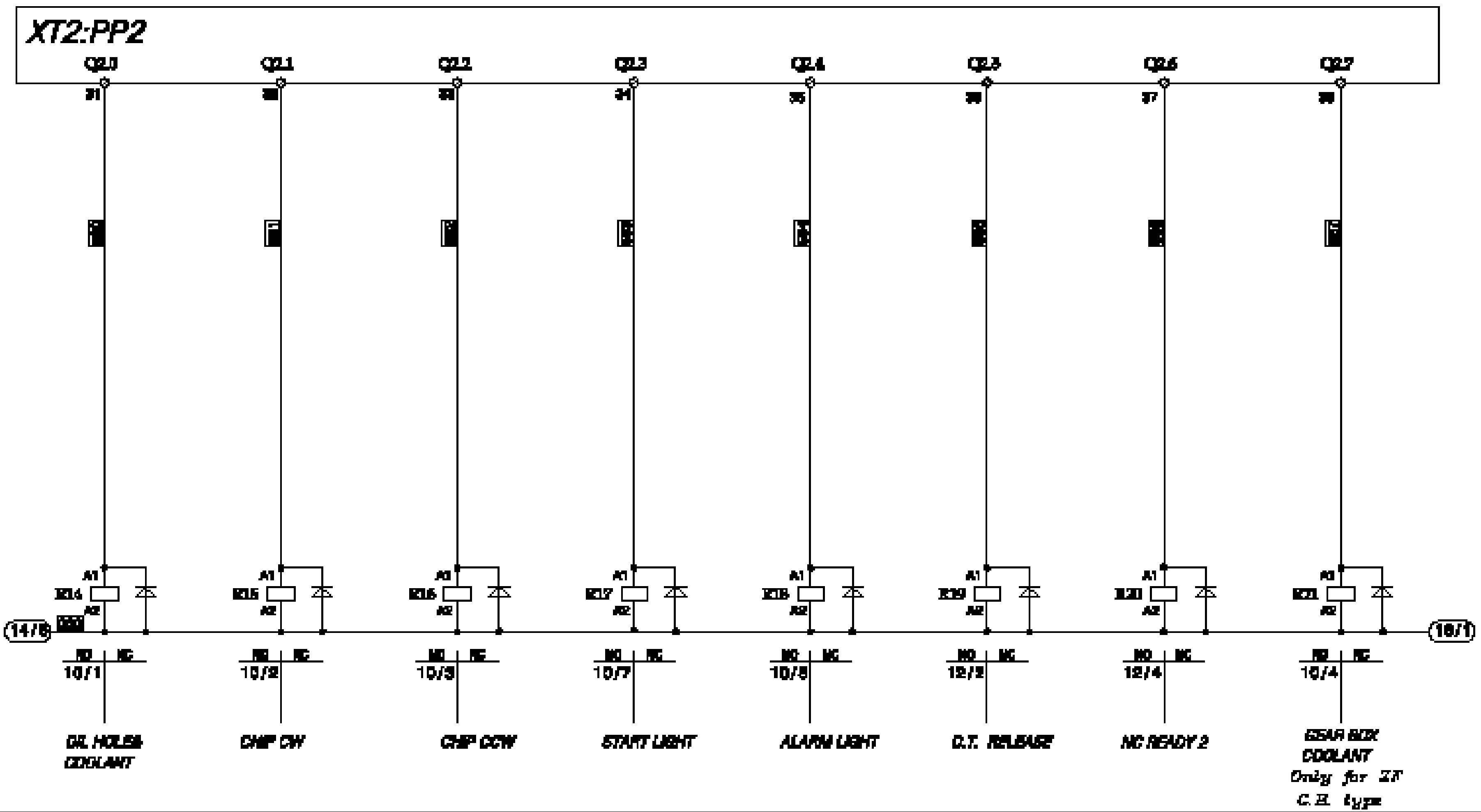


TITLE:	EMERGENCY
REPEATED TYPE: 181,182,288	
	203-36-006
TYPE:	VMC 125/SIEMENS802Dsl
Pg.	12


XT1:PP2
Q0.0
Q0.1
Q0.2
Q0.3
Q0.4
Q0.5
Q0.6
Q0.7
41
42
43
44
45
46
47
48
A1
A2
K2
K3
K4
K5
12/8
DOOR
14/1
11/6
11/7
11/4
9/2
MAG. FORWARD
MAG. DOWN
AIR BLAST
DOOR INTERLOCK
Only for mag. type A
OUT PUTS
203-36-006
REPEATED TYPE:181,182,288



TITLE	OUT PUTS
REPEATED TYPE:181,182,280	
	203-36-006
TYPE	VMC 1250 SIEMENS802Del
Fo.	14



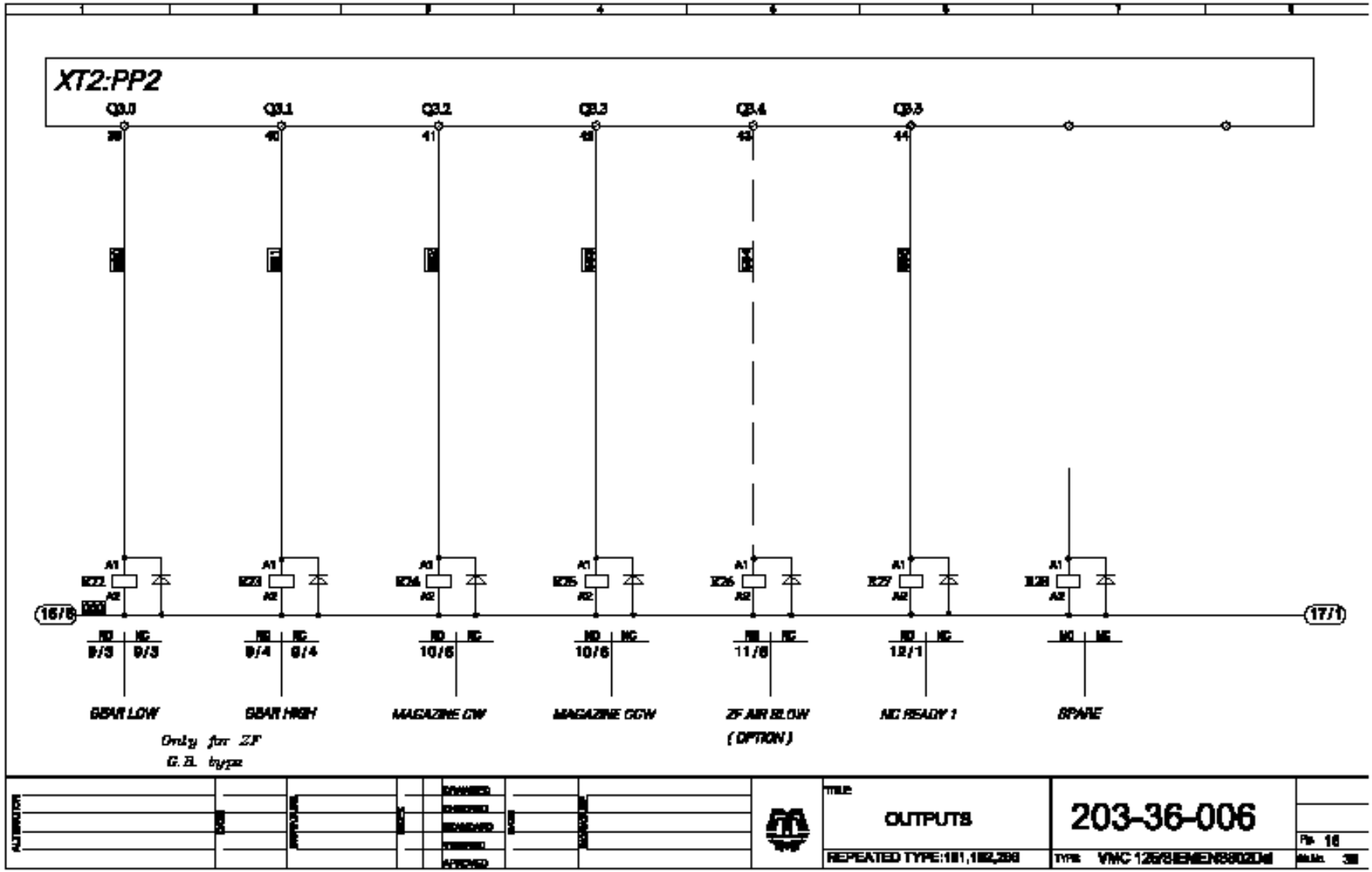
TITLE: OUT PUTS

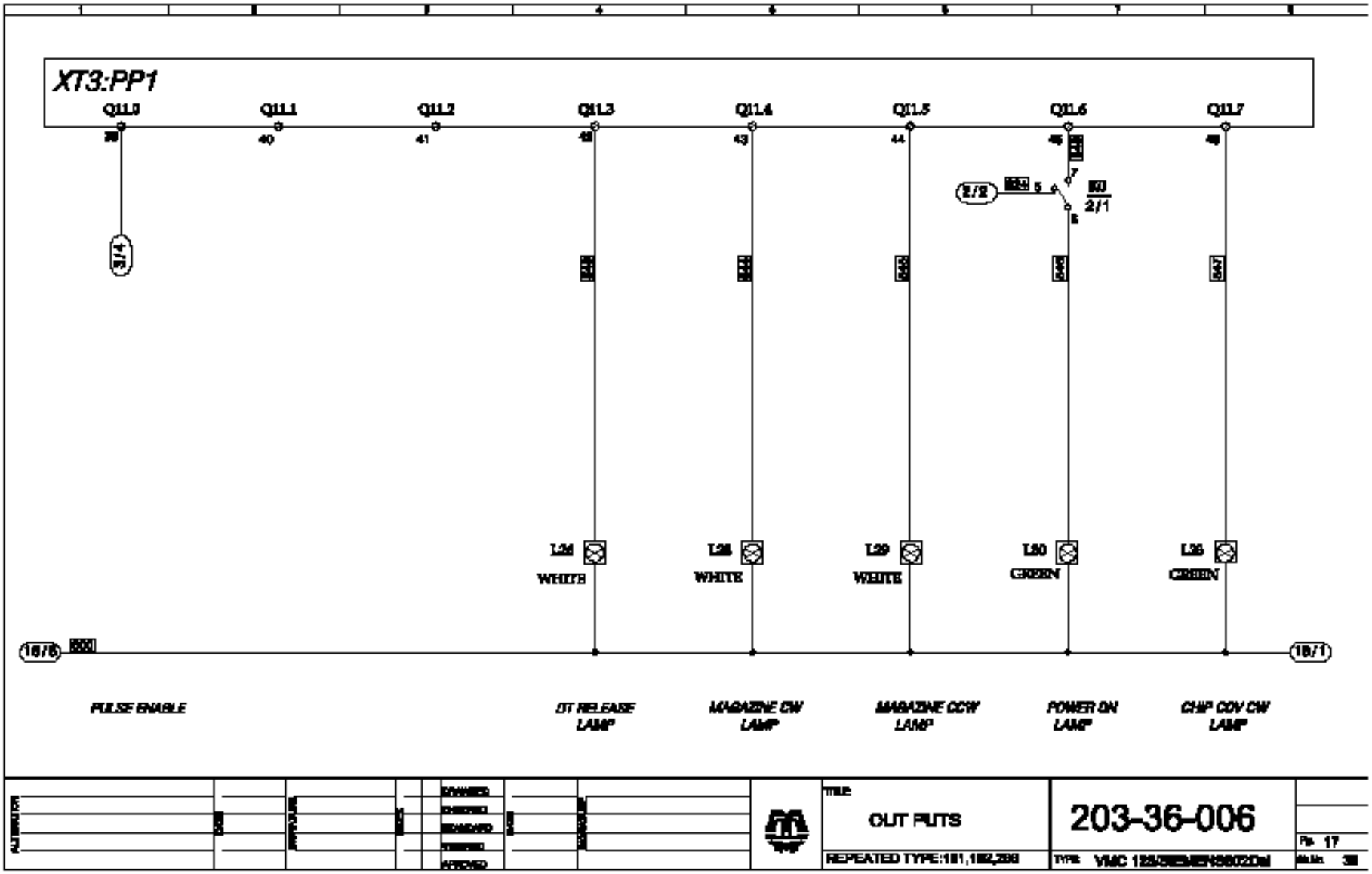
REPEATED TYPE:181,182,200

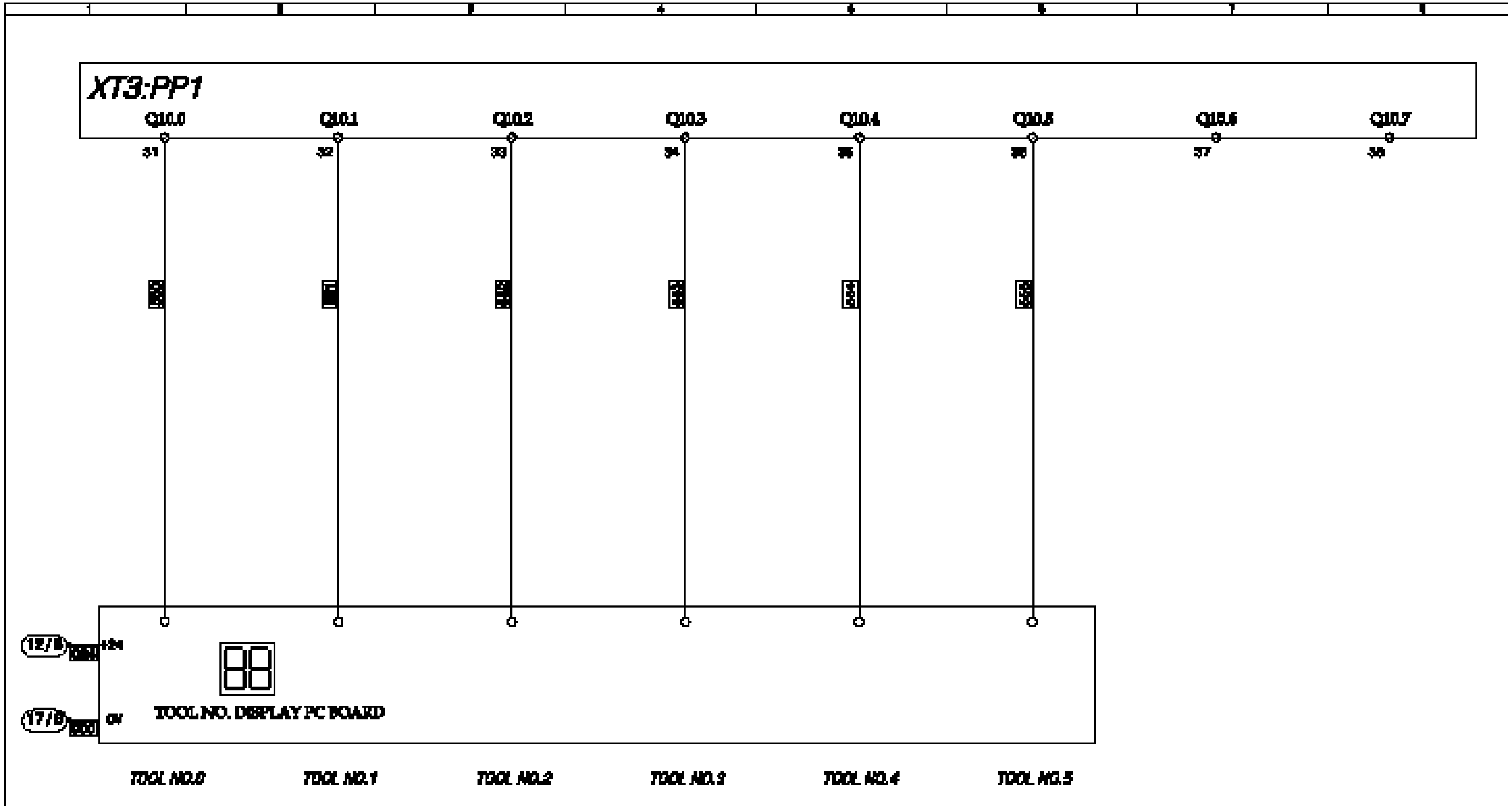
203-36-006

TYPE VMC 125/SIEMENS802D

Fo. 18

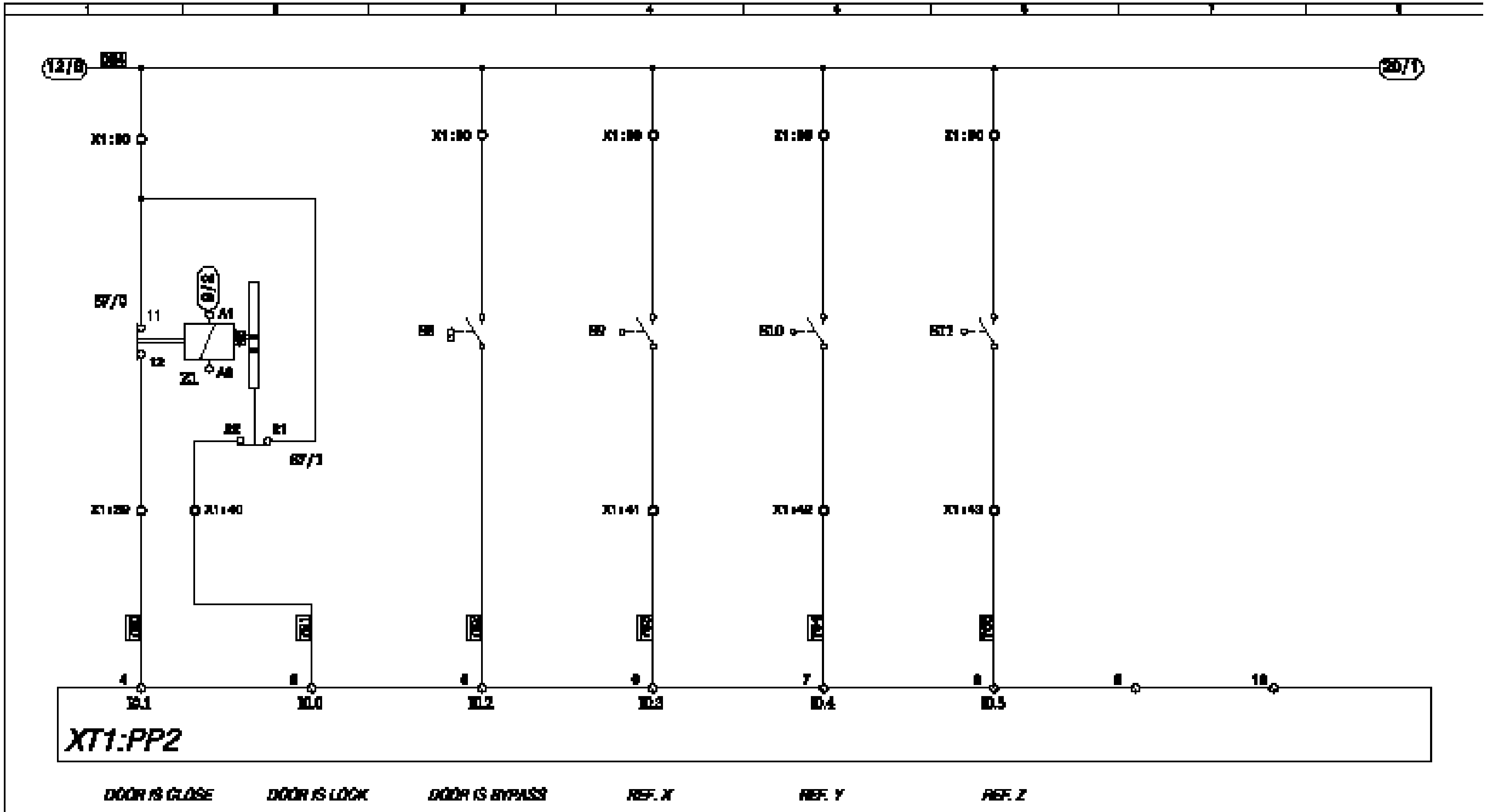

XT2:PP2
Q3.0
Q3.1
Q3.2
Q3.3
Q3.4
Q3.5
39
40
41
42
43
44
A1
A2
K23
K24
K25
K26
K27
K28
16/5
17/1
NO
NC
9/3
9/3
9/4
9/4
10/5
10/6
11/5
12/1
GEAR LOW
GEAR HIGH
MAGAZINE CW
MAGAZINE CCW
ZF AIR BLOW
(OPTION)
NC READY 1
SPARE
Only for ZF
G.B. type
TITLE
OUTPUTS
REPEATED TYPE:181,182,288
203-36-006
TYPE VMC 1268/SIEMENS802d
Pg. 16


XT3:PP1
Q11.0
Q11.1
Q11.2
Q11.3
Q11.4
Q11.5
Q11.6
Q11.7
38
40
41
42
43
44
45
46
47
3/4
2/2
2/1
L26
WHITE
L28
WHITE
L29
WHITE
L30
GREEN
L36
GREEN
18/6
18/1
PULSE ENABLE
DT RELEASE LAMP
MAGAZINE CW LAMP
MAGAZINE CCW LAMP
POWER ON LAMP
CHIP CDV CW LAMP
CUT PUTS
203-36-006
REPEATED TYPE:181,182,298
Pg 17



TITLE
OUT PUTS
TOOL NUMBER DISPLAY

203-36-006



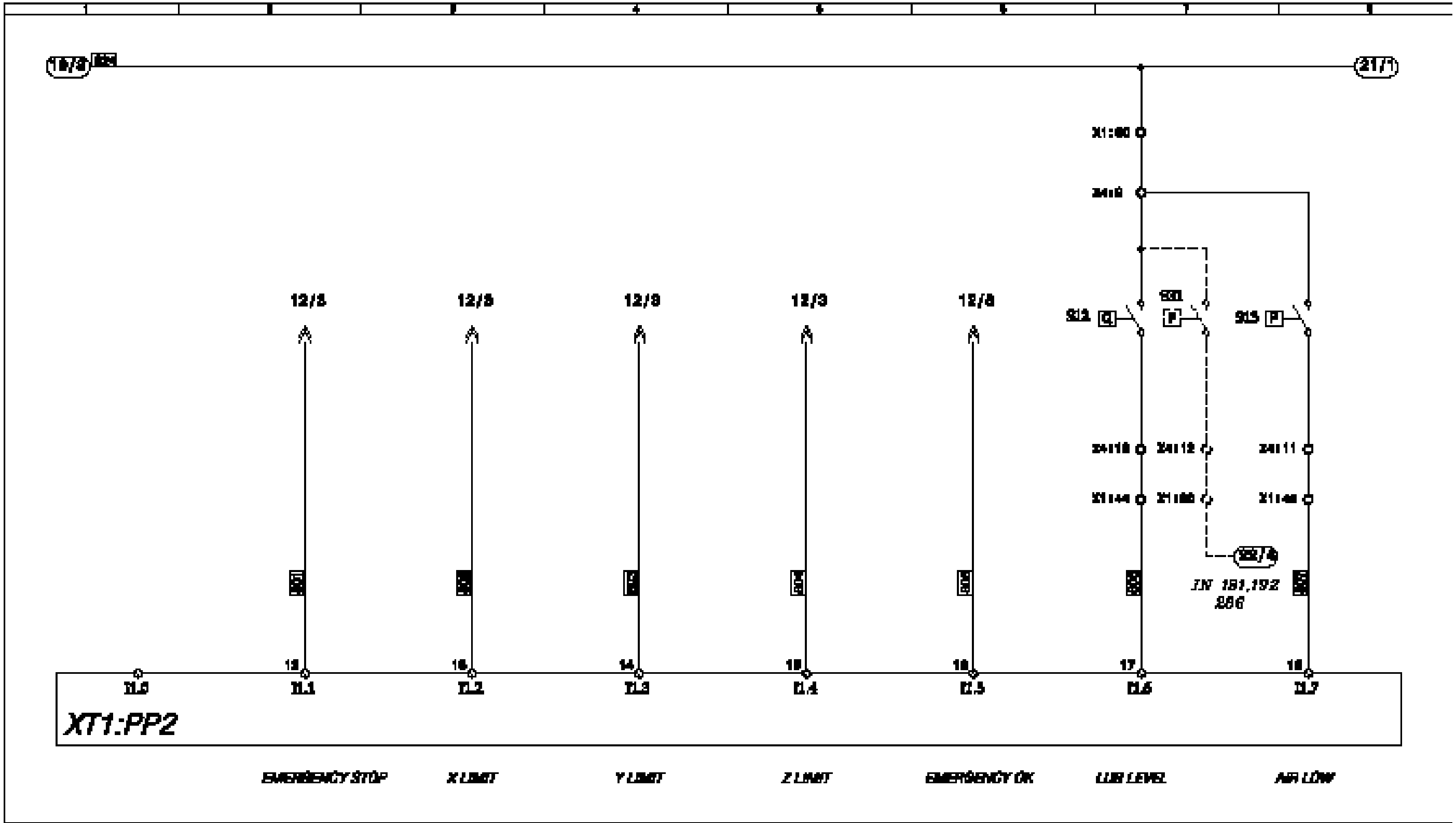
TITLE: INPUTS

REPEATED TYPE:181,182,200

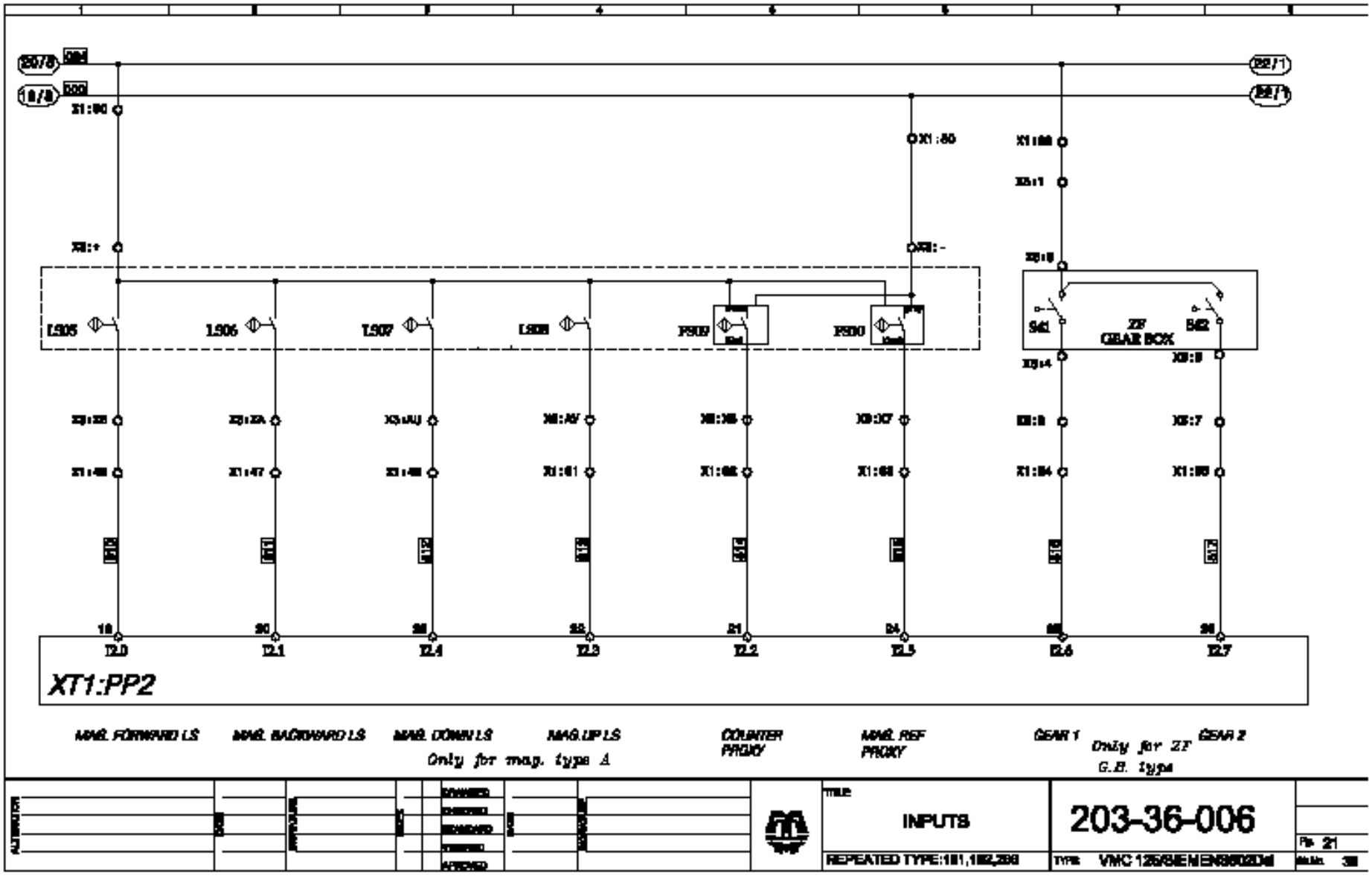
203-36-006

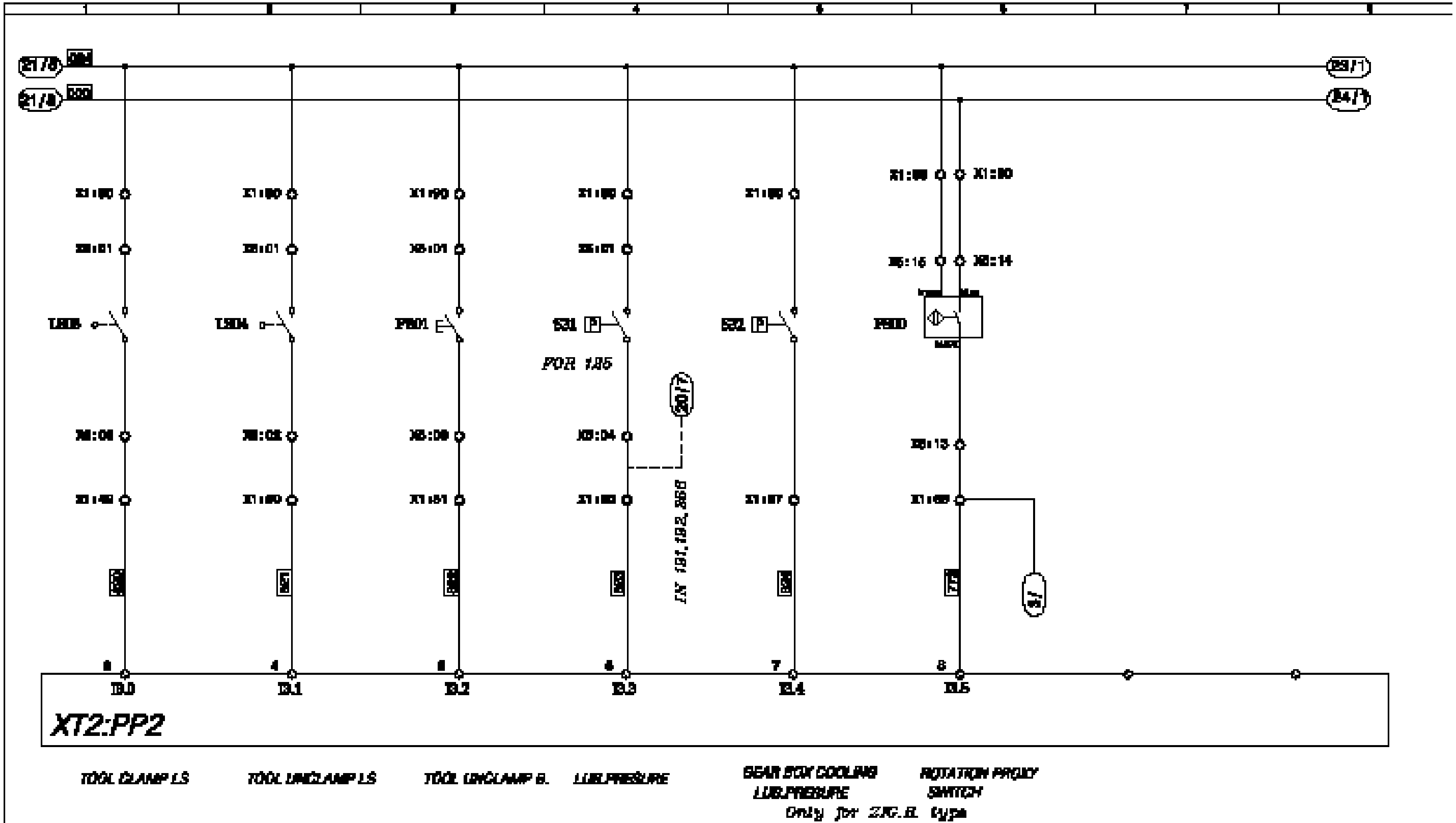
TYPE VMC 1250/8|EMENB002DM

Fo 19



TITLE	INPUTS
REPEATED TYPE:191,192,286	
	203-36-006
TYPE	VMC 126/SIEMENS802Dsl
Pa	20


XT1:PP2
MAG. FÖRWARD LS
MAG. BACKWARD LS
MAG. DOWN LS
MAG.UP LS
Only for mag. type A
COUNTER PROXY
MAG. REF PROXY
GEAR 1
GEAR 2
Only for ZF G.B. type
ZF GEAR BOX
S41
S42
INPUTS
203-36-006
REPEATED TYPE:181,182,288
VMC 125/SIEMENS802D



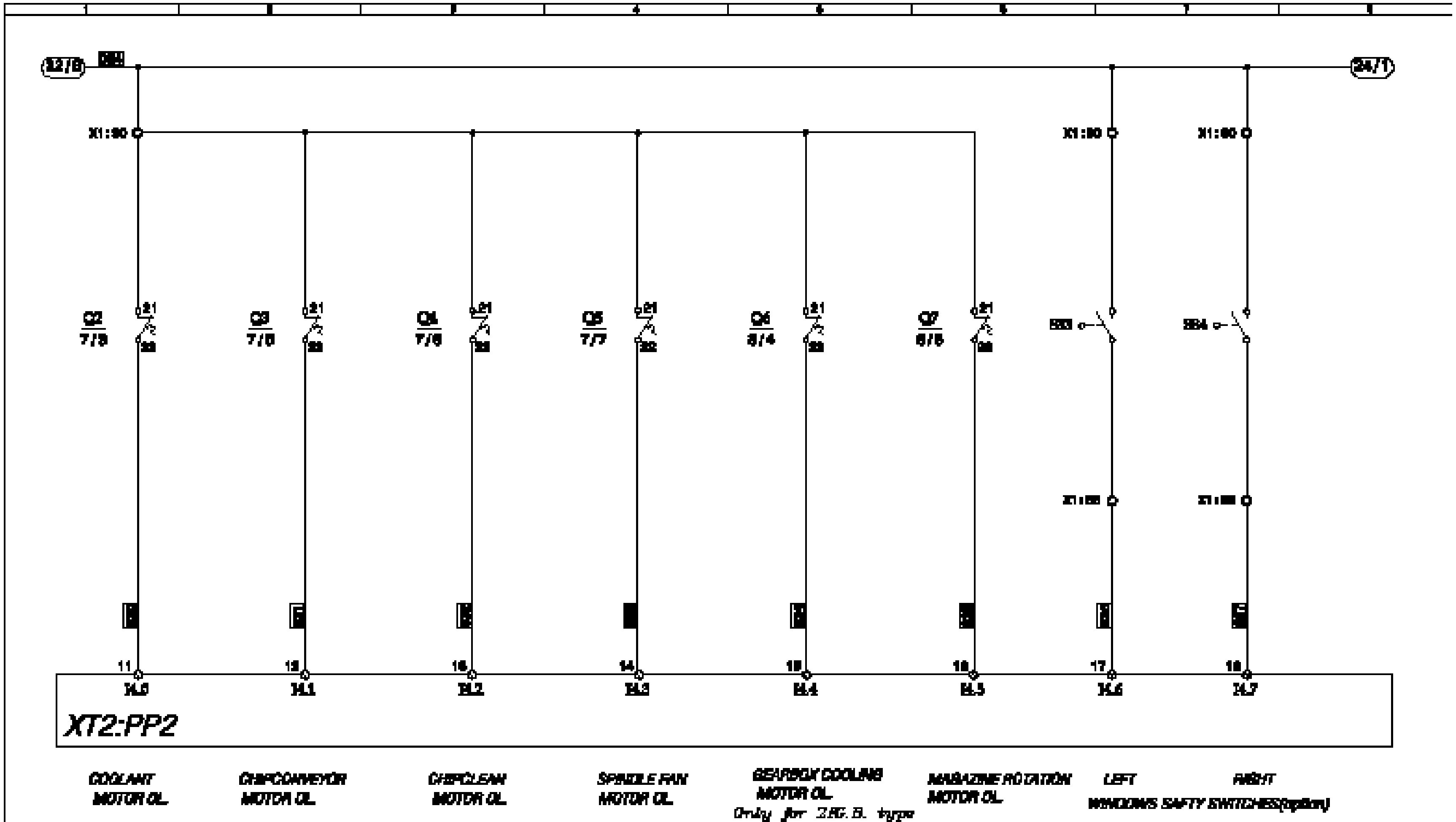
TITLE: INPUTS

203-36-006

REPEATED TYPE:181,182,268

TYPE: VMC 125/SIEMENS802D

Pr. 22

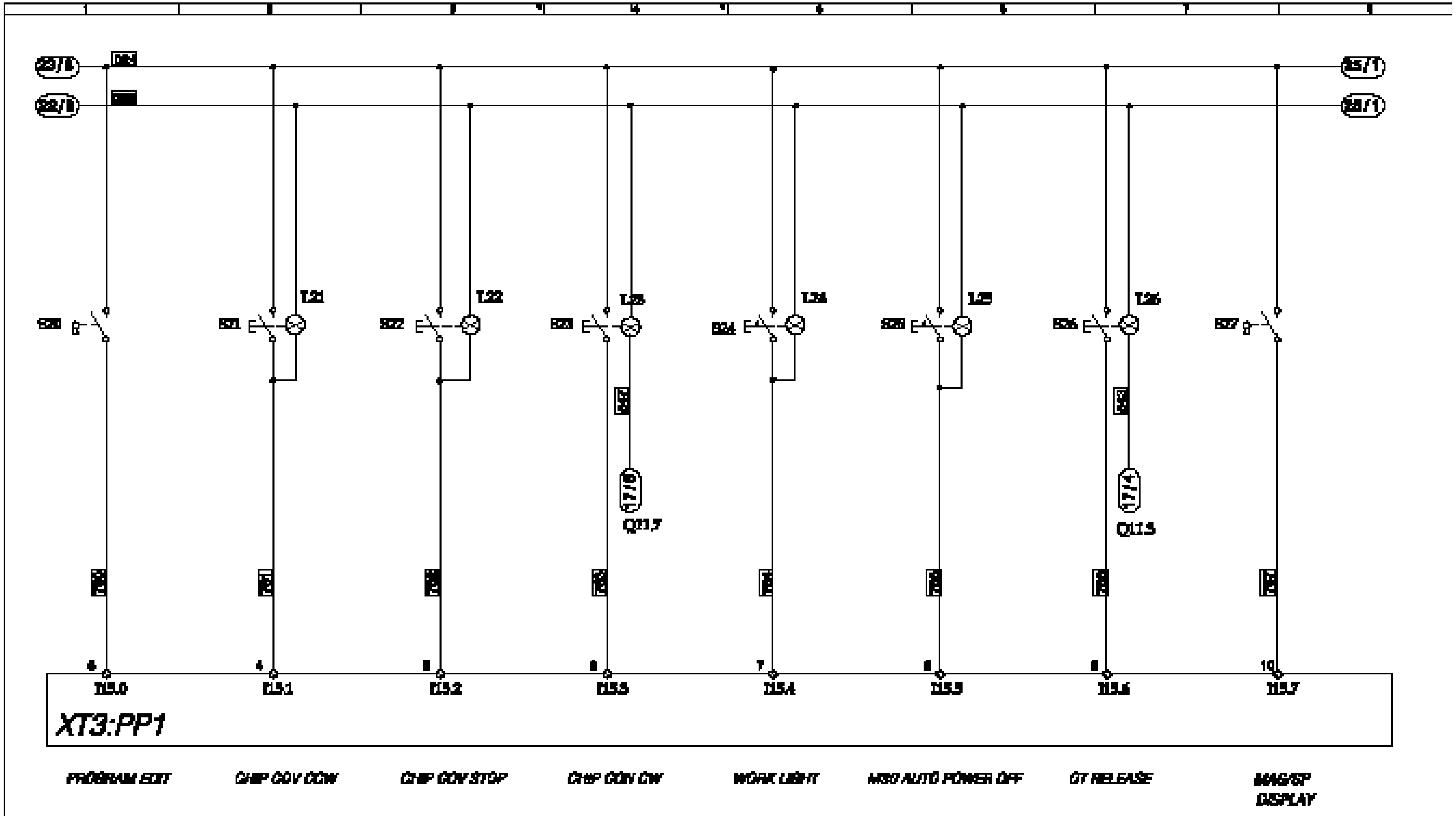


TITLE: INPUTS MOTORS OVERLOAD

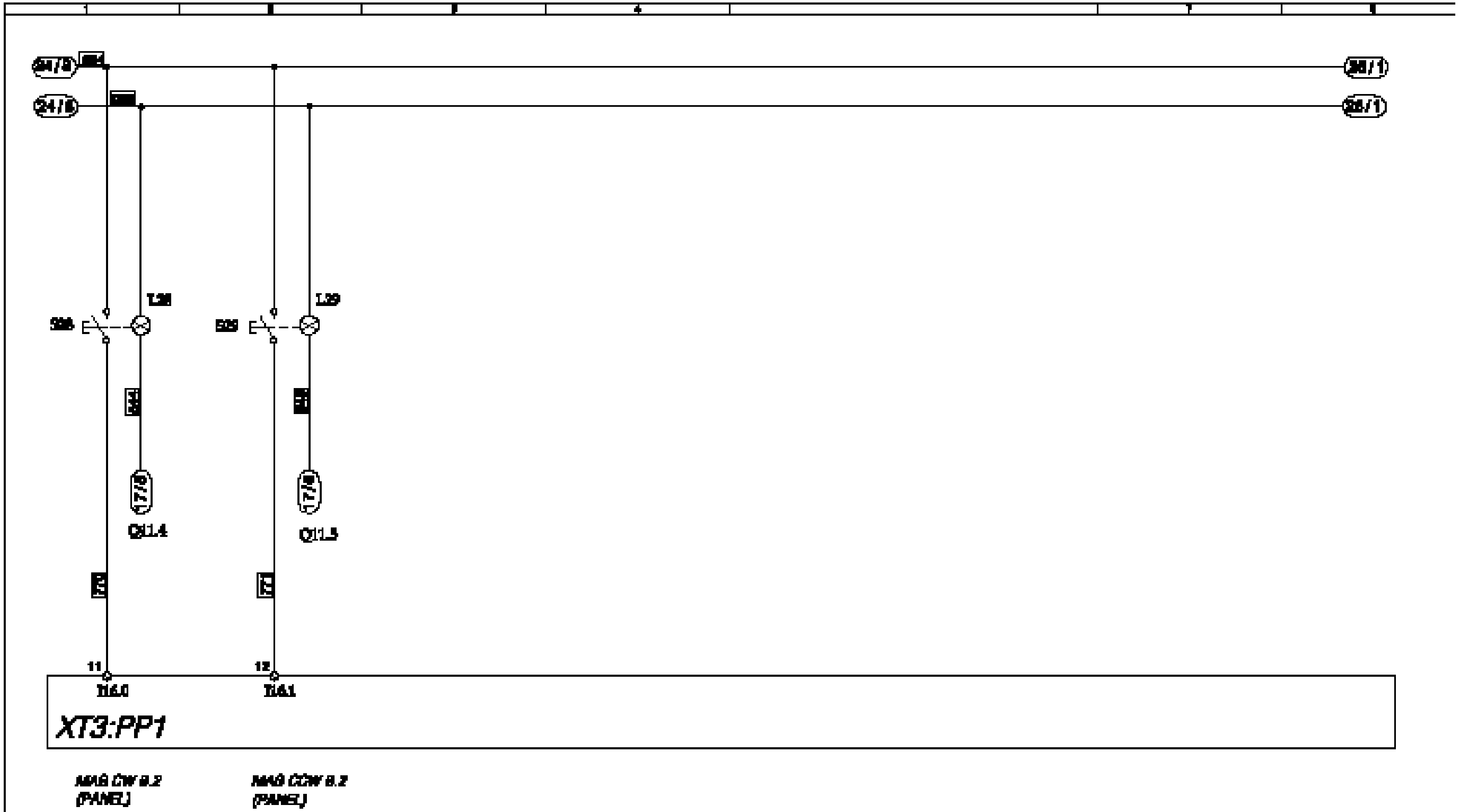
203-36-006

REPEATED TYPE:181,182,288

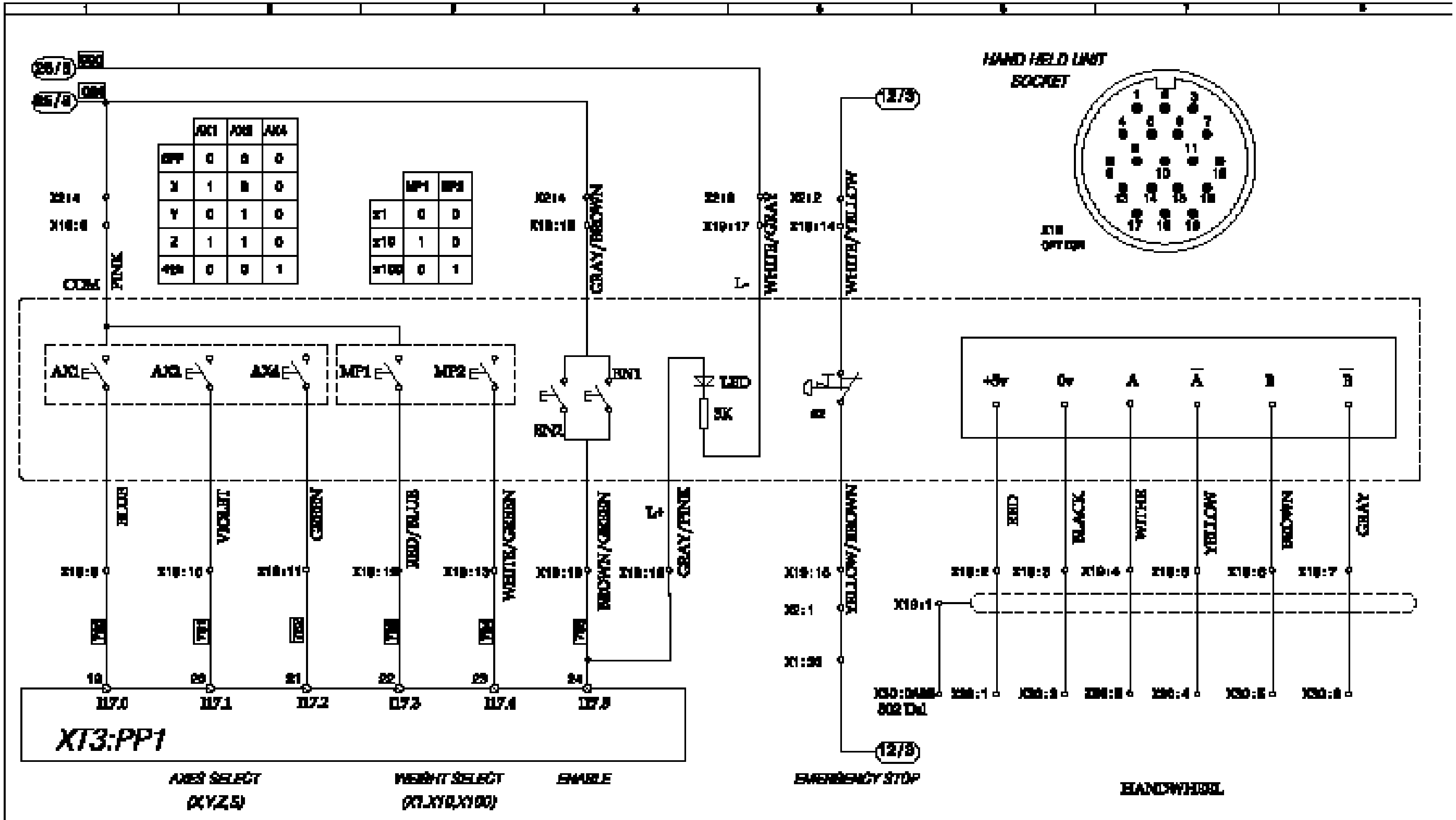
TYPE: VMC 1280/SIEMENS802DM



TITLE	INPUTS
REPEATED TYPE:181,182,200	
203-36-006	
TYPE	VMC 12/6/SIEMENS802DM
Pa.	24



TITLE	INPUTS
REPEATED TYPE:181,182,280	
203-36-006	
TYPE	VMC 125/8 EMENB602D
Pa	26



	AX1	AX2	AX4
OFF	0	0	0
X	1	0	0
Y	0	1	0
Z	1	1	0
4th	0	0	1

	MP1	MP2
x1	0	0
x10	1	0
x100	0	1

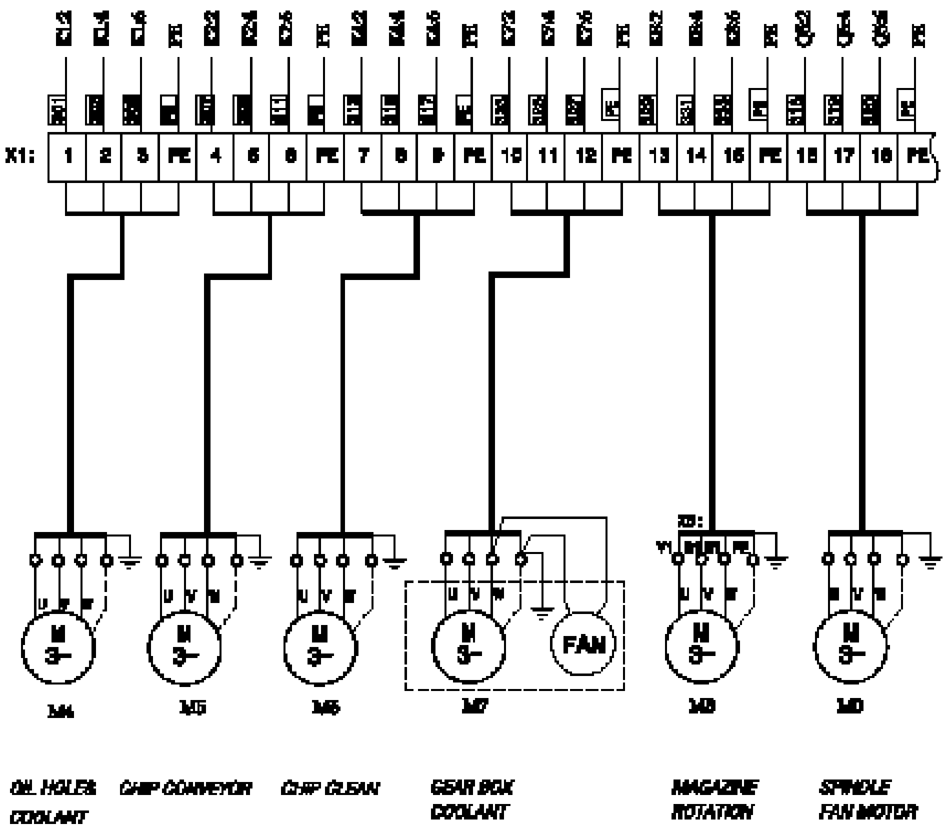
TITLE

INPUTS
HAND HELD UNIT

203-36-006

REPEATED TYPE:181,182,288

TYPE VMC 1280/EMENB802Dsl



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

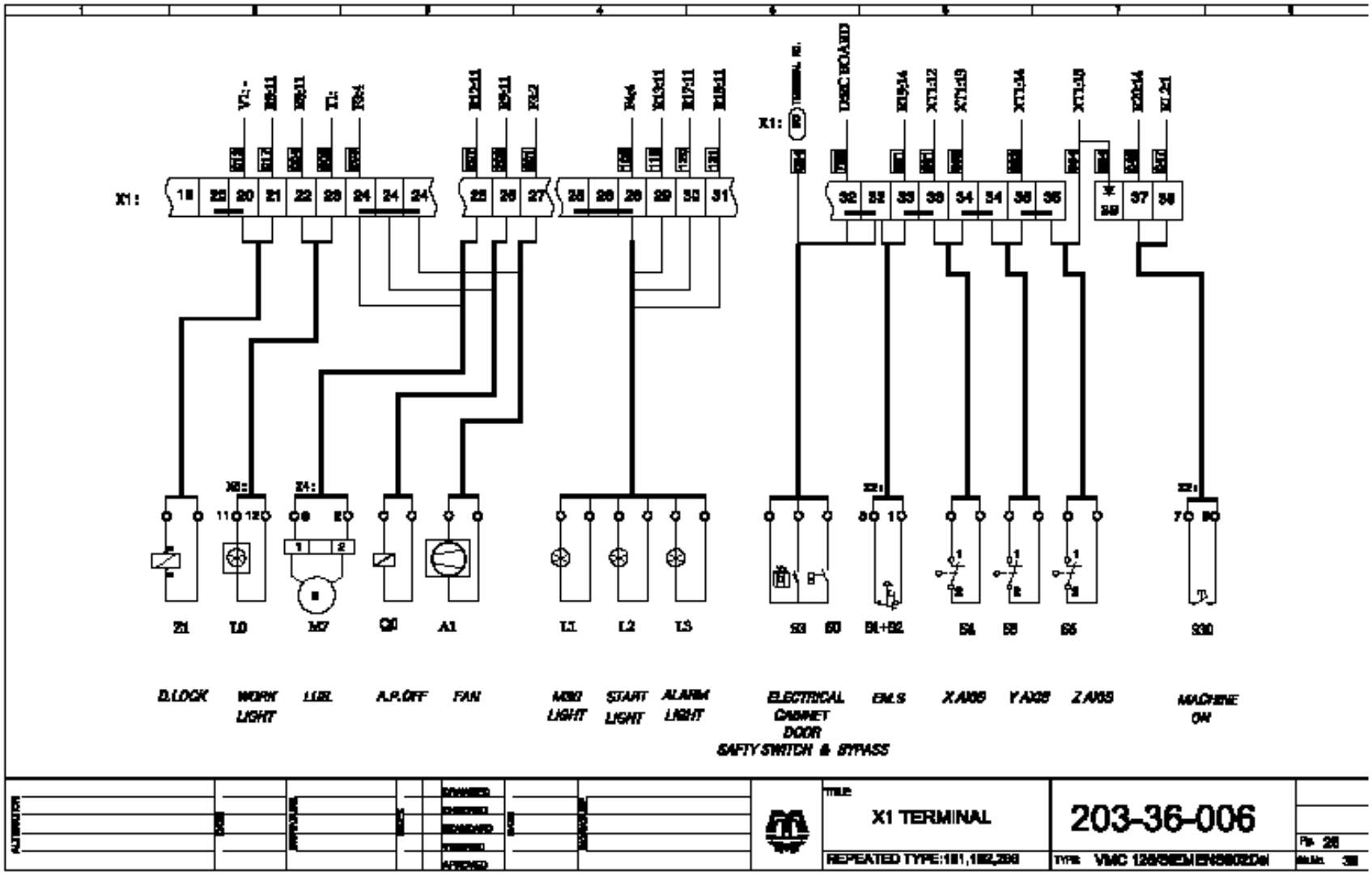
TITLE: X1 TERMINAL

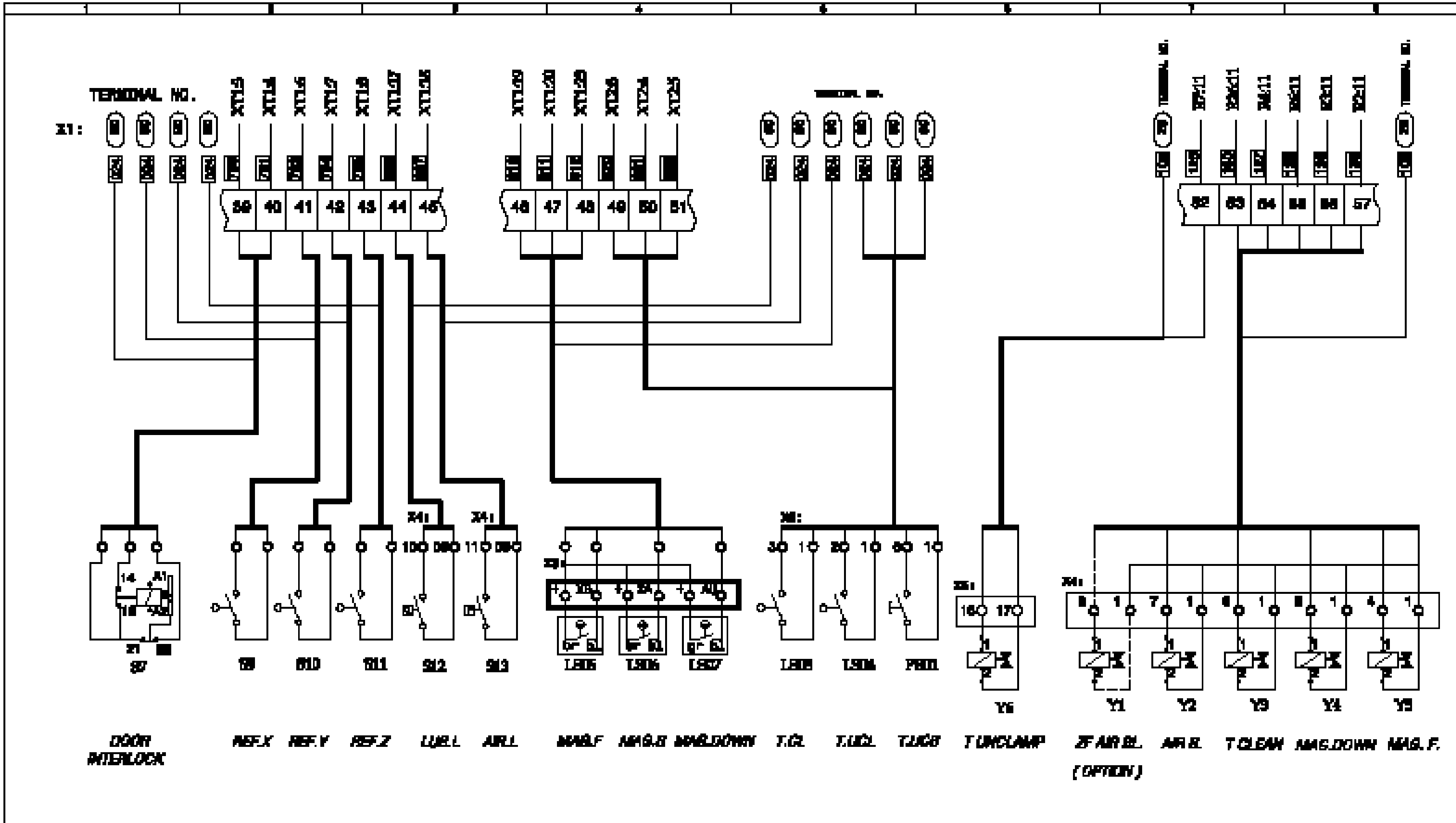
REPEATED TYPE:181,182,208

203-36-006

TYPE: VMC 1200 EMEN8602DM

Pa 27


X1 :
Z1
T.D
M7
Q0
A1
T.1
T.2
T.3
S3
S0
S1+S2
S4
S5
S6
S30
D.LOCK
WORK LIGHT
LUB.
A.P.OFF
FAN
MDI LIGHT
START LIGHT
ALARM LIGHT
ELECTRICAL CABINET DOOR SAFTY SWITCH & BYPASS
EM.S
X AXIS
Y AXIS
Z AXIS
MACHINE ON
X1 TERMINAL
203-36-006
REPEATED TYPE:181,182,200

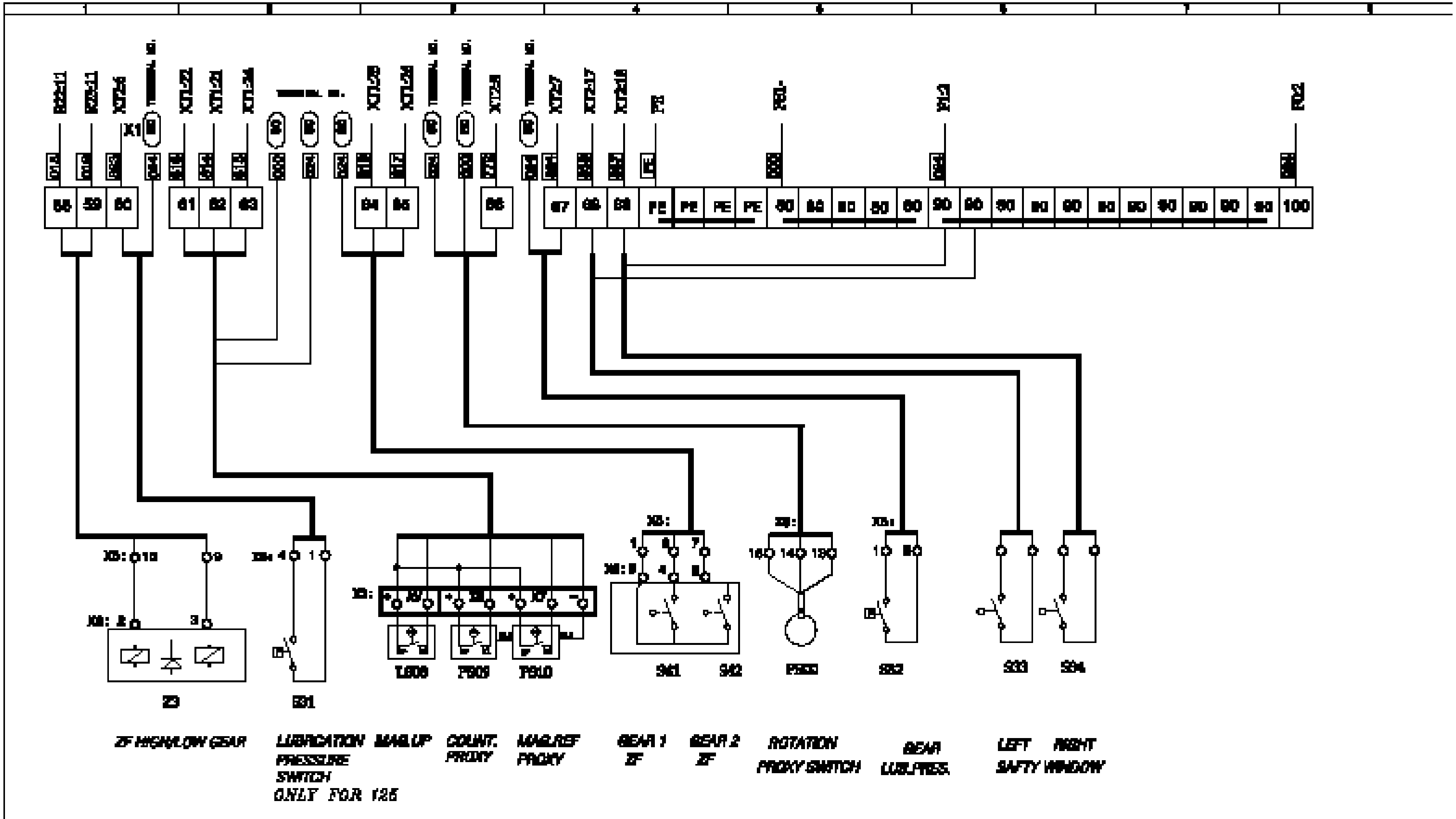


TITLE: X1 TERMINAL

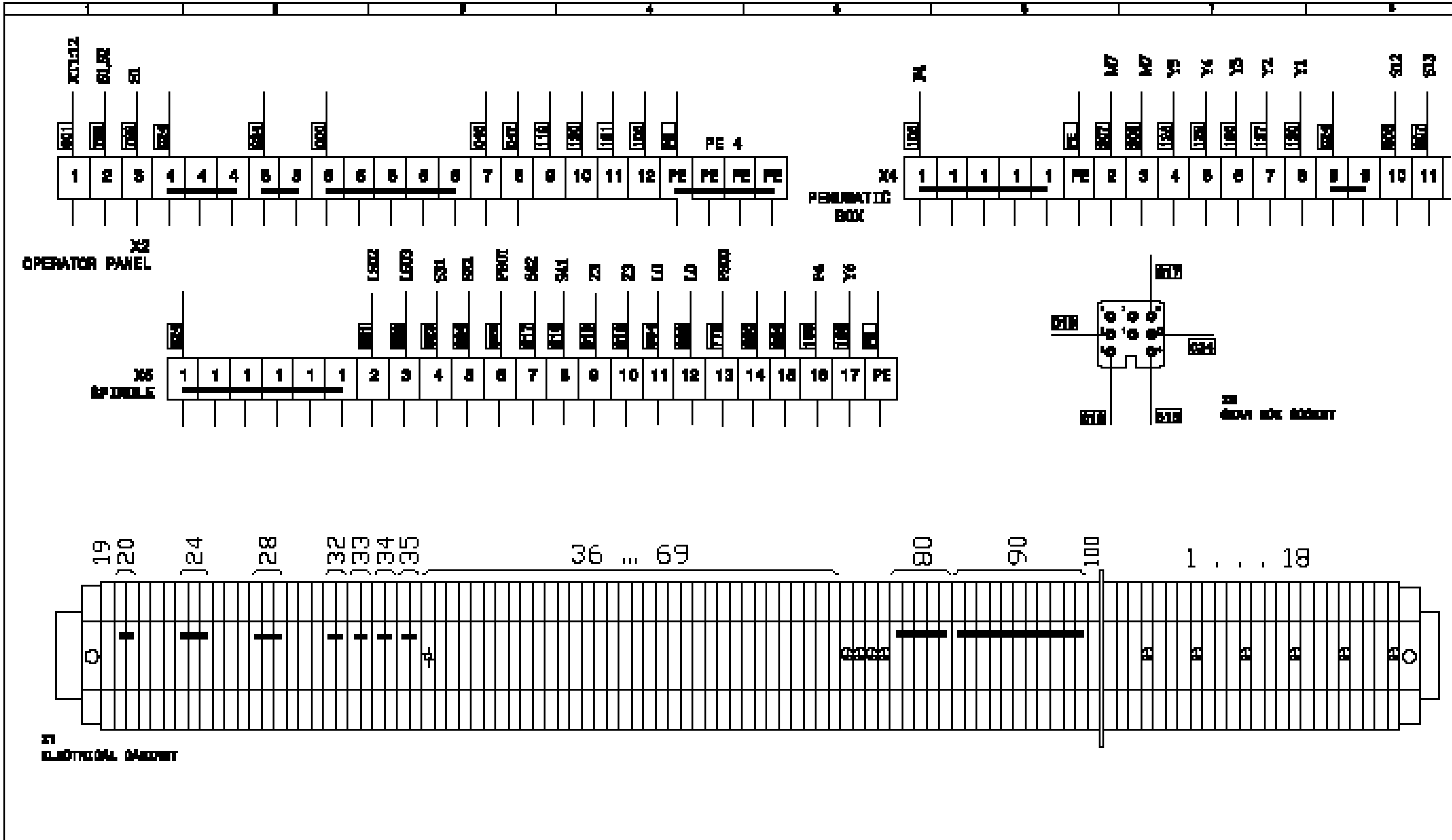
REPEATED TYPE:181,182,288

203-36-006

TYPE: VMC 1250/EMEN002Dal



TITLE	X1 TERMINAL
	203-36-006
REPEATED TYPE:	181,182,288
TYPE	VMC 125/SIEMENS802D



TITLE

X2,X4,X5 TERMINALS

REPEATED TYPE:181,182,280

203-36-006

TYPE VMC 1200 SIEMENS802D

DRAWED

CHECKED

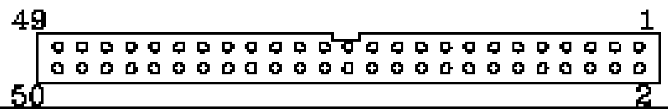
STANDARD

APPROVED

RESERVE

ALTERATION	DATE	SIGNATURE	DATE	DRAWN / CHECKED / STANDARD / VERIFIED / APPROVED	DATE	SIGNATURE	TITLE	203-36-006	
							REPEATED TYPE:[illegible]	TYPE VMC [illegible]	[illegible]

PP1
X333



A					B				
PIN	ADDRESS	NO.	NAME	pos	PIN	ADDRESS	NO.	NAME	pos
1	GND	000	DC0		2	+24V		UNUSED	
3	I 15.0	760	EDIT KEY		4	I 15.1	761	CHIP.CCW	
5	I 15.2	762	CHIP.STOP		6	I 15.3	763	CHIP.CW	
7	I 16.4	764	WORK LIGHT		8	I 16.5	765	M30.APO	
9	I 16.6	766	OT.RELEASE		10	I 16.7	767	MG/SP	
11	I 16.0	770	MAG. CW		12	I 16.1	771	MAG. CCW	
13	I 16.2				14	I 16.3			
15	I 16.4				16	I 16.5			
17	I 16.6				18	I 16.7			
19	I 17.0	780	AX1		20	I 17.1	761	AX2	
21	I 17.2	782	AX3		22	I 17.3	763	MP1	
23	I 17.4	784	MP2		24	I 17.5	785	ENABLE	
25	I 17.6				26	I 17.7			
27					28				
29					30				
31	Q10.0	550	TN.0		32	Q10.1	551	TN1	
33	Q10.2	552	TN.2		34	Q10.3	553	TN3	
35	Q10.4	554	TN.4		36	Q10.5	555	TN.5	
37	Q10.6	556			38	Q10.7	557		
39	Q11.0	540	PULSE EN		40	Q11.1	541		
41	Q11.2	542			42	Q11.3	543	BY PASS	
43	Q11.4	544	MAG CW		44	Q11.5	545	MAG CCW	
45	Q11.6	546	POWER ON		46	Q11.7	547	CHIP CW	
47	DOCOM1	024	DC24		48	DOCOM1	024	DC24	
49	DOCOM1	024	DC24		50	DOCOM1	024	DC24	

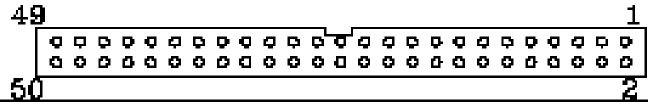
TITLE I/O TABLE PP72/48 1

REPEATED TYPE:181,182,288

203-36-006

TYPE VMC 120/SIEMENS802Dsl

PP2
X111



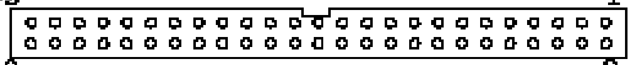
A					B				
PIN	ADDRESS	NO.	NAME	pos	PIN	ADDRESS	NO.	NAME	pos
1	GND	000	DC0		2	+24V		UNUSED	
3	I 0.0	790	DOOR CLOSE		4	I 0.1	791	DOOR LOCK	
5	I 02	792	DOOR BYPASS		6	I 0.3	793	REF. X	
7	I 0.4	794	REF. Y		8	I 0.5	795	REF. Z	
9	I 0.6				10	I 0.7			
11	I 1.0	800	IR READY		12	I 1.1	801	EMERG.STOP	
13	I 1.2	802	X LIMIT		14	I 1.3	803	Y LIMIT	
15	I 1.4	804	Z LIMIT		16	I 1.5	805	EMERG. OK	
17	I 1.6	806	LUB LEVEL		18	I 1.7	807	AIR LOW	
19	I 2.0	810	MAG. FORW.		20	I 2.1	811	MAG.BACKW.	
21	I 2.2	814	MAG.COUNT.		22	I 2.3 #	813	MAG. UP	
23	I 2.4 #	812	MAG.DOWN		24	I 2.5	815	MAG. REF.	
25	I 2.6 *	816	GEAR 1		26	I 2.7 *	817	GEAR 2	
27					28				
29					30				
31	Q 0.0	560	MAG. FORW.		32	Q 0.1 #	561	MAG. DOWN	
33	Q 0.2				34	Q 0.3			
35	Q 0.4				36	Q 0.5			
37	Q 0.6	566	AIR BLAST		38	Q 0.7	567	DOORINT.LOCK	
39	Q1.0	570	TOOL CLEAN		40	Q1.1	571	TOOL UNCLAMP	
41	Q1.2	572	WORK LIGHT		42	Q1.3	573	AUTO POWEROFF	
43	Q1.4	574	Z BRAKE		44	Q1.5	575	CHIP CLEAN	
45	Q1.6	576	LUBRICATION		46	Q1.7	577	M30 LAMP	
47	DOCOM1	024	DC24		48	DOCOM1	024	DC24	
49	DOCOM1	024	DC24		50	DOCOM1	024	DC24	

*: Only for ZF G.B. type

#: Only for mag. type A

TITLE	I/O TABLE PP72/48 2
	REPEATED TYPE:181,182,288
203-36-006	
TYPE	VMC 120/SIEMENS802D

PP2
X222



A					B				
PIN	ADDRESS	NO.	NAME	pos	PIN	ADDRESS	NO.	NAME	pos
1	GND	000	DC0		2	+24V		UNUSED	
3	I 3.0	820	TOOL CLAMP	LS	4	I 3.1	821	TOOL UNCLAMP	LS
5	I 3.2	822	TOOL UNCLAMP	P.B.	6	I 3.3	823	LUB.PRESURE	
7	I 3.4 *	824	LUB.PRESURE	G.B.	8	I 3.5	772	ROTAT.PROX.	SW.
9	I 3.6				10	I 3.7			
11	I 4.0	830	COOL. MOTOR	O.L.	12	I 4.1	831	CHIP.MOTOR	O.L.
13	I 4.2	832	CHIPCLEAN M.	O.L.	14	I 4.3	833	SP.FAN MOTOR	O.L.
15	I 4.4	834	G.B.COOL.MOTOR	O.L.	16	I 4.5	835	MAG.ROT.MOTOR	O.L.
17	I 4.6	836	SAFTY WIN.LEFT	OPTION	18	I 4.7	837	SAFTY WIN.RIGHT	OPTION
19	I 6.0				20	I 6.1			
21	I 6.2				22	I 6.3			
23	I 5.4				24	I 5.5			
25	I 5.6				26	I 5.7			
27					28				
29					30				
31	Q 2.0	580	COOLANT		32	Q 2.1	581	CHIP C.W.	
33	Q 2.2	582	CHIP C.C.W.		34	Q 2.3	583	START LAMP	
35	Q 2.4	584	ALARM LAMP		36	Q 2.5	585	O. T. RELASE	
37	Q 2.6	586	NC READY 2		38	Q 2.7 *	587	GEAR B. COOL.	
39	Q 3.0 *	590	GEAR LOW		40	Q 3.1 *	591	GEAR HIGH	
41	Q 3.2	592	MAG. C.W.		42	Q 3.3	593	MAG. C.C.W.	
43	Q 3.4 *	594	ZF AIR BLOW	OPTION	44	Q 3.5	595	NC READY 1	
45	Q 3.6				46	Q 3.7			
47	DOCOM1	024	DC24		48	DOCOM1	024	DC24	
49	DOCOM1	024	DC24		50	DOCOM1	024	DC24	

*: Only for ZF G.B. type

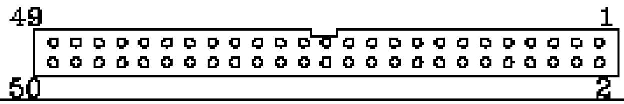
TITLE
I/O TABLE PP72/48 2

203-36-006

REPEATED TYPE:181,182,288

TYPE VMC [illegible]

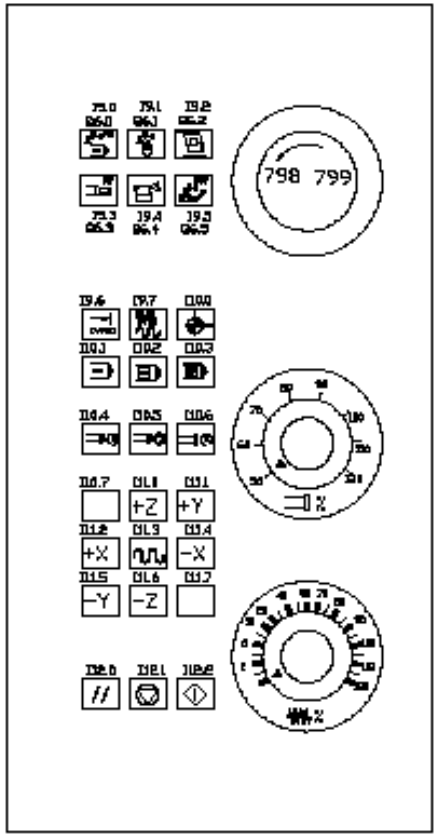
PP2
X222

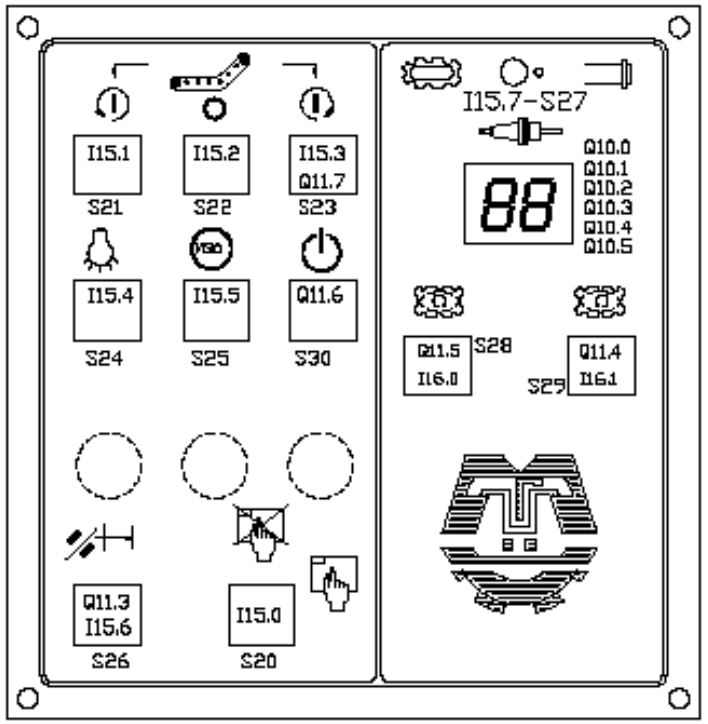


A					B				
PIN	ADDRESS	NO.	NAME	pos	PIN	ADDRESS	NO.	NAME	pos
1	GND	000	DC0		2	+24V		UNUSED	
3	I 3.0	820	TOOL CLAMP	LS	4	I 3.1	821	TOOL UNCLAMP	LS
5	I 3.2	822	TOOL UNCLAMP	P.B.	6	I 3.3	823	LUB.PRESURE	
7	I 3.4 *	824	LUB.PRESURE	G.B.	8	I 3.5	772	ROTAT.PROX.	SW.
9	I 3.6				10	I 3.7			
11	I 4.0	830	COOL. MOTOR	O.L.	12	I 4.1	831	CHIP.MOTOR	O.L.
13	I 4.2	832	CHIPCLEAN M.	O.L.	14	I 4.3	833	SP.FAN MOTOR	O.L.
15	I 4.4	834	G.B.COOL.MOTOR	O.L.	16	I 4.5	835	MAG.ROT.MOTOR	O.L.
17	I 4.6	836	SAFTY WIN.LEFT	OPTION	18	I 4.7	837	SAFTY WIN.RIGHT	OPTION
19	I 5.0				20	I 5.1			
21	I 5.2				22	I 5.3			
23	I 5.4				24	I 5.5			
25	I 5.6				26	I 5.7			
27					28				
29					30				
31	Q 2.0	580	COOLANT		32	Q 2.1	581	CHIP C.W.	
33	Q 2.2	582	CHIP C.C.W.		34	Q 2.3	583	START LAMP	
35	Q 2.4	584	ALARM LAMP		36	Q 2.5	585	O. T. RELASE	
37	Q 2.6	586	NC READY 2		38	Q 2.7 *	587	GEAR B. COOL	
39	Q 3.0 *	590	GEAR LOW		40	Q 3.1 *	591	GEAR HIGH	
41	Q 3.2	592	MAG. C.W.		42	Q 3.3	593	MAG. C.C.W.	
43	Q 3.4 *	594	ZF AIR BLOW	OPTION	44	Q 3.5	595	NC READY 1	
45	Q 3.6				46	Q 3.7			
47	DOCOM1	024	DC24		48	DOCOM1	024	DC24	
49	DOCOM1	024	DC24		50	DOCOM1	024	DC24	

*: Only for ZF G.B. type

TITLE
I/O TABLE PP72/48 2
203-36-006
REPEATED TYPE:181,182,288
TYPE VMC 126/SIEMENS802Del





ALTERATION										TITLE: PANNEL DIAGRAM	203-36-006
										REPEATED TYPE:181,182,200	TYPE: VMC 1250 EMEN

VMC-125 ALARM LIST

7000000 "GEAR BOX COOLER ALARM I3.4=?

7000001 "802D AMBIENT TEMPRATURE ALARM!

7000002 "AIR PRESSURE LOW I1.7=1 ?

7000003 "TOOL CHANGE LONG TIME

7000004 "SPINDLE UN/CLAMP ALARM I3.0=1 ? I3.1=0 !

7000005 "HI/LOW GEAR ALARM I2.6 OR I2.7 = ?

7000006 "PSM fault :check SIMODRIVE 611 module I1.0=1 ?

7000007 "COUNTER SENSOR ALARM I2.2=?(USE M91 FOR MAG.REF.)

7000008 "MAGAZINE FOR/BACK ALARM I2.0=? I2.1=?

7000009 "MAGAZINE UP/DOWN ALARM I2.3=? I2.4=?

7000010 "TOOL NO. ALARM T<0 T>25?

7000011 "MAGAZINE RUNS LONG TIME

7000012 "LEFT SAFTY DOOR OPEN!

7000013 "RIGHT SAFTY DOOR OPEN!

7000014 "CENTRAL LUB.PRESURE IS LOW I3.3=0?

7000015 "TOOL POT ALARM

7000016 "MAGAZINE ROTATION MOTOR OVERLOAD!

7000017 "GEARBOX COOLING MOTOR OVERLOAD!

7000018 "SPINDLE FAN MOTOR OVERLOAD!

7000021 "CHEAP CLEANER MOTOR OVERLOD!

7000022 "DRIVE POWER UP ALARM (T-52)!

7000023 "MCP DEFECTIVE!

7000024 "

7000025 "AUTO. COOLANT KEY NOT PUSHED!

7000026 "POWER NOT READY.PUSH POWER ON KEY.

7000027 "HANDHELD UNIT ON.

7000028 "CENTRAL LUB.TUNK LEVEL IS LOW

7000029 "DOOR OPEN

7000030 "DOOR NOT LOCKS

7000031 "DOORLOCK BYPASS

VMC 126/1050/850 center machine

M Functions

M	Functions
M00	Program stop.
M01	Program optional stop.
M02	Program End.
M03	Spindle CW
M04	Spindle CCW
M05	Spindle STOP
M07	Air blast ON.
M08	Coolant ON.
M09	Coolant OFF.
M12	Air blast OFF.
M17	End of subroutine
M19	Spindle Orientation
M24	Chip conveyor ON.
M25	Chip conveyor OFF.
M30	As M02.If M30 key is pushed,Auto power off is active after M30
M37	Chip clean ON
M38	Chip clean OFF
Automatic Gear change	
M40	Auto. gear chang according S command(M41,42 CANCELED)
M41	Gear stage 1 engaged (S=5 – 2000)
M42	Gear stage 2 engaged (S=2000 –8000)

Setup switches

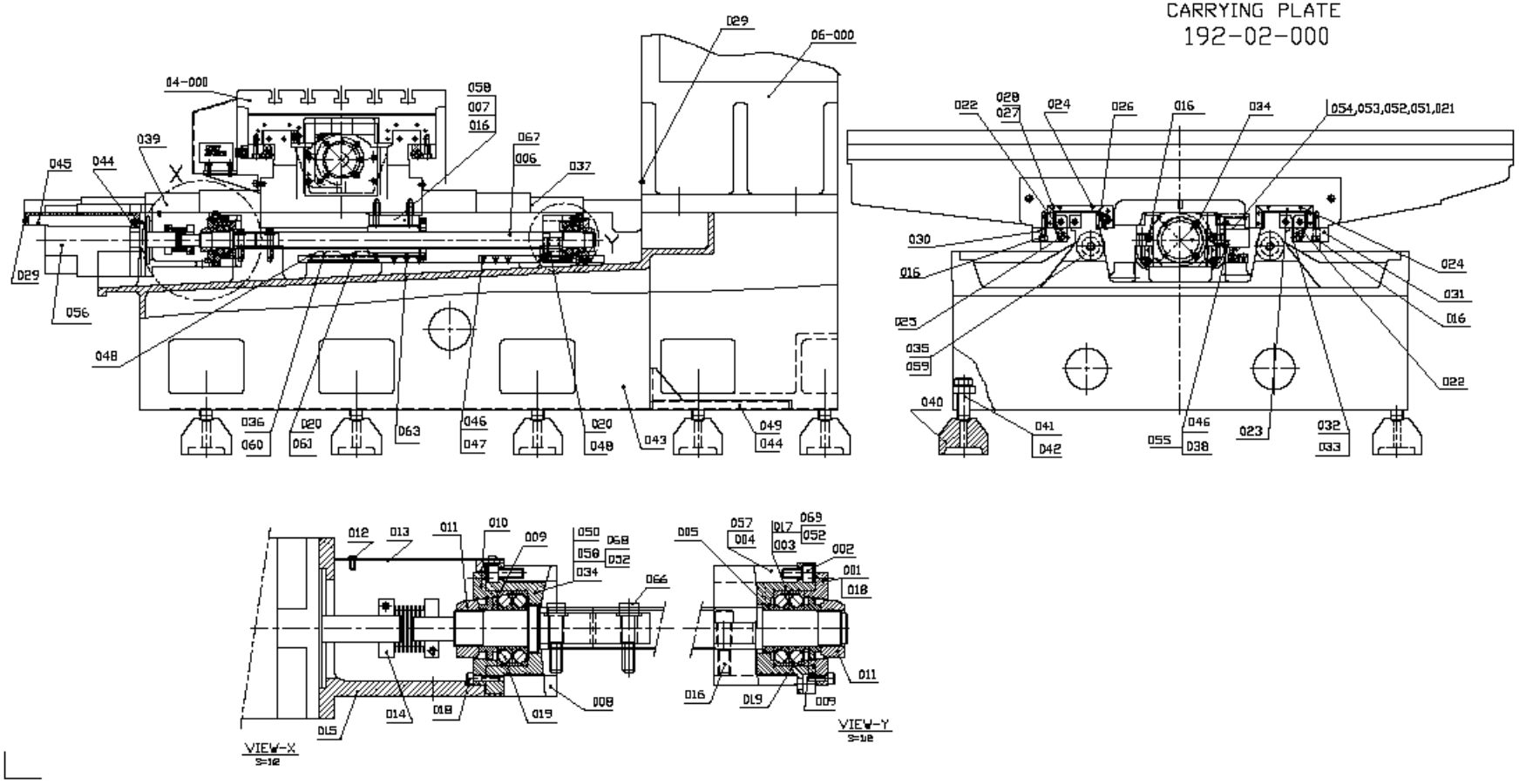
M54	Setup switch is OFF
M55	Setup switch is ON
A.T.C	**Automatic Tool changer**
M75*	A.T.C Z axis position.
M77*	Spindle Tool clean ON.
M78*	Spindle Tool clean OFF.
M80*	Searching programed tool.
M81*	Magazine Forward.
M82*	Magazine Backward.
M83*	Magazine Down.
M84*	Magazine up.
M87*	Spindle Tool unclamp.
M88*	Spindle Tool clamp.
M91	Magazine reference.
M94	Central Lubrication ON
Miscellaneous	
LL75	Axis Automatic Tool change positioning cycle.
Tn	Automatic Tool change (n=1,..,24)

* Use setup switch (M55) for activing of these stored M codes.

ALTERATION	
DATE	
SIGNATURE	
DRAWN	
CHECKED	
STANDARD	
APPROVED	
DATE	
SIGNATURE	
TITLE	
REPEATED TYPE:181,182,288	
203-36-006	
TYPE	VMC 126/8 EMENB002Del
Pg. 36	
No. 38	

VI. PART LIST

CARRYING PLATE
192-02-000

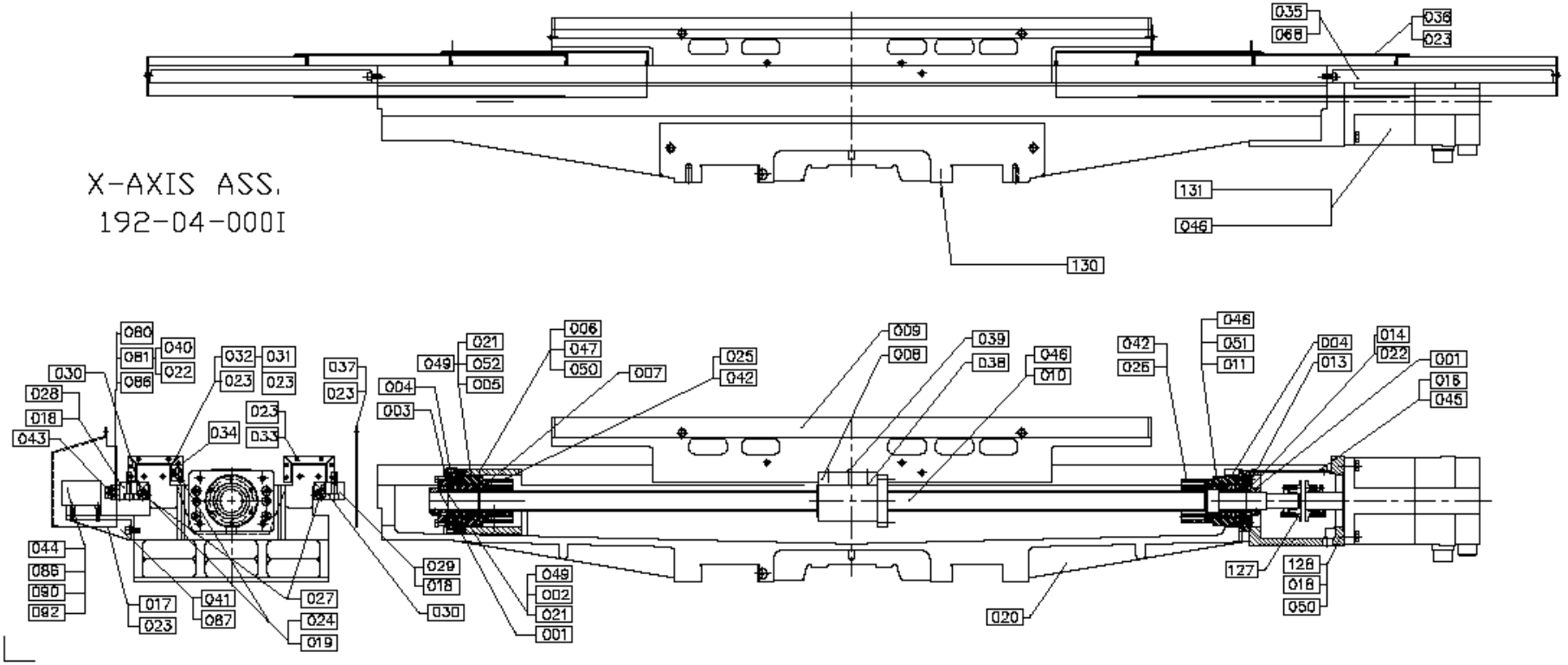


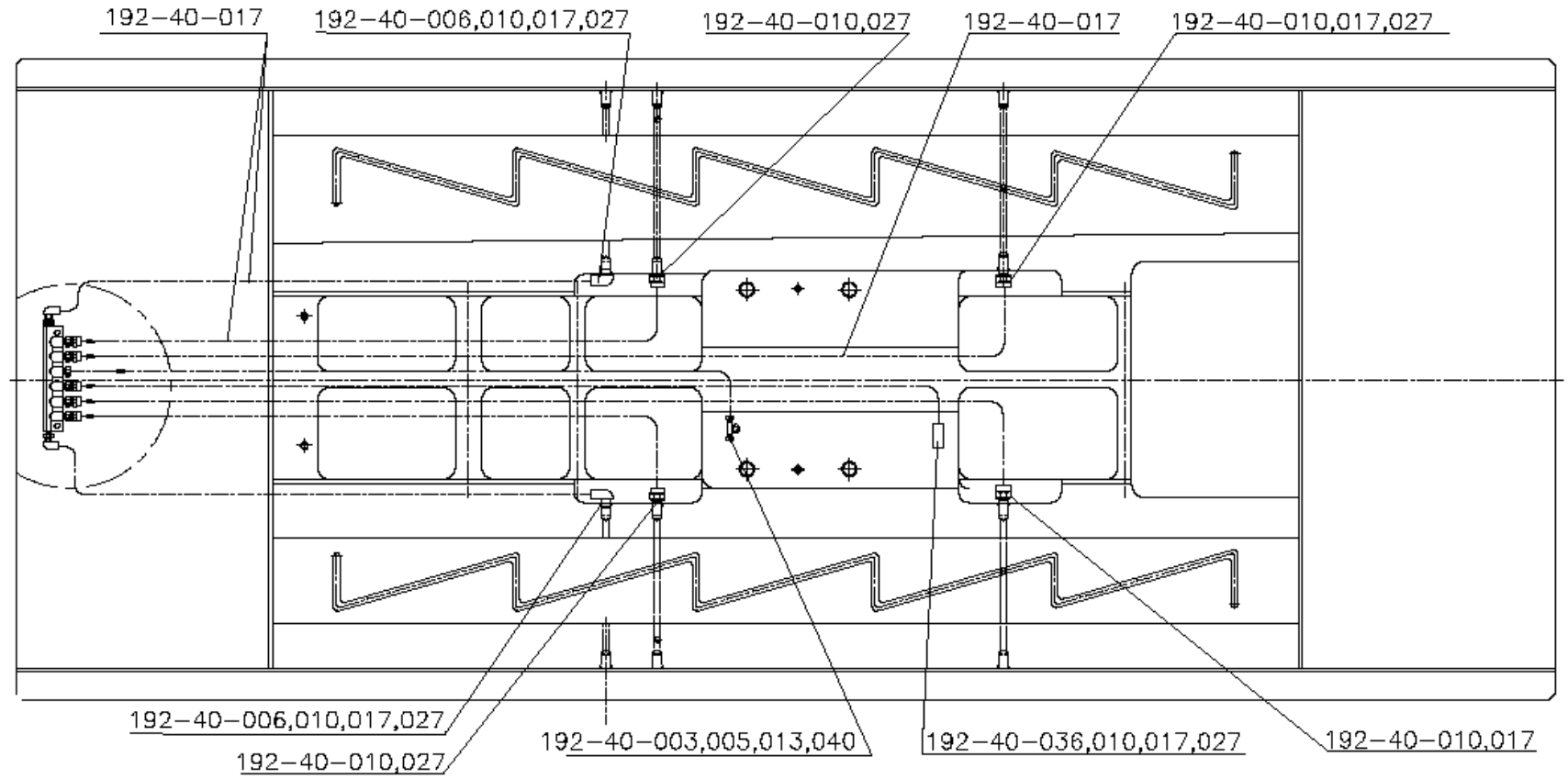
192-02-000/ PART LIST:Y-AXIS

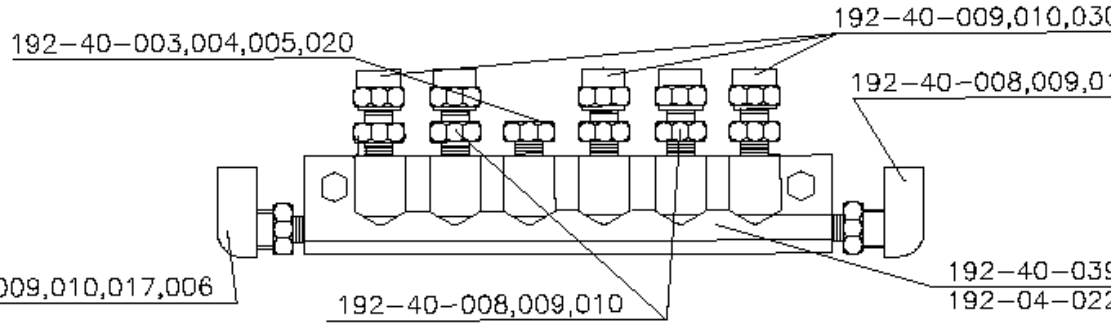
NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	1
1	000	192-02-000	Y-AXIS ASS.	4
2	001	192-02-001	BEARING CAP	1
3	002		SCREW M8x30-12.9	1
4	003	192-02-003	BEARING SEAT	1
5	004	192-02-004	BEARING SUPPORT SEAT	1
6	005	192-02-005	COLLAR	1
7	006	192-02-006	BALL SCREWS AND NUT	1
8	007	192-02-007	NUT BRACKET	2
9	008	192-02-008	BEARING SUPPORT SEAT	1
10	009	202-02-013	COLLAR	2
11	010	192-02-010	BEARING CAP	4
12	011		LOCKING NUT YSF M35x1.5	1
13	012		CAP SCREW M5x8-10.9	1
14	013	192-02-013	COVER PLATE	1
15	014		COUPLING BKL60/28/32	20
16	015	192-02-015	MOTOR BRACKET	2
17	016		SCREW M12x45-12.9	12
18	017		TAPER PIN A6x40-St	4
19	018		SCREW M6x20-12.9	2
20	019		BALL BEARING BSB 035072T. L55	1
21	020	202-06-035	LIMIT TOUCH BLOCK	2
22	021	266-02-021	FIXING BRACKET	2
23	022	192-02-022	TAPER GIB	22
24	023	192-02-023	WIPER	6
25	024		CAP SCREW M5x12	1
26	025	202-02-043	ADJUSTING SCREW	1
27	026	192-02-026	TAPER GIB	1
28	027	192-02-027	WIPER	16
29	028	192-02-028	WIPER	1
30	029		CAP SCREW M5x10-10.9	1
31	030	192-02-030	CARRYING PLATE	6
32	031	192-02-031	CARRYING PLATE	12
33	032	202-02-044	SHIM	8
34	033		SCREW M4x8-8.8	2

35	034		SCREW M10x25-12.9	1
36	035	266-02-032	EYE BOLT	1
37	036	202-02-024	ORIGINAL POINT TOUCH BLOCK	1
38	037	192-02-037	TELESCOPE COVER	1
39	038		LIMT SWITCH RGBF 02 D12-502	10
40	039	192-02-039	TELESCOPE COVER	10
41	040	202-02-020	MACHINE LEG SEAT	10
42	041	202-02-028	ANCHOR BOLT	1
43	042		NUT M30x2	4
44	043	192-02-043	BASE	2
45	044		SCREW M8x20-12.9	10
46	045	192-02-045	TELESCOPE COVER BRACKET	1
47	046		SCREW M6x25-12.9	6
48	047	266-02-047	TOUCH BLOCK ADJUSTING PLATE	1
49	048		SCREW M5x14-12.9	1
50	049	192-02-049	PUMP SEAT	1
51	050	192-02-050	BEARING SEAT	8
52	051		TAPER PIN A6x16-St	2
53	052		SCREW M5x25-12.9	2
54	053		WASHER A5.3	2
55	054		WASHER A5-FST	1
56	055		WASHER B6-FST	2
57	056		MOTOR 1FK7083-5AF71-1DGO	4
58	057		TAPPER PIN 8x45	2
59	058		TAPPER PIN 6x45	1
60	059		SCREW M20X80-12.9	2
61	060	202-02-054	PLATE	
62	061	202-06-063	LIMIT TOUCH BLOCK	1
63	063	266-02-063	TOUCH BLOCK ADJUSTING PLATE	1
64	064		TUCITE B 28x1.2x488	4
65	065		TUCITE B 36x1.2x488	4
66	066		SCREW M12x50-12.9	1
67	067		SCREW M10x30-12.9	1
68	068	266-02-031	TOUCH BLOCK	
69	069	266-02-035	TOUCH BLOCK	

X-AXIS ASS.
192-04-0001



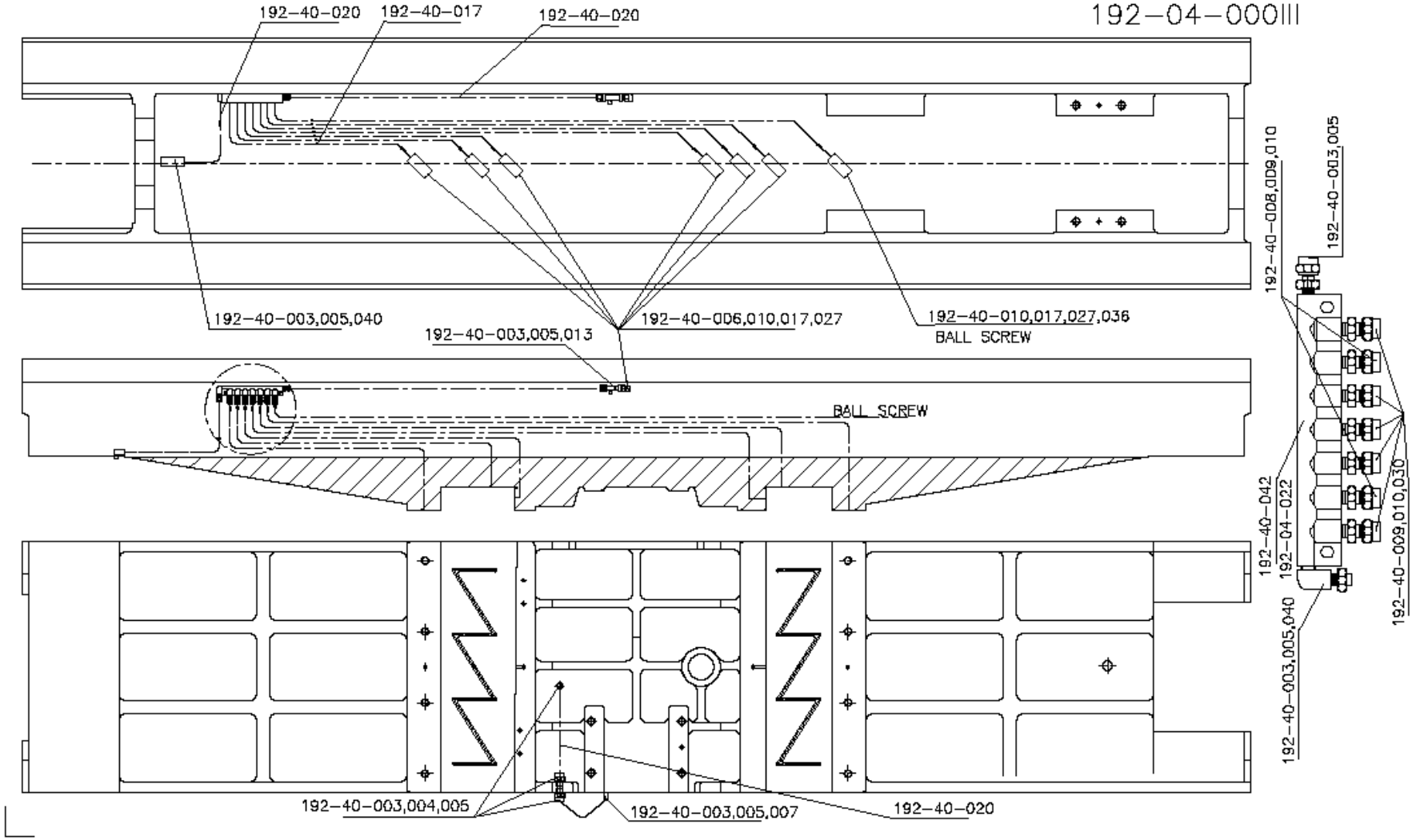




X AXIS LUBRICATION

192-04-00011

Y AXIS LUBRICATION
192-04-000III

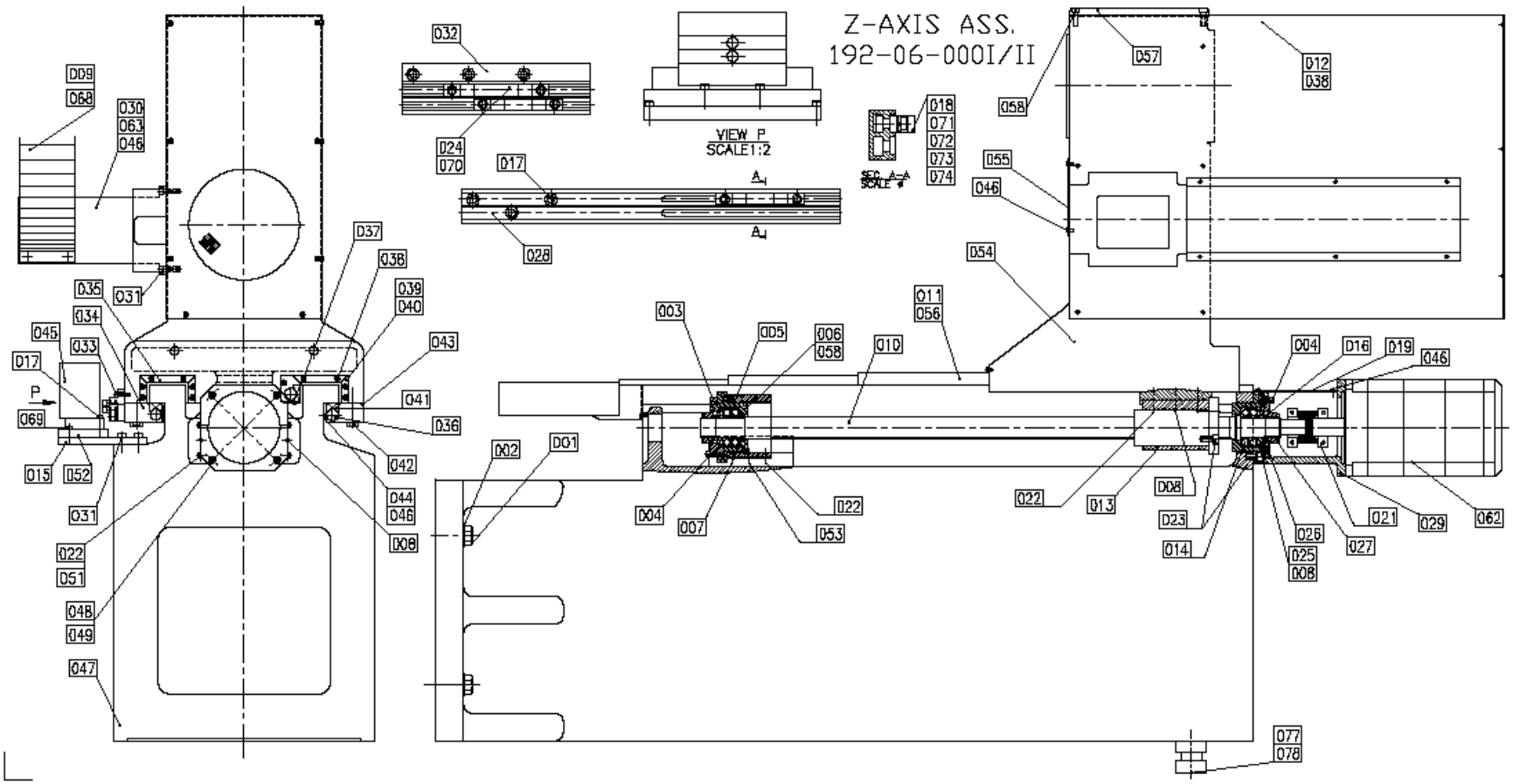


192-04-000/PART LIST/X-AXIS.

NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	001		LOCKING NUT YSF M35X1.5	2
2	002	202-02-002	SHAFT COVER	1
3	003	202-02-003	COLLAR	1
4	004		ANGULAR CONTACT BALL BEARING BSB 035072T. L55	6
5	005	202-02-005	BEARING SEAT	1
6	006	202-02-006	BEARING SUPPORT SEAT	1
7	007	202-02-007	COLLAR	1
8	008	192-02-007	NUT BRACKET	1
9	009	192-04-009	TABLE	1
10	010	203-04-151	BALL SCREWS AND NUT	1
11	011	192-04-011	BEARING SEAT	1
12	013	202-02-013	COLLAR	1
13	014	202-02-014	BERING CAP	1
14	016	202-02-016	MOTOR BRACKET COVER	1
15	017	192-04-017	FRONT COVER	1
16	018		SCREW M10X40_ 12.9	18
17	019		SCREW M4X8 -10.9	12
18	020	192-04-020	SADDLE	1
19	021		SCREW M8X35- 12.9	12
20	022		SCREW M6X25 -12.9	12
21	023		SCREW M5X10 -10.9	52
22	024	202-02-044	SHIM	6
23	025	202-02-048	TOUCH BLOCK	1
24	026	202-02-049	TOUCH BLOCK	1
25	027	202-02-043	ADJUSTING SCREW	6
26	028	192-04-028	LEFT RETAINER PLATE	1
27	029	192-04-029	RIGHT RETAINER PLATE	1
28	030	192-04-030	TAPER GIB	2
29	031	192-04-031	WIPER	1
30	032	192-04-032	WIPER	1
31	033	192-04-033	WIPER	2
32	034	192-04-034	TAPER GIB	1

33	035	192-04-035	TELESCOPE COVER BRACKET	4
34	036	192-04-036	TELESCOPE COVER	2
35	037	192-04-037	PROTECTION COVER	1
36	038		SCREV M12 X40-12.9	4
37	039		TAPER PIN A6X40-St	2
38	040	202-04-040	TOUCH BLOCK ADJ PLATE	2
39	041	192-04-041	LIMIT SWITCH SEAT	1
40	042		SCREW M5X22 -12.9	6
41	043	202-02-024	ORIGINAL POINT TOUCH BLOCK	3
42	044		LIMITSWITCH RGBF 02 D12-502	1
43	045		SCREW M5X6	4
44	046		SCREW M10X35 -12.9	12
45	047		SCREW M14X60-12.9	4
46	049		SPRING WASHER 8-fst	12
47	050		PIN A10X50-St	4
48	051		PIN A6X36-St	2
49	052		PIN A8X40-St	2
50	056		TURCITE B 102X1.2X388	1
51	057		TURCITE B 117X1.2X388	1
52	058		TURCITE B 35X1.2X388	1
53	059		TURCITE B 67X1.2X800	1
54	060		TURCITE B 76X1.2X800	1
55	061		TURCITE B 30X1.2X800	1
56	062		TURCITE B 22X1.2X900	2
57	063		TURCITE B 30X1.2X900	1
58	064	192-04-064	COVER	1
59	065		SCREW M6x10	2
60	068		SCREW M8X25-12.9	8
61	080	202-02-054	PLATE	3
62	081		SCREW M5X14-12.9	6
63	086		WASHER B5.3-St	10
64	087		SCREW M8X22 - 12.9	2
65	090		SCREW M5X30 - 12.9	4
66	092		NUT M5-6-St	4
67	127		COUPLING BKL 60/28/32	1

68	128	192-04-128	MOTOR BASE SEAT	1
69	130		PATH LOCKING HK 050 CK11-111	2
70	131		MOTOR 1FK7083-5AF71-1DGO	1


Z-AXIS ASS.
192-06-0001/II
VIEW P
SCALE1:2
SEC A-A
SCALE 2
D09
D68
D30
D63
D46
D32
D24
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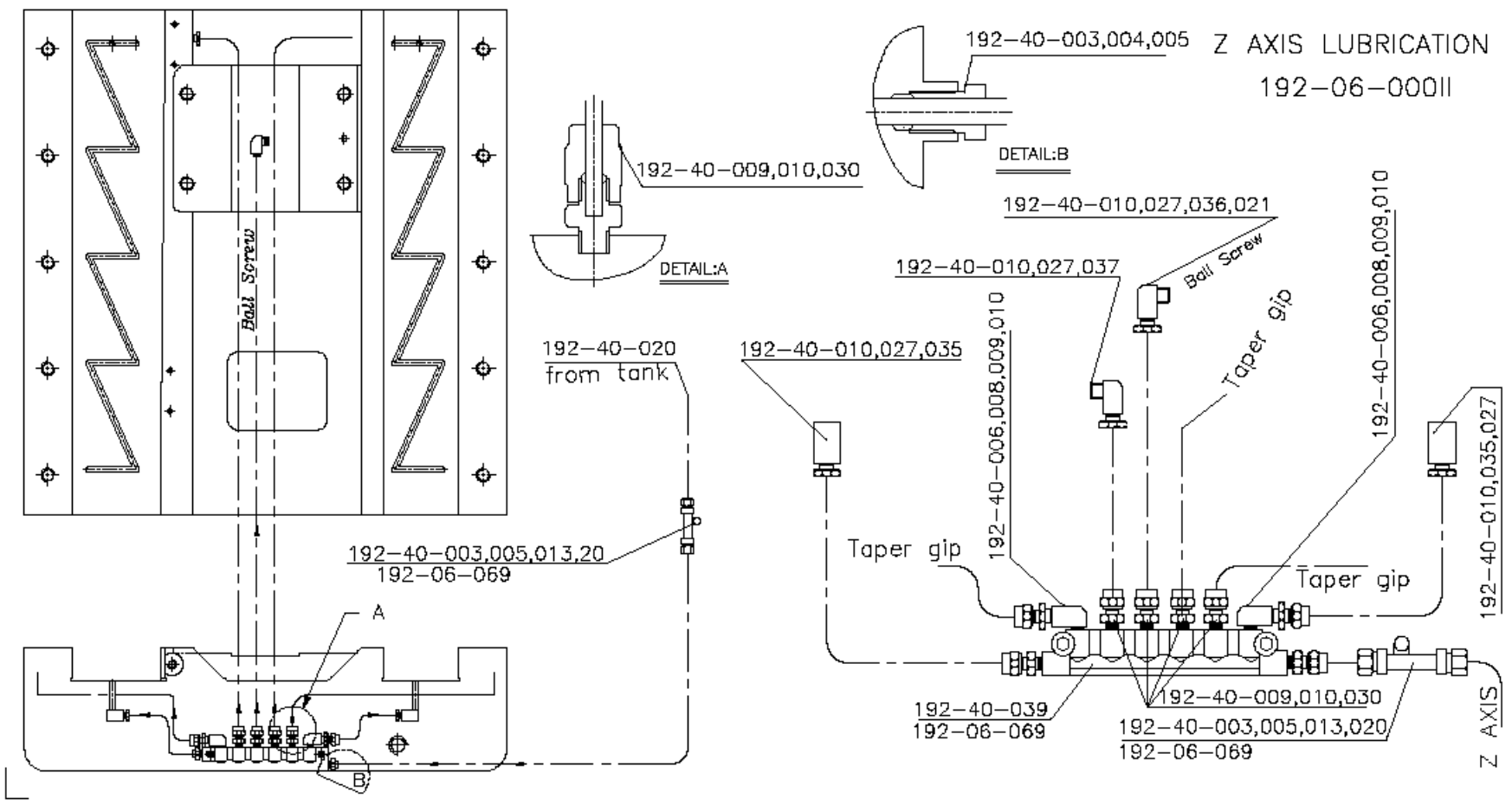

Z AXIS LUBRICATION
192-06-00011
192-40-003,004,005
DETAIL:B
192-40-009,010,030
DETAIL:A
192-40-010,027,036,021
192-40-010,027,037
Ball Screw
Taper gip
192-40-006,008,009,010
192-40-010,027,035
192-40-020
from tank
192-40-003,005,013,20
192-06-069
Ball Screw
A
B
Taper gip
Taper gip
192-40-010,035,027
192-40-039
192-06-069
192-40-009,010,030
192-40-003,005,013,020
192-06-069
Z AXIS

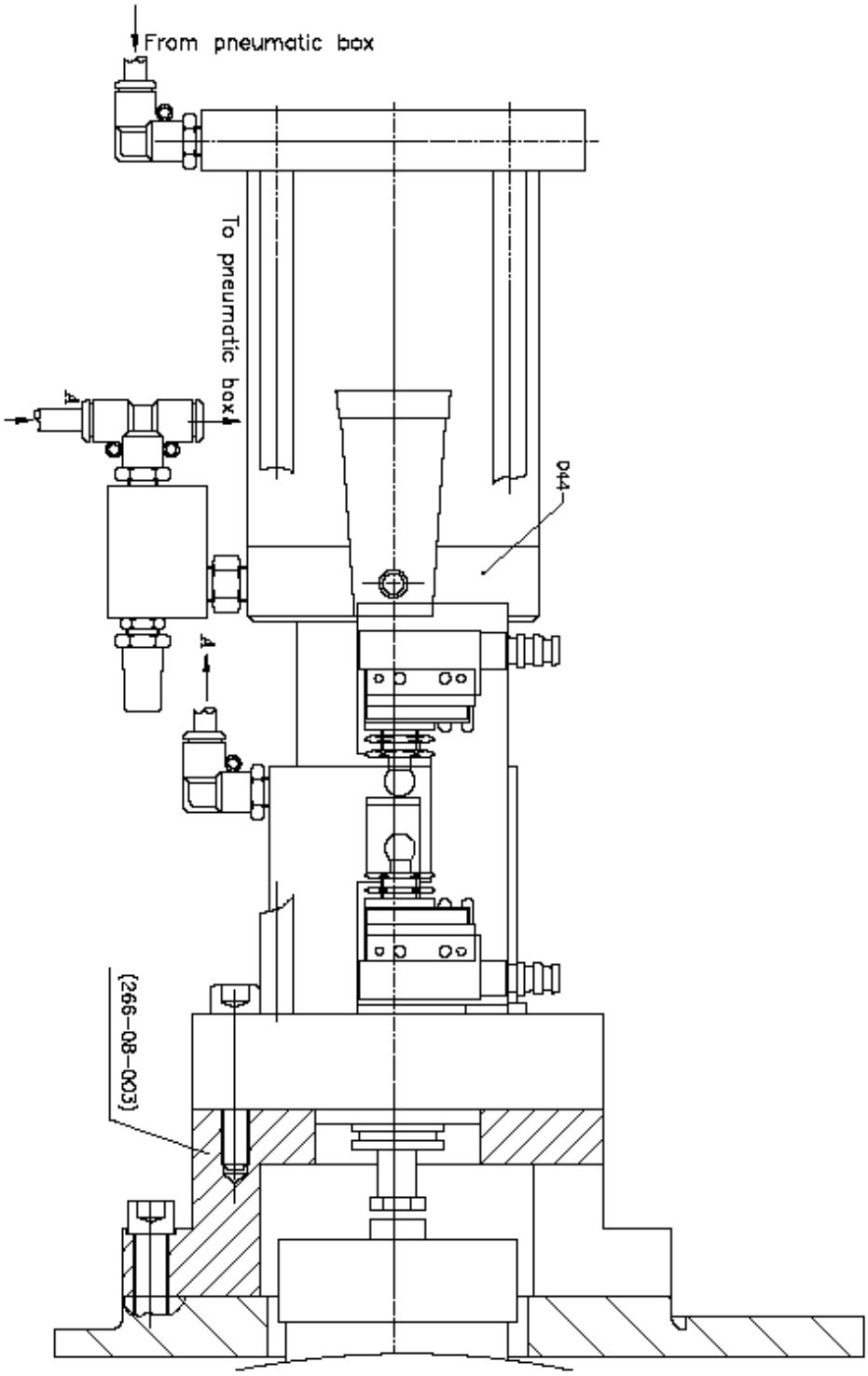
192-06-000 PART LIST:Z-AXIS ASS.

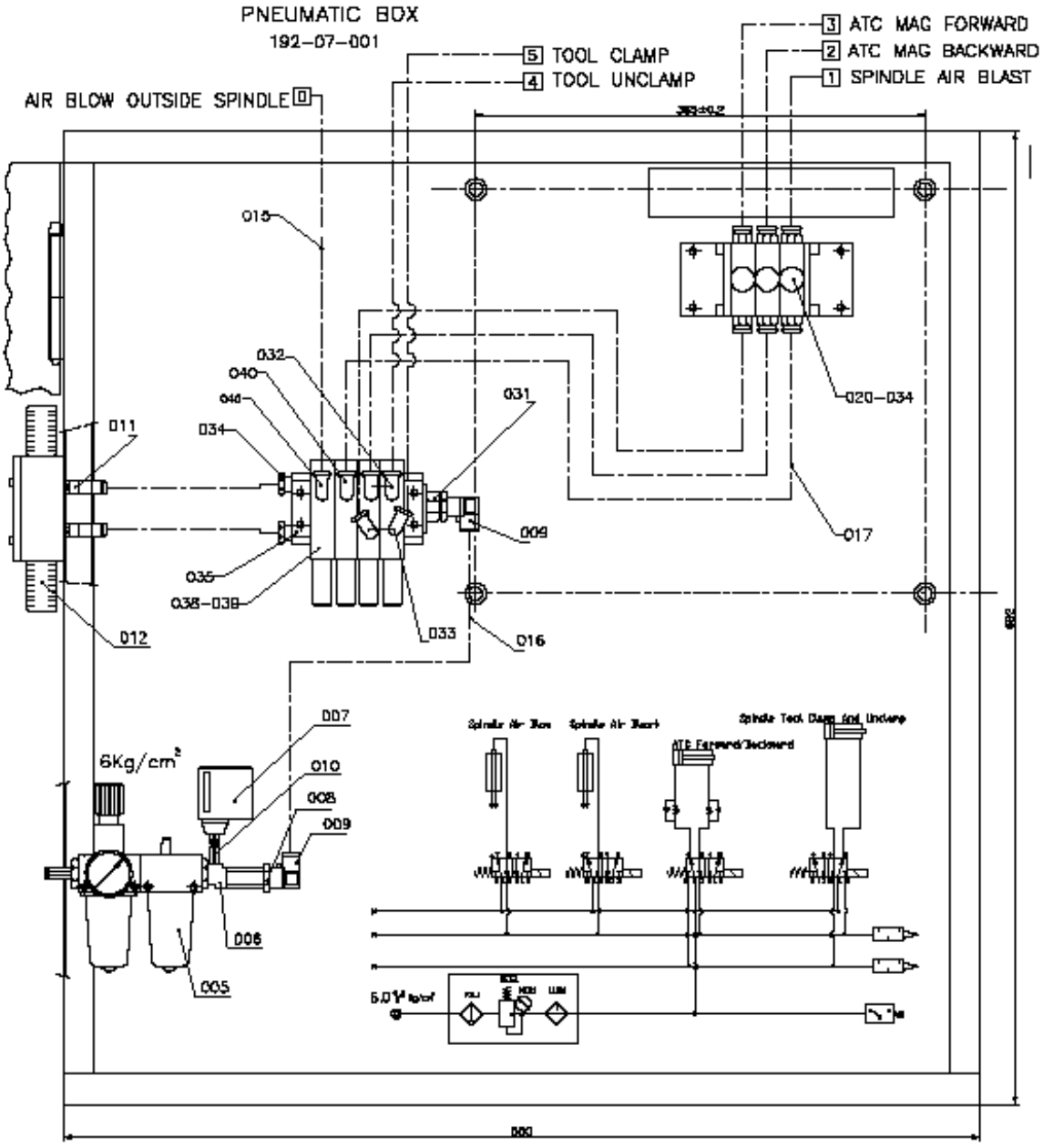
NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	001		SCREW M20x90-8.8	8
2	002		WASHER 20-FST	8
3	003	192-02-001	BEARING CAP	1
4	004		SCREW M6x20-12.9	12
5	005	192-02-004	BEARING SUPPORT SEAT	1
6	006	192-02-003	BEARING SEAT	1
7	007	192-02-005	COLLAR	1
8	008		TAPER PIN A6x45	8
9	009		CABLE CARIER SQ303TYPE IV,FLANGE 7(AxA) L=1650mm	1
10	010	192-06-010	Z-AXIS BALL SCREW	1
11	011	192-06-011	TELESCOPE COVER	1
12	012	192-06-012	FRONT COVER	1
13	013	192-02-007	NUT BRACKET	1
14	014		ANGULAR BALL BEARING BSB 35072T.L55	4
15	015	192-06-015	SWITCH SEAT	1
16	016	202-02-013	COOLAR	2
17	017		SCREW M6x30-12.9	6
18	018	202-06-035	LIMIT TOUCH BLOCK	2
19	019	192-06-019	COVER PLATE	1
20	021		COUPLING BKL 60/28/32	1
21	022		SCREW M12x45-12.9	12
22	023		SCREW M10x25-12.9	8
23	024	202-02-024	ORIGINAL POINT TOUCH BLOCK	1
24	025	192-02-050	BEARING SEAT	1
25	026	192-02-010	BEARING CAP	1
26	027		LOCKING NUT YSF M35x1.5	2
27	028	192-06-028	TOUCH BLOCK ADJUSTING PLATE	1
28	029	192-06-029	MOTOR BRACKET	1
29	030	192-06-030	COIL PIPE FIXING BLOCK	1

30	031		SCREW M8x30-12.9	8
31	032	202-06-042	TOUCH BLOCK ADJUSTING PLATE	1
32	033		SCREW M6x16-12.9	3
33	034	192-06-034	LEFT RETAINING PLATE	1
34	035	192-04-033	WIPER	2
35	036	202-02-043	ADJUSTING SCREW	6
36	037	192-06-037	TAPER GIB	1
37	038		CAP SCREW M5x10-10.9	47
38	039	192-04-031	WIPER	1
39	040	192-04-032	WIPER	1
40	041	192-06-041	TAPER GIB	2
41	042		SCREW M12x50-8.8	10
42	043	192-06-043	RIGHT RETAINING PLATE	1
43	044	202-02-044	SHIM	6
44	045		LIMIT SWITCH RGBF02 D12-502	1
45	046		SCREW M4x8-10.9	14
46	047	192-06-047	COLUMN	1
47	048		SCREW M10x25-12.9	4
48	049		WASHER 10-FST	4
49	050		SCREW M12x45-12.9	8
50	051		WASER 12-FST	4
51	052	202-06-052	SWITCH SEAT	1
52	053		TAPER PIN A8x45-St	2
53	054	192-06-054	HEAD STOCK	1
54	055	192-06-055	COVER PLATE	1
55	056		CAP SCREW M6x10-10.9	10
56	057	192-06-057	COVER PLATE	1
57	058		SCREW M8x25-12.9	8
58	059		TURCITE B 30x1.2x550	1
59	060		TURCITE B 22x1.2x550	2
60	061		TURCITE B 67x1.2x450	2
61	062		Z-AXIS MOTOR 1FK7083-5AF71-1DHO	1
62	063	192-06-063	COVER	1
63	067		TURCITE B27x1.2x450	1
64	068		SCREW M8x10-12.9	8

65	069		SCREW M6x25-12.9	8
66	070	202-02-054	PLATE	1
67	071	202-06-063	PLATE	2
68	072		SCREW M5x14-12.9	6
69	073		WASHER B5.3-St	6
70	074		WASHER 5-FSt	6
71	075		SCREW M4X8-8.8	12
72	076		TURCITE B 82.5X1.2X450	1
73	077	202-02-165	EYE BOLT	2
74	078		SCREW M24X60-12.9	2
75				

PNEUMATIC BOX
192-07-001




PNEUMATIC BOX
192-07-001
AIR BLOW OUTSIDE SPINDLE 0
5 TOOL CLAMP
4 TOOL UNCLAMP
3 ATC MAG FORWARD
2 ATC MAG BACKWARD
1 SPINDLE AIR BLAST
015
020-034
032
040
044
034
031
011
009
017
035
038-038
033
016
012
007
010
008
009
006
005
6Kg/cm²
Spindle Air Blow
Spindle Air Blast
ATC Forward/Backward
Spindle Tool Clamp And Unclamp

PNEUMATIC BOX

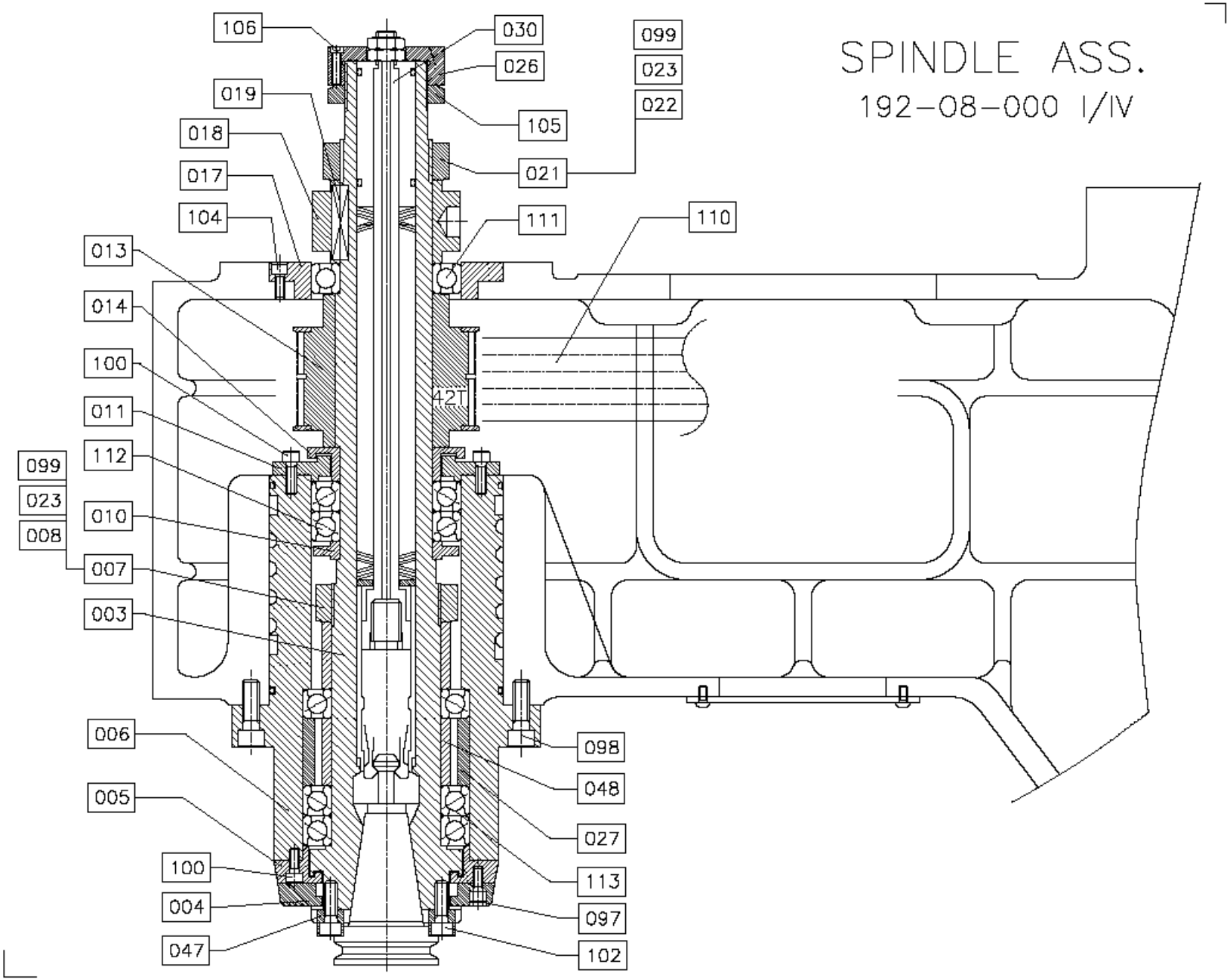
192-07-001

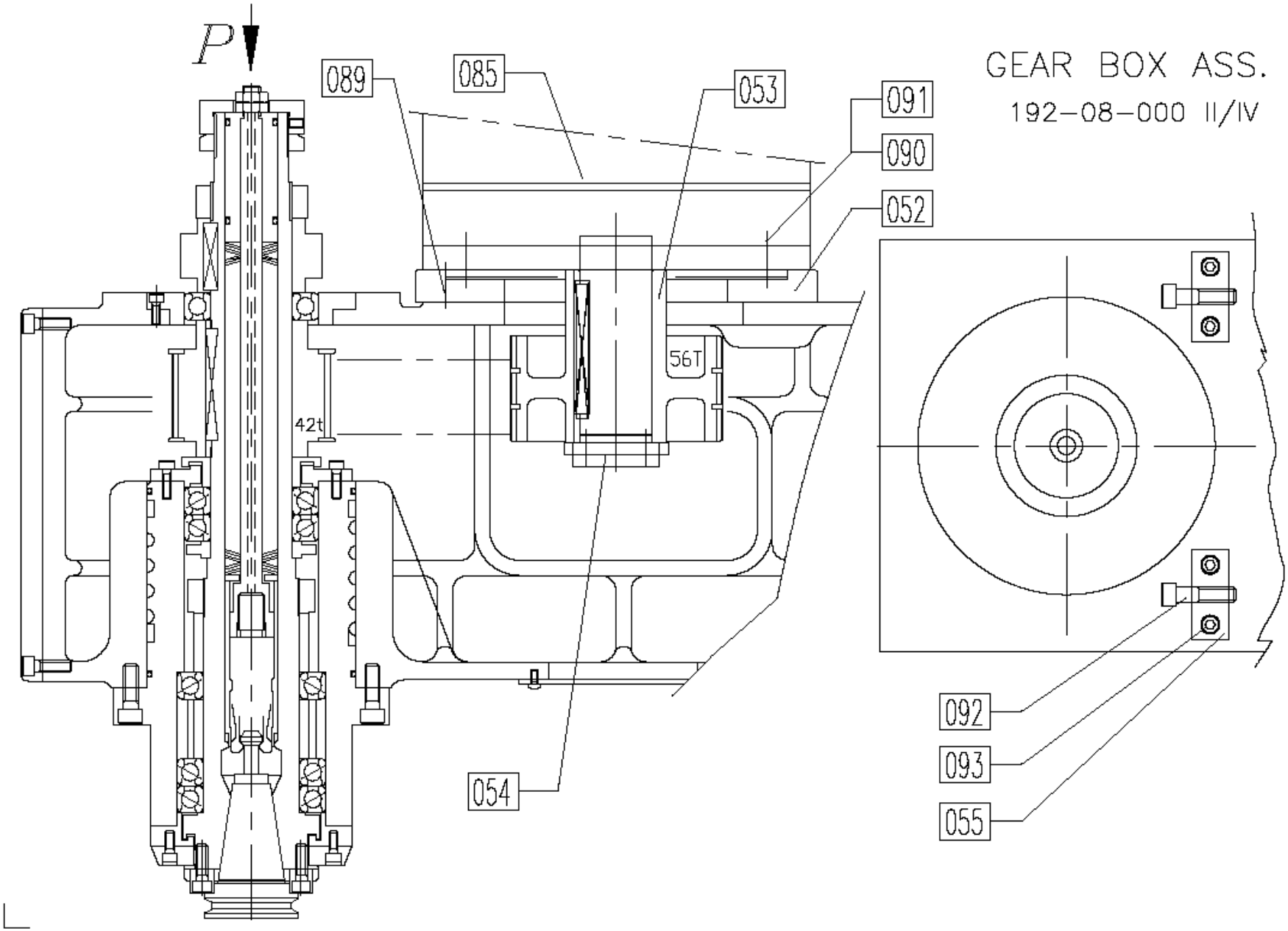
NO.OF PCS.	TITLE DIMENSIONS	POSITION
		001
		002
		003
		004
1	SERVICE UNIT FRC-1/2-S-B	005
1	TEE JOINT 2092-08	006
1	PRESSURE SWITCH KP.1 060-1101	007
1	STRAIGHT COPPER JOINT 1863 21 17	008
2	ELBOW TYPE QUICK CHANGE JOINT 1203	009
1	STRAIGHT COPPER JOINT 1863 21 13	010
2	Y PIECES 314 10 13	011
2	SILENCER U-1/2	012
		013
		014
1	PLASTIC TUBE 8x5x16500mm TYPE PU COLOR OF RED	015
1	PLASTIC TUBE 12x8x9400mm TYPE PU COLOR OF RED	016
1	PLASTIC TUBE 10x6.5x8000mm TYPE PU COLOR OF RED	017
		018
		019
3	PNEUMATIC SPEED REGULATOR FL-6002	020

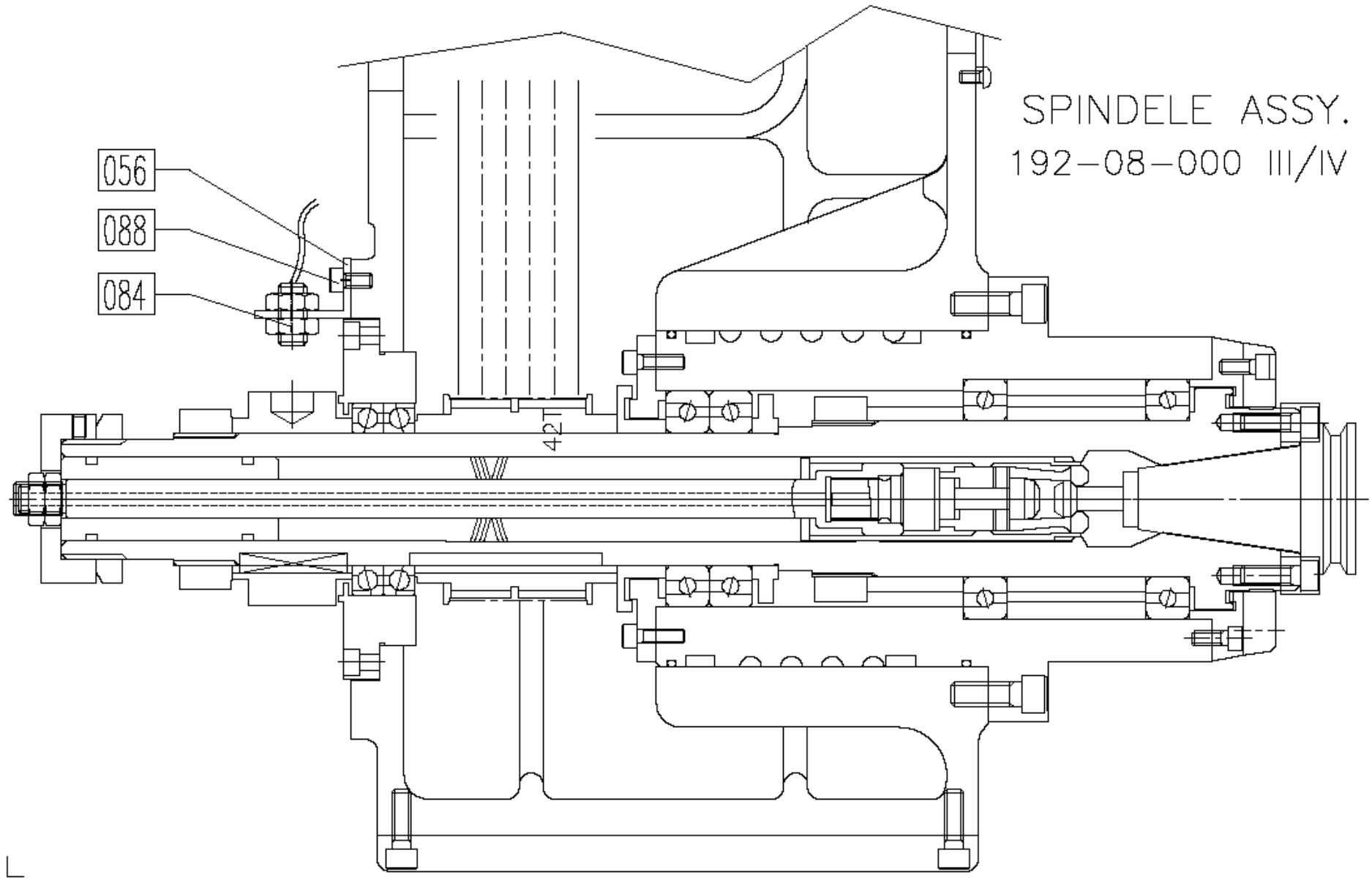
NO.OF PCS.	TITLE DIMENSIONS	POSITION
		026
		027
		028
		029
		030
1	STRAIGHT FITTING 1821 17 13	031
2	ELBOW TYPE QUICK CHANGE JOINT 1002	032
2	ELBOW TYPE QUICK CHANGE JOINT SPL10-02	033
8	QUICK CHANGE JOINT SPC 10-02	034
1	MANIFOLD BN 2608A-M5	035
		036
		037
4	PLUG PT1/4"	038
4	ELECTRO MAGNETIC VALE MVSD-260-4E1 110V	039
2	ELBOW TYPE QUICK CHANGE JOINT SPL-802	040
1	KEY FOR BOX Zx403A	041
		042
		043
1	PNEUMATIC BOOSTING CYLINDER G-4000	044

SPINDLE ASS.

192-08-000 I/IV

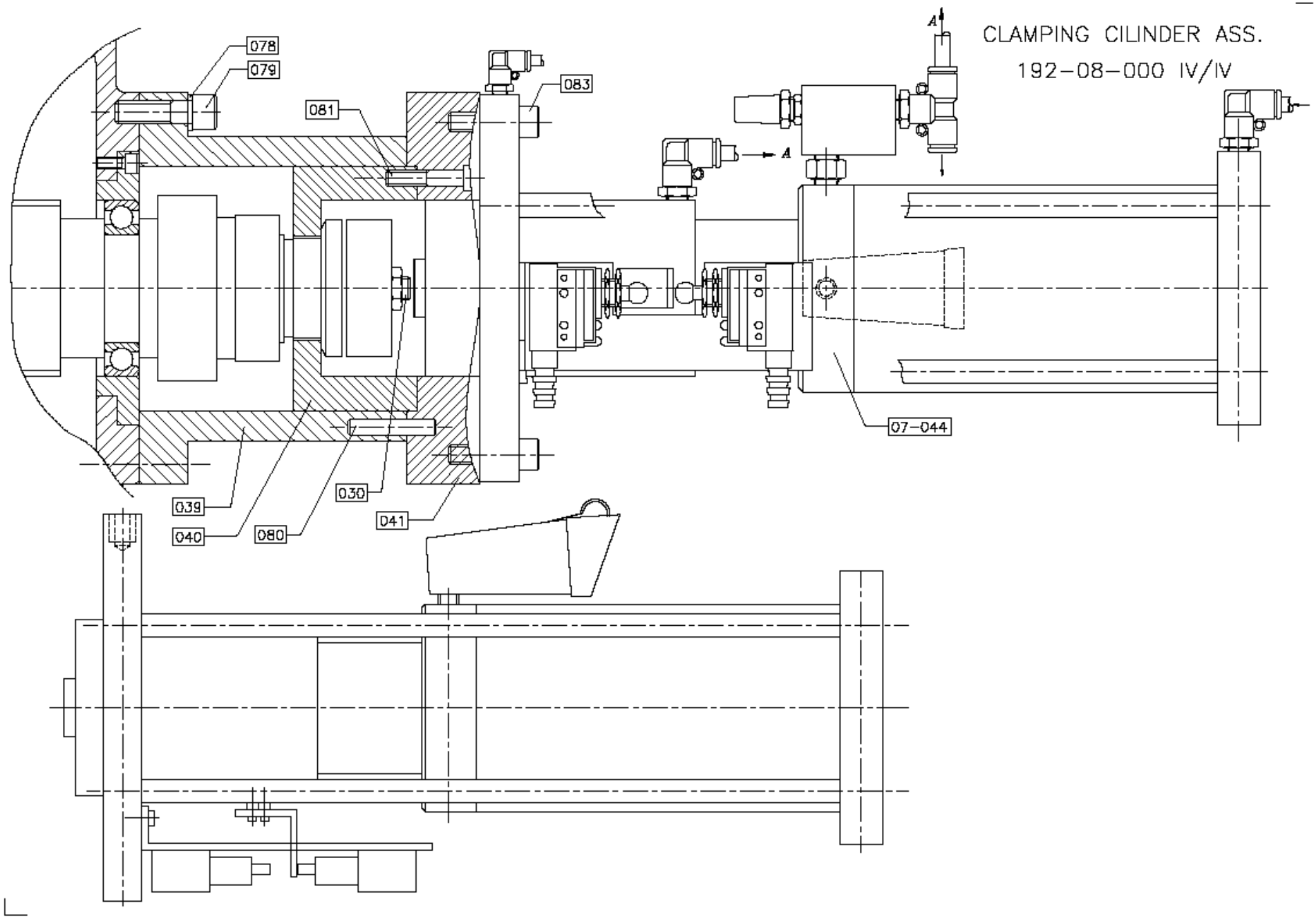



P
089
085
053
091
090
052
GEAR BOX ASS.
192-08-000 II/IV
56T
42t
092
093
055
054


SPINDELE ASSY.
192-08-000 III/IV
056
088
084
421

CLAMPING CILINDER ASS.

192-08-000 IV/IV

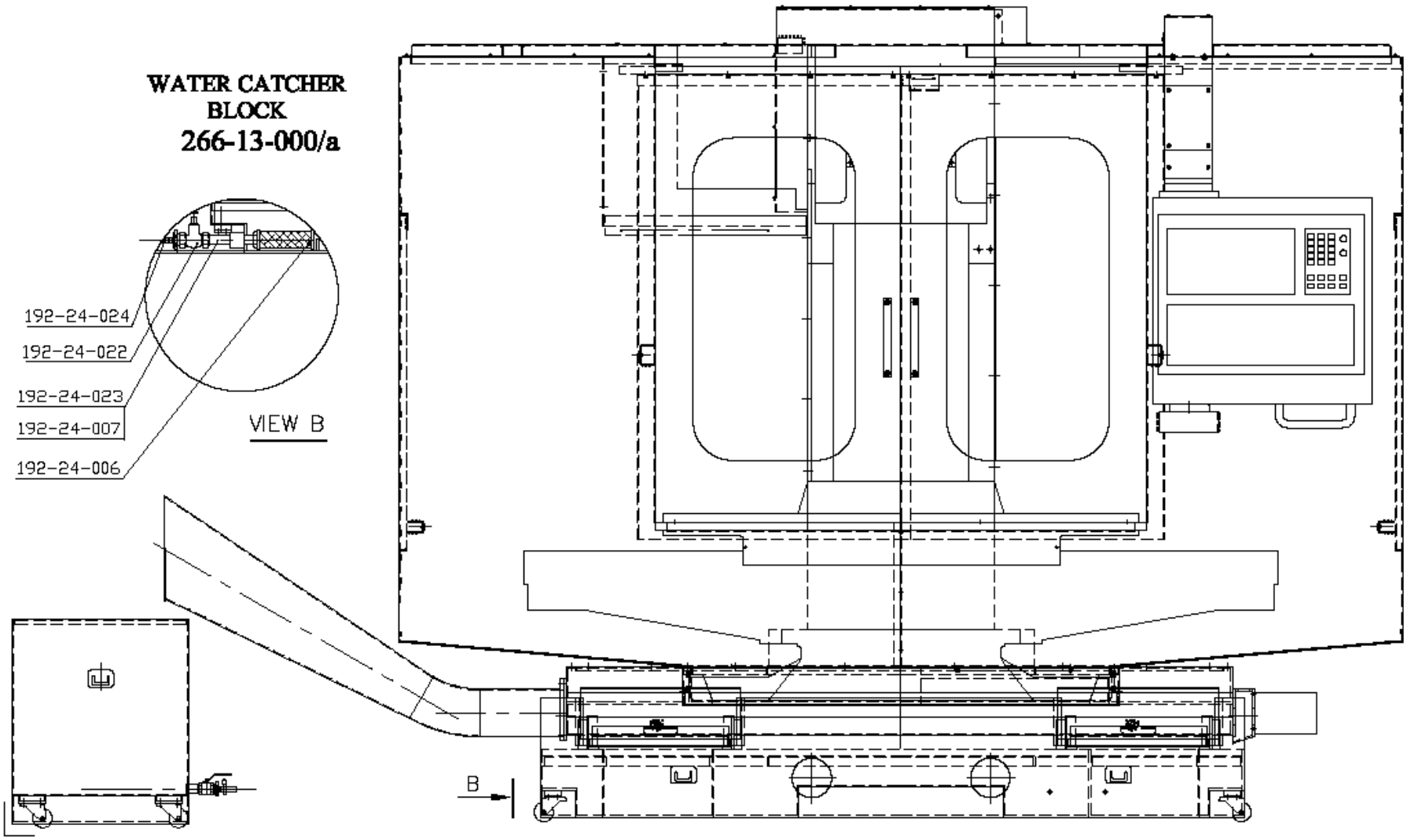


192-08-000 PART LIST: SPINDLE ASS.

NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	003	192-08-003	SPINDLE	1
2	004	192-08-004	SHAFT END	1
3	005	192-08-005	SEAL CAVER	1
4	006	192-08-006	SPINDLE SLEEVE	1
5	007		LOCKING NUT YSF M65X2	1
6	010	192-08-010	SEAL COVER	1
7	011	192-08-011	BEARING SEAT	1
8	013	192-08-013	PULLEY SUB ASS.	1
9	014	192-08-014	SEAL COVER	1
10	015	192-08-015	PULLEY	1
11	016	192-08-016	KEY 12x8x80	1
12	017	192-08-017	BEARING SEAT	1
13	018	192-08-018	LOCATING RING	1
14	019	192-08-019	KEY 12x8x45	1
15	021		LOCKING NUT YSF M55X1.5	1
16	024	192-08-024	PLATE	2
17	026	192-08-026	LOCKING NUT	1
18	027	192-08-027	OUTER COLLAR	1
19	030	192-08-030	TOOL CLAMP SUB ASS.	1
20	031	192-08-031	OUTER COLLAR	1
21	032	192-08-032	WASHER	1
22	033	192-08-033	SIEEVE	1
23	034	192-08-034	STOOL BLOCK	1
24	035	192-08-035	HOLDING DOWN BLOCK	1
25	039	192-08-039	SLAP RING SEAT	1
26	040	192-08-040	RETAINING RING	1
27	041	202-13-006	SNAP RING	1
28	047	202-08-028	KEY	2
29	048	192-08-048	COLLAR	2
30	052	192-08-052	MOTOR BASE PLATE	1
31	053	192-08-053	PULLEY	1
32	054	192-08-054	CLAMPING PIN	1

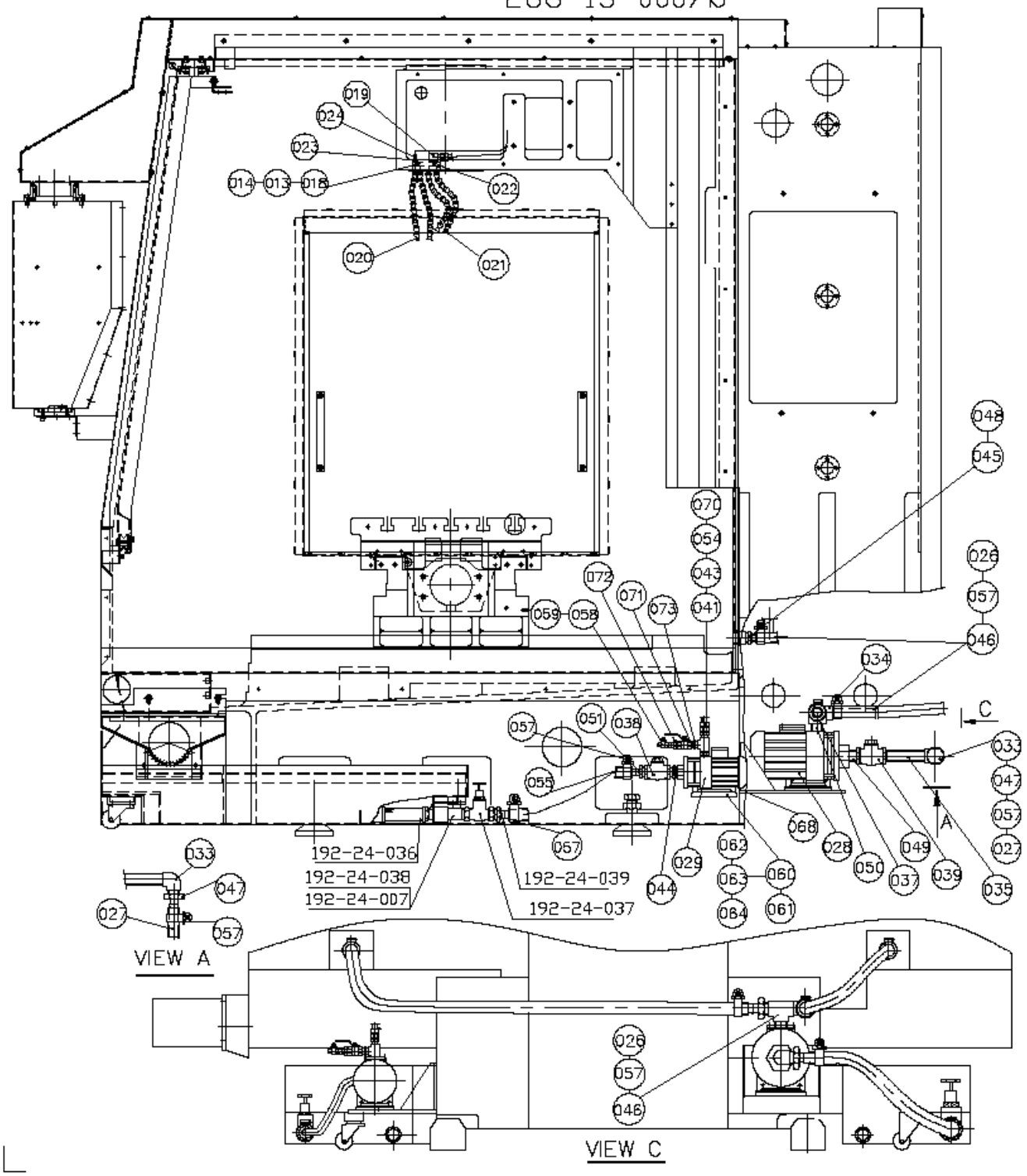
33	055	192-08-055	ADJUSTING BLOCK	2
34	056	192-08-056	FIXING SEAT	1
35	058		SCREW M4x8	8
36	060	202-13-017	COLLET CHUCK ASS.	1
37	061		DISC SPRING 34x16.3x2	102
38	062		O-RING P 29x3.5	2
39	064	202-13-096	SHAFT	1
40	065	202-13-097	JAW HOLDER	1
41	066	202-13-098	BUSH	1
42	067		PIN 3m6X12-ST	4
43	068	202-13-100	JAW	1
44	078		WASHER 12-FST	4
45	079		SCREW M12x40-St	4
46	080		PIN 8m6x40-St	2
47	081		SCREW M 8x40	7
48	083		SCREW M10x45	4
49	084		INDUCTIVE PROXIMITY SWITCH IKCT12 14	1
50	085		SPINDLE MOTOR 1PH 7107-2QF02-0CA0	1
51	088		SCREW M6x10	2
52	089		SCREW M12x35	5
53	090		SCREW M12x35	4
54	091		WASHER 12-FSt	4
55	092		SCREW M10x40	2
56	093		SCREW M8x30	4
57	096		NUT M14x1.5	2
58	097		SCREW M6x16	6
59	098		SCREW M10x30	6
60	100		SCREW M6x20	12
61	102		SCREW M8x25	2
62	104		SCREW M10x16	4
63	105		NUT M50xP1.5	1
64	106		SCREW M5x20	4
65	110		TIMING BELT 8MR-880-50	1
66	111		BALLBEARING 6011ZZ	1
67	112		SPINDLE BEARING B7011C.T.P4S.DB.L	2
68	113		SPINDLE BEARING B7013C.T.P4S.TBT.L	3

WATER CATCHER
BLOCK
266-13-000/a



WATER CATCHER BLOCK

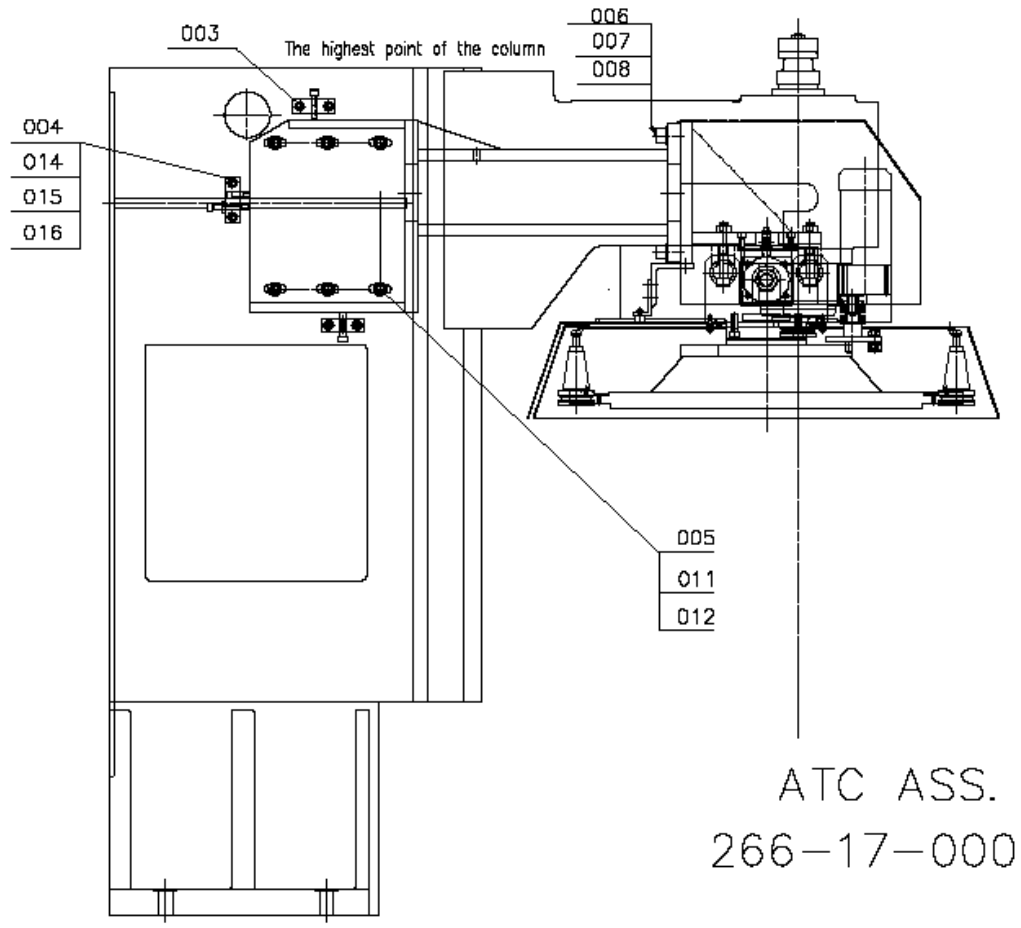
266-13-000/b



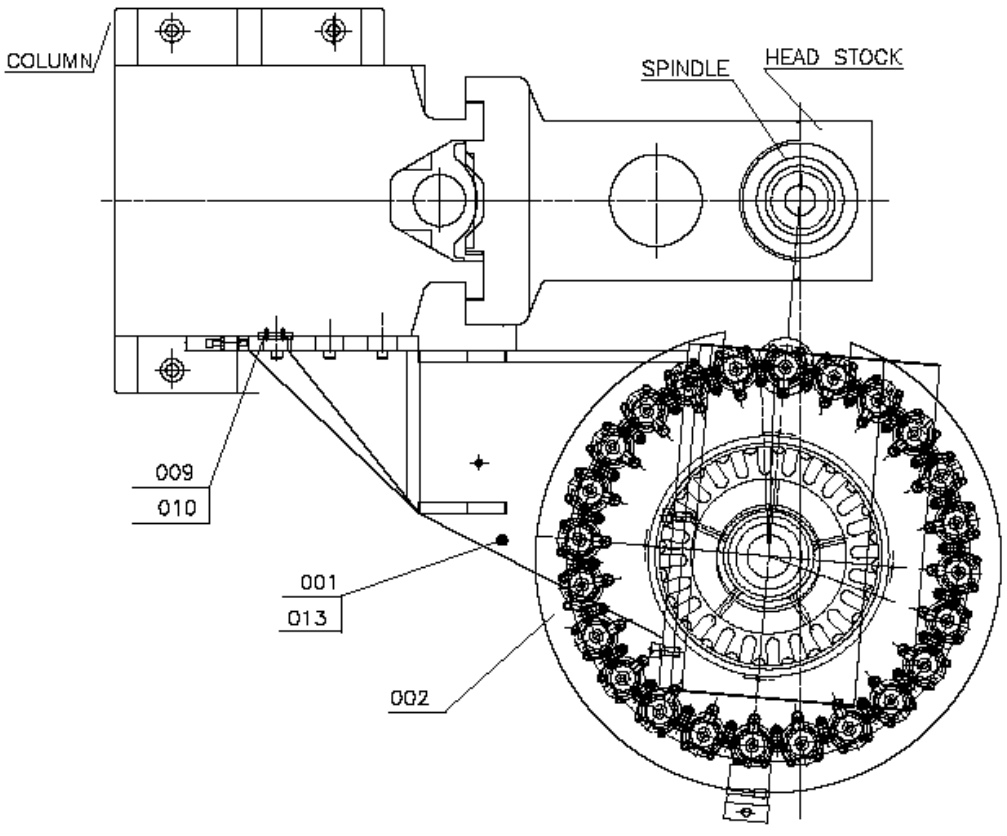
266-13-000 PART LIST : COOLANT ASS.

NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	013		SCREW M6X40-12.9	2
2	014		WASHER A6.4-St	2
3	018	202-13-042	BLOCK	1
4	019		90 MALE ELBOW 1033 (12-08)	1
5	020		ADJ. COOLANT HOSE PT3/8x285x1/8"	1
6	021		ADJ. COOLANT HOSE PT3/8x289x1/8"	3
7	022		PU PLUG PT1/4"	1
8	023		QUICK COUPLING SPC 10-02	1
9	024		NYLON TUBE 10x6.5x4500 - TYPE PU-RED	1
10	026		MESH PLASTIC SPRING HOSE 1,1/4"-3000mm	1
11	027		MESH PLASTIC SPRING HOSE 1,1/2"-2500mm	1
12	028		TROTTED PUMP CM10-3-A-R-A-AQQV	1
13	029		COOLANT PUMP CH2-30 A-A -CVBV/3X380	1
14	033		ELBOW 1 1/2"-A1	2
15	034		ELBOW 1 1/4"-A1	2
16	035		STRIGHT HOSE JO. 1,1/2"-120 TYPE 2084	1
17	037		T JOINT 1,1/4" -B1	1
18	038		CHECK VALVE 1"	1
19	039		CHECK VALVE 1,1/2"-M	1
20	041		MALE CONNECTOR 1013 (12)	1
21	043		NIPPLE 2083 (16-12)	1
22	044		NIPPLE 2083 (16) (T1=1",T2=1")	1
23	045		Reducing Nipple 1,1/4"-1" N8	2
24	046		STRIGHT HOSE JOINT 1,1/4PTx1 1/4PH N.46	4
25	047		STRIGHT HOSE JOINT 1,1/2PTx1 1/2PH N.46	2
26	048		SOCKET 1,1/4" M2	2
27	049		STRIGHT HOSE JOINT 1,1/2"-60 TYPE 2084	1

28	050		REDUCING NIPPLE 1,1/2"x1,1/4"-N8	1
29	051		STRIGHT HOSE JOINT 1"PTx1 1/2PH N.46	1
30	054		HIGH PRESSURE HYDRAULIC PF3/4x5000L	1
31	055		MESH PLASTIC SPRING HOSE 1" -1250mm	1
32	057		CLAMP 32-50	8
33	058		CLAMP 20-32	1
34	059		MESH PLASTIC HOSE 3/4"-1500mm	1
35	060	202-13-085	BASE MOTOR SUB ASS.	1
36	061		SCREW M8X30-12.9	12
37	062		WASHER 8	8
38	063		NUT M8-6-St	8
39	064		WASHER B8.4-St	8
40	065	202-13-090	SHEET	1
41	066	202-13-091	SHEET	2
42	068	192-02-049	PUMP SEAT	1
43	070		T JOINT 3/4" -B1	1
44	071		IV BALL VALVE 12	1
45	072		STRIGHT HOSE JOINT 3/4"PTx3/4"PH N.46	1
46	073		NIPPLE 3/4"	1

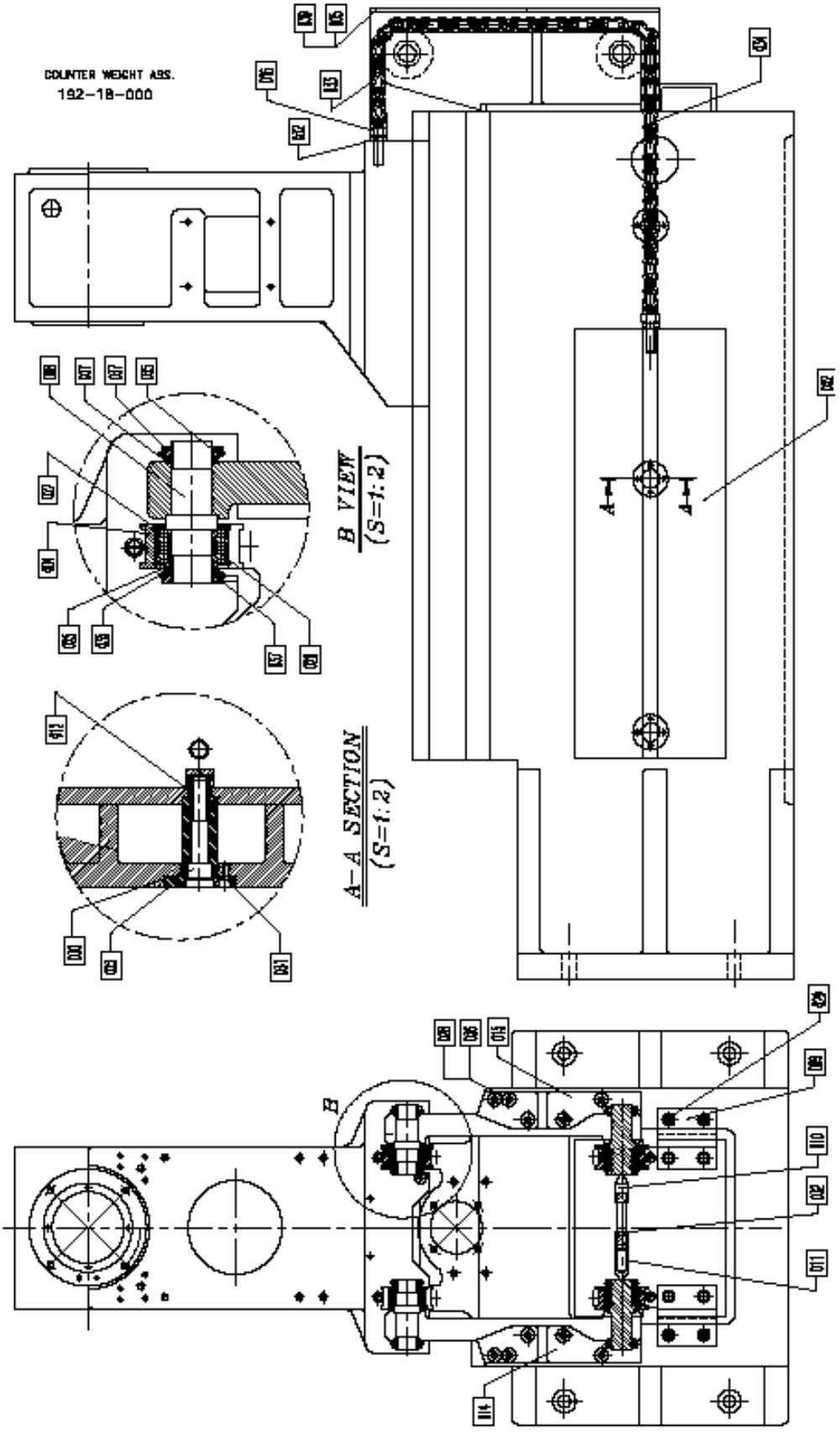


ATC ASS.
266-17-000

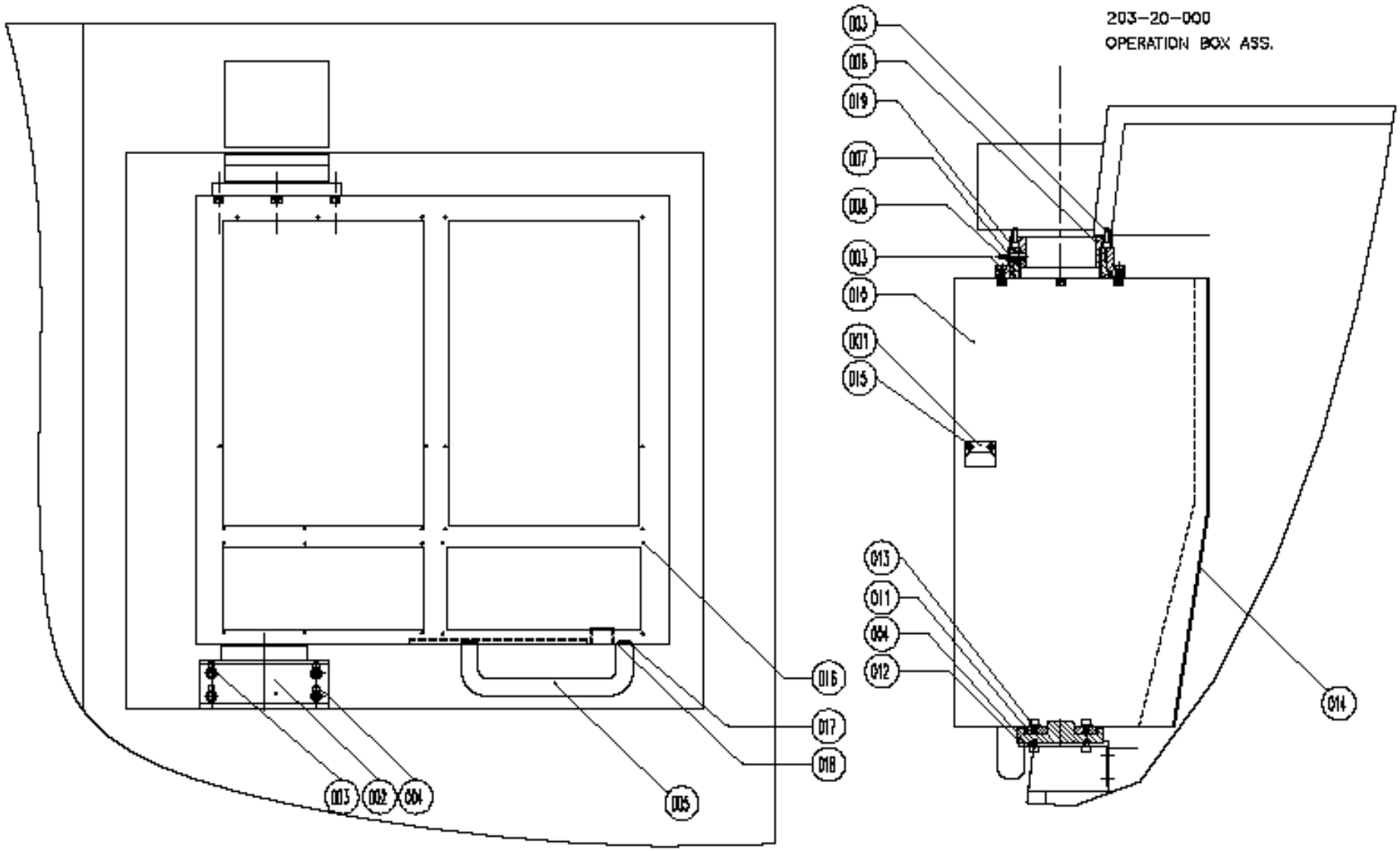


266-17-000 PART LIST : TOOL MAGAZINE ASS.

NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	001	266-17-001	BRACKET	1
2	002	266-17-002	ATC CATCH BT40-24LV	1
3	003	202-17-003	ADJUSTING BLOCK	2
4	004	202-17-004	ADJUSTING BLOCK	1
5	005		SCREW M12x45	6
6	006		SCREW M16x50	6
7	007		WASHER A17x30x3	6
8	008		SPRING WASHER 16-FST	6
9	009	202-37-009	ADJUSTING KEY	2
10	010		SCREW M5x16-8.8	4
11	011		WASHER 13 FORM A	6
12	012		SPRING WASHER 12-FST	6
13	013		PIN A10x40	4
14	014		SCREW M12x50-St	3
15	015		SCREW M12x75-St	1
16	016		NUT M12	1


COUNTER WEIGHT ASS.
192-18-000
B VIEW
(S=1:2)
A-A SECTION
(S=1:2)
A
A
B

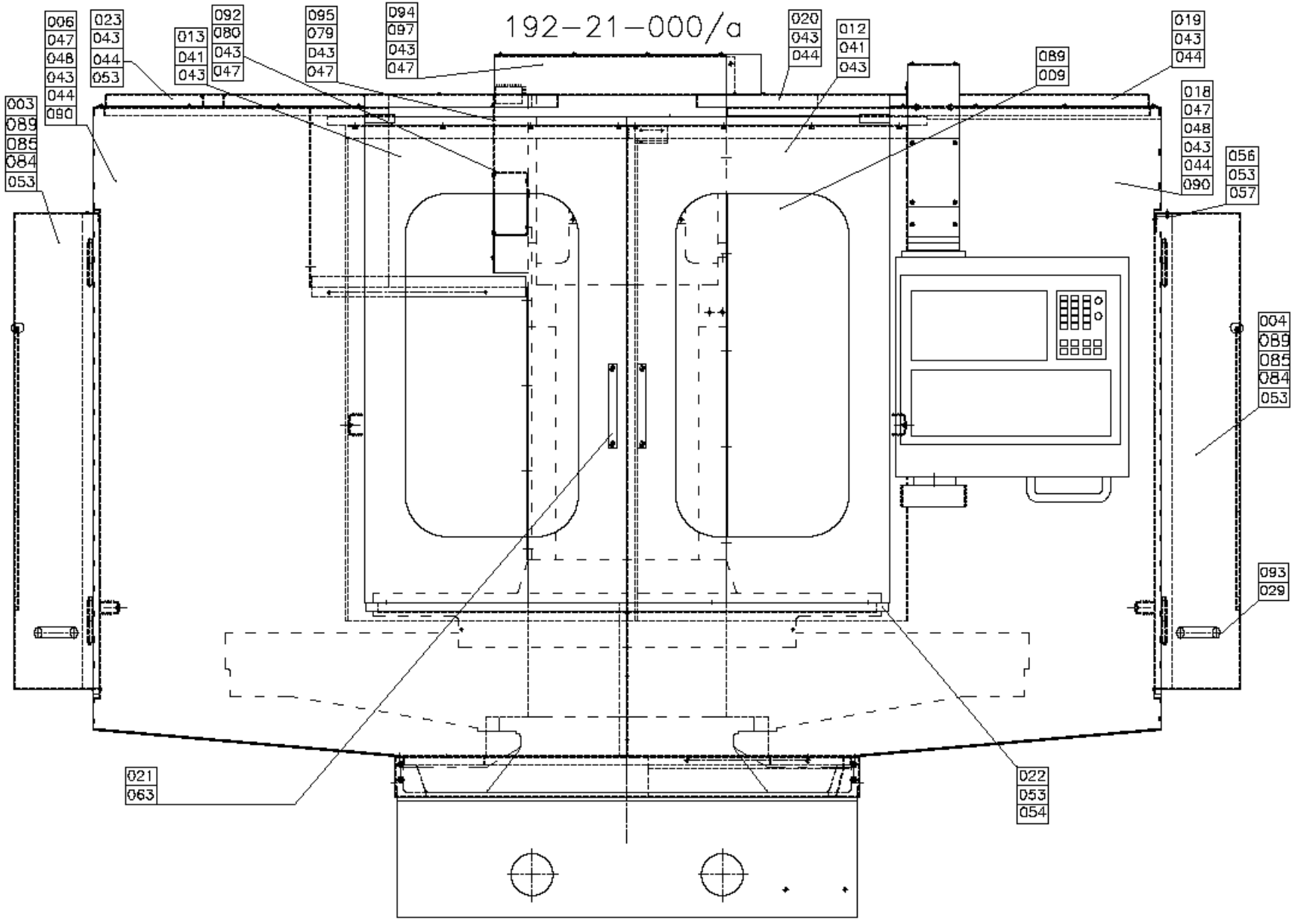
192-18-000			PART LIST: COUNTER WEIGHT SUB ASS.	
NO.	DRAWING NO.	POS.	TITLE DIMENSIONS	NO.OF PCS
1	192-18-000	000	COUNTER WEIGHT SUB ASS.	1
2	192-18-002	002	COUNTER WEIGHT SUB ASS.	1
3	192-18-003	003	COUNTER WEIGHT	1
4	192-18-004	004	SPROCKET WHEEL	4
5	192-18-005	005	TOP HEAD	1
6	202-18-007	007	WASHER	4
7	202-18-010	008	SPROCKET GEAR SHAFT	4
8	192-18-009	009	FIXING SEAT SUB ASS.	2
9	202-18-018	010	SUPPORT SHAFT	1
10	202-18-019	011	NUT	1
11	192-18-012	012	COUNTER WEIGHT GUIDE	2
12	202-18-014	014	TOP HEAD	1
13	202-18-015	015	TOP HEAD	1
14	192-18-016	016	LIFTING BOLT	4
15	192-18-017	017	SHEET	2
16	192-18-018	018	SHEET	2
17	192-18-019	019	SHEET	2
18	192-18-023	023	SUPPORT SHAFT	6
19	202-18-025	025	WASHER	8
20	URB	026	BEARING 6007-2ZR	8
21	DIN 472	027	SAFETY RING 62x2	8
22	DIN 912	028	SCREWM12x40-12.9	8
23	DIN 912	029	SCREW M14x40-12.9	8
24	DIN 912	030	SCREW M14x75-12.9	6
25	DIN 912	031	SCREW M6x14-12.9	24
26	DIN 934	032	NUT M16-6 ST	6
27	DIN 8152	033	CHIN CONNECTING SECTION A-LH1223	4
28	DIN 8152	034	SILENTCHAIN LH1223x68	2
29	DIN 127	036	WASHER B 12-FSt	8
30	JIS B 1554	037	NUT BEARING M35x1.5	8
31	DIN 580	038	EYE BOLT M16	1
32	JIS B 1174	039	SCREW M5x12	6


203-20-000
OPERATION BOX ASS.
003
006
019
007
008
003
019
031
015
013
011
004
012
014
016
017
018
001
002
004
005

	203-20-000		PART LIST: OPERATION BOX ASS.	
NO.	DRAWING NO.	POS.	TITLE DIMENSIONS	NO.OF PCS
1	203-20-001	001	FIXING SEAT	1
2	202-15-002	002	FIXING SEAT	1
3	DIN 912	003	SCREW M6X20-12.9	12
4	DIN 9021	004	WASHER A6.4-ST	12
5	GANTER	005	U-HANDLE GN 525-179	1
6	202-15-006	006	CRT RADIAL ARM	1
7	202-15-007	007	LOCKING NUT	1
8	202-15-008	008	ROTATING SEAT	1
9	203-20-010	010	OPERATION BOX	1
10	202-15-011	011	LINING SLEEVE	1
11	202-15-012	012	ROTATING SEAT	1
12	DIN 912	013	SCREW M6X10-12.9	8
13	203-20-014	014	OPERATION BOX COVER	1
14	JIS B 1174	015	SCREW M5X6	2
15	JIS B 1174	016	BUTTON HEAD SCREW M4X6	18
16	JIS B 1174	017	BUTTON HEAD SCREW M8X14	2
17	DIN 134	018	PLAIN WASHER 8.4	2
18	DIN 316	019	LOCK SCREW M8X35	1

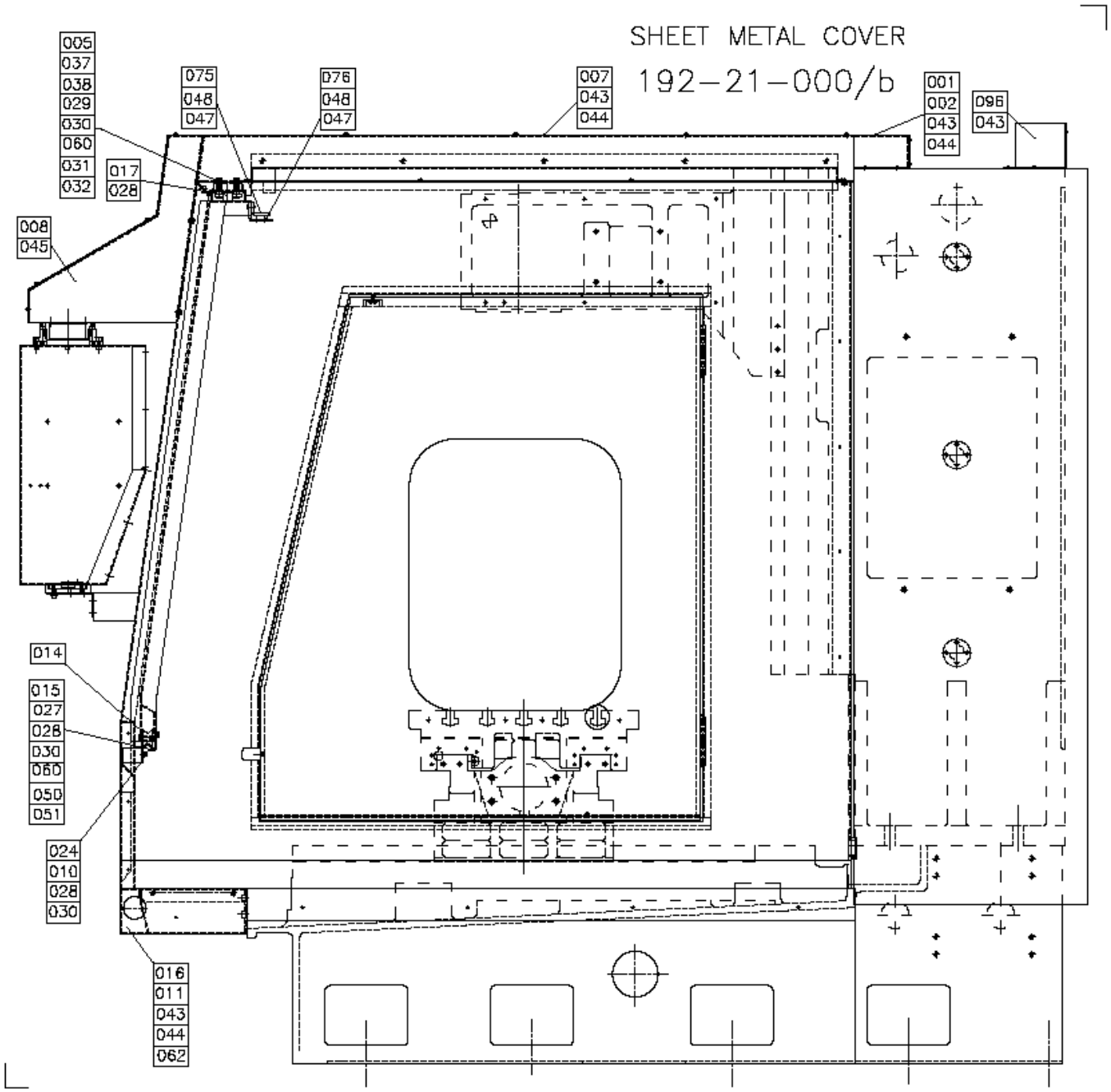
SHEET METAL COVER

192-21-000/a



SHEET METAL COVER

192-21-000/b



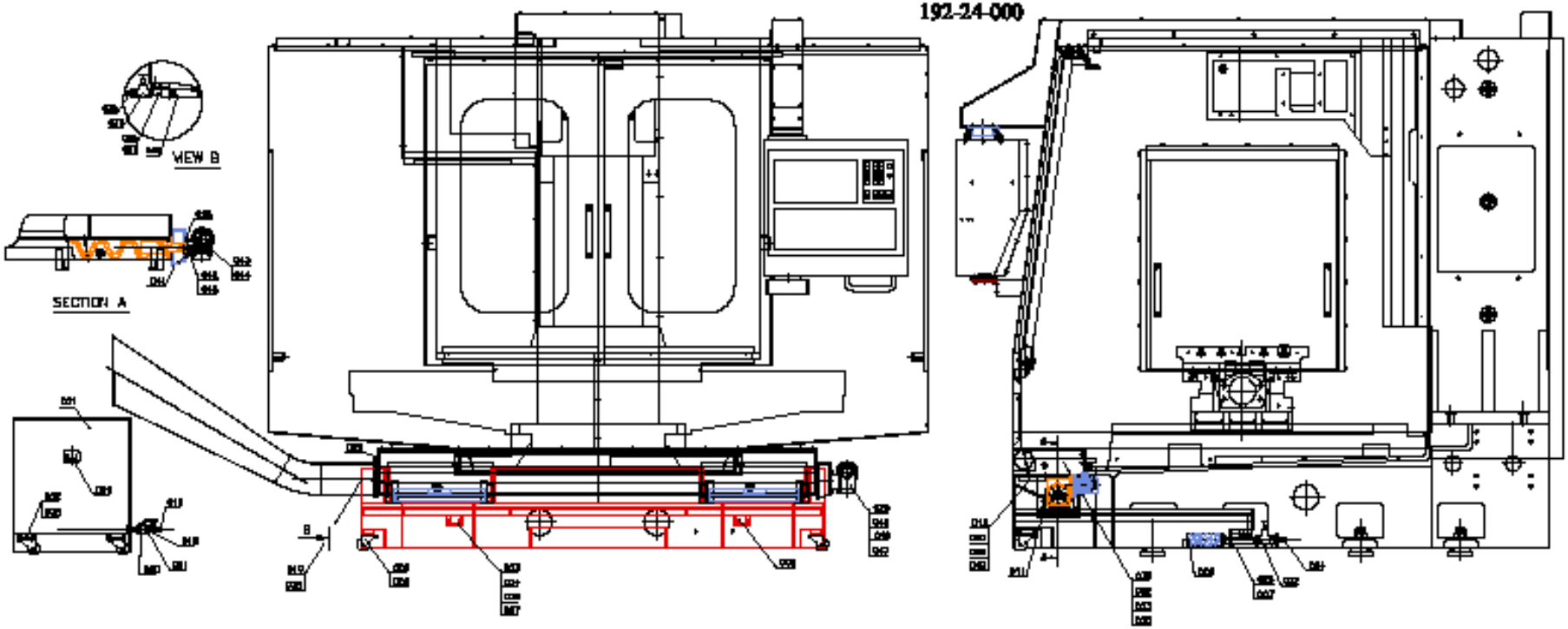
	TYPE: 192-21-000		part list	
NO.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	001	192-21-001	WIRE SLOT	1
2	002	192-21-002	COVER PLATE	1
3	003	192-21-003	LEFT SIDE COVER	1
4	004	192-21-004	RIGHT SIDE COVER	1
5	005	192-21-005	BEARING SEAT SUB ASS.	2
6	006	192-21-006	LEFT GUARD COVER	1
7	007	192-21-007	COVER PLATE	1
8	008	192-21-008	WELDING WIRE SLOT	1
9	009	192-21-009	ACRYLIC PLATE	2
10	010	192-21-010	RIGHT LOWER GUIDE WAY	1
11	011	192-21-011	PLATE	1
12	012	192-21-012	RIGHT FRONT DOOR	1
13	013	192-21-013	LEFT FRONT DOOR	1
14	014	202-21-014	DOOR ROLLER SEAT	4
15	015	192-21-015	TELESCOPE COVER BRACKET	4
16	016	192-21-016	FIXING SEAT	1
17	017	192-21-017	UPPER GUIDE WAY	2
18	018	192-21-018	COVER RIGHT GUARD	1
19	019	192-21-019	COVER	1
20	020	192-21-020	COVER	1
21	021		U-HANDLE GN525-179	2
22	022	192-21-022	PROTECTION ENCLOSURE	1
23	023	192-21-023	COVER	1
24	024	192-21-024	LEFT LOWER GUIDE WAY	1
25	027	202-21-015	MANDREL	4
26	028		SCREW M6x8-12.9	26
27	029		SCREW M6x12-12.9	12
28	030		WASHER 6.4-140HV	26
29	031		NUT M6-6-St	16
30	032		WASHER 6-FST	8

31	033	192-21-033	RIGHT DOOR	1
32	034	192-21-034	LEFT DOOR	1
33	035	192-21-035	PLATE	2
34	036	192-21-036	PLATE	2
35	037	192-21-037	BUSH	8
36	038	192-21-038	MANDREL	8
37	039	192-21-039	UPPER GUIDE WAY	2
38	040	192-21-040	UPPER GUIDE WAY	2
39	041	192-21-041	PLATE	2
40	043		SCREW M5x6	114
41	044		WASHER A5.3-St	68
42	045		SCREW M5x8-10.9	6
43	046		WELDING NUT M5	8
44	047		SCREW M6x12 10.9	35
45	048		WASHER A6.4-140HV	24
46	050		SCREW M4x10-10.9	4
47	051		WASHER 4.3-140HV	4
48	053		SCREW M4x6-10.9	40
49	054		WASHER A4.3-St	4
50	056	192-21-056	LOCK	2
51	057		SCREW M5x12 10.9	2
52	058		CONNECTORS PART NO.51804 BSPT/PT 3/8"	14
53	059		1/4" FLARE NOZZLES PART NO.51807	14
54	060		BEARING 626 2RS	16
55	062		SCREW M8x12-12.9	4
56	063		SCREW M8x16-12.9	4
57	066	192-21-066	STOPER PLATE SUB ASS.	2
58	067	192-21-067	STOPER PLATE	2
59	068	192-21-068	SCREW M5	4
60	069	192-21-069	LIMITED PLATE SUB ASS.	2
61	070	192-21-070	LIMITED PLATE	2
62	073	192-21-073	LEFT FRONT PLATE	1
63	074	192-21-074	RIGHT FRONT PLATE	1
64	075	202-21-089	ANGLE L50x32x5	1
65	076	202-21-090	ANGLE L56x36x5	1

66	078	192-21-078	U FORM	10
67	079	192-21-079	COVER	1
68	080	192-21-080	COVER	1
69	081	192-21-081	SIDE COVER	1
70	082	192-21-082	COVER	1
71	083	192-21-083	COVER	1
72	084	192-21-084	PLATE	2
73	085	192-21-085	ACRYLIC PLATE	2
74	086	192-21-086	SIDE COVER	1
75	087	192-21-087	COVER	1
76	088	192-21-088	COVER	1
77	089	192-21-089	PACKING	1
78	090		T JOINT-130 B[1-1]"	2
79	091	192-21-091	WIRE SLOT	1
80	092	192-21-092	CABLE CANAL	1
81	093		U-HANDLE GN525-86	2
82	094	192-21-094	CABLE CANAL	1
83	095	192-21-095	CABLE CANAL	1
84	096	192-21-096	CABLE CANAL	1
85	097	192-21-097	COVER	1
86	098	192-21-098	WIRE SLOT	1
87	099	192-21-099	WIRE SLOT	1

CHIP CONVEYOR

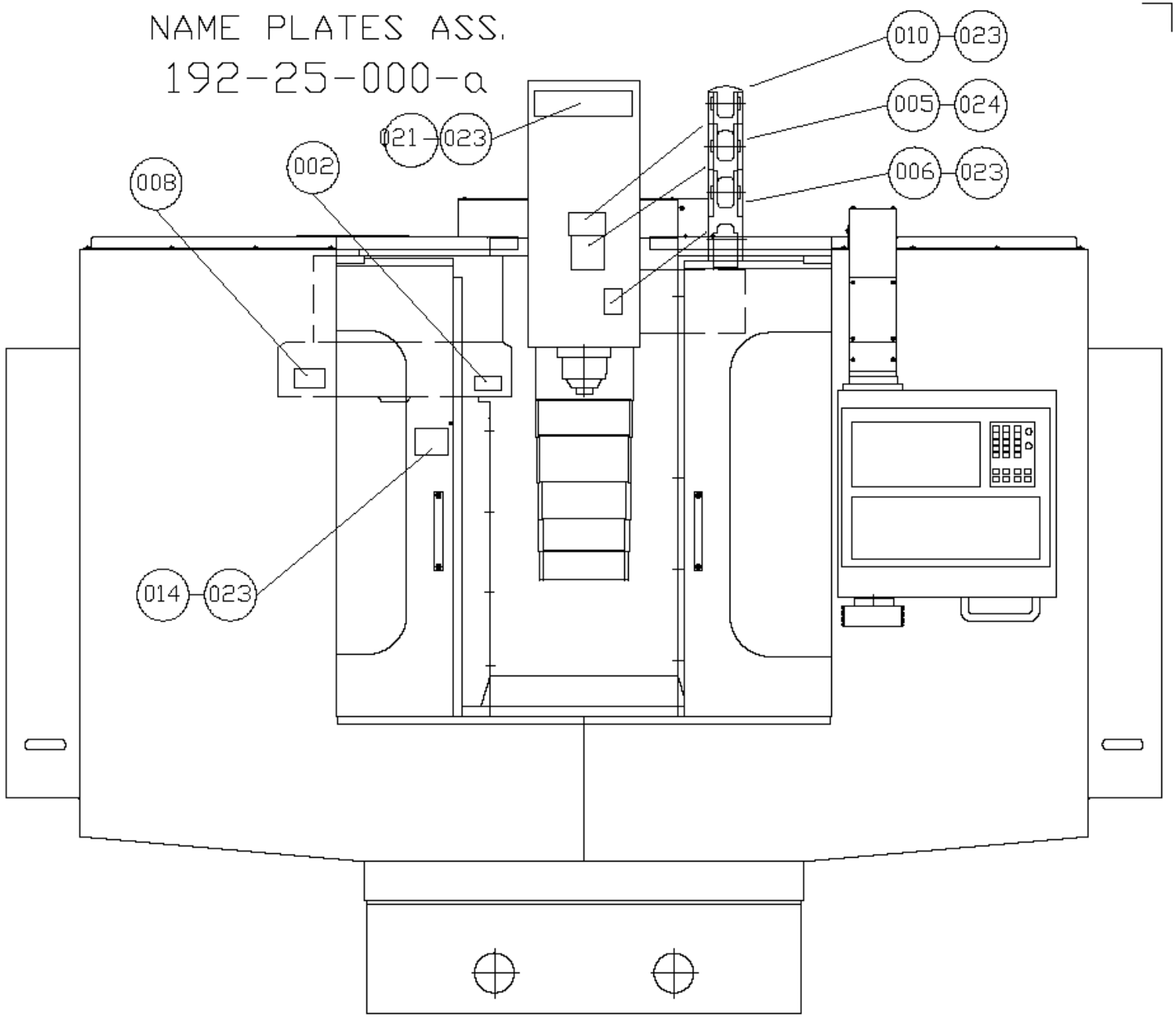
192-24-000



192-24-000			PART LIST:CHIP COLLECTOR SUB ASS.	
NO.	DRAWING NO.	POS.	TITLE DIMENSIONS	NO.OF PCS
1	ISO 3102	002	CASTER D=50	8
2	192-24-003	003	COOLANT TANK	1
3	192-24-004	004	COOLANT TANK FILTER	1
4	192-24-005	005	COOLANT TANK FILTER	2
5	TSWU KWAN	006	OIL FILTER MF-10	1
6	DIN 2950	007	PLUG 1/2"-T9	2
7	DIN 912	008	SCROW M6x10	32
8	192-24-010	010	STEEL PIPE	1
9	192-24-011	011	SCREW CHIP REMOVER	1
10	192-24-012	012	BASE	1
11	192-24-013	013	SHEET	1
12	192-24-014	014	SHEET	1
13	192-24-015	015	SHEET	2
14	202-21-016	016	PIPE	1
15	202-24-017	017	NET PLATE	1
16	DIN 3017	018	CLAMP 20-32	1
17	YOKOHAMA	019	NET PLASTIC HOSE 3/4"- 300mm	1
18	ADAPTERS	020	V BALL VALVE 08	1
19	DIN 3500	022	GATE VALVE-S RP 1 1/2"	1
20	ADAPTERS	023	STRAIGHT HOSE JOINT PT1/2"-120TY.2084	1
21	CHEN YING	024	STR.HSE JOINT PT1,1/2"XPE1,1/2"NO.46	1
22	JX	025	GEAR BOX NMRVO40-63B14-1/100 WITH MOTOR MS632-4-220/380V WITH SHORT TYPE BASE	1
23	202-21-031	026	WASHER	1
24	192-24-027	027	CHIP COLLECTOR	2
25	192-24-028	028	SHEET	1
26	DIN 7980	029	WASHER 8-FST	4
27	192-24-030	030	SHEET	1
28	DIN 913	031	SCREW M8x6	1
29	DIN 912	032	SCREW M6x10	20
30	DIN 439	033	NUT M6	20
31	DIN 912	035	SCREW M8x16	10
32	DIN 3500	037	GATE VALVE-S RP 1	1
33	ADAPTERS	038	STRAIGHT HOSE JOINT PT1"-120 TY2084	1
34	CHEN YING	039	STR.HSE JOINT PT1"XPE1"NO.46	2
35	DIN 933	040	SCREW M8X18-8.8	4
36	202-21-063	042	SHAFT	1
37	202-20-064	043	BUSH	1
38	DIN 912	044	SCREW M6X60-12.9	1
39	GIS B1174	045	SCREW M6X12	4
40	DIN 433	046	WASHER 6.4-140HV	4
41	DIN 7980	047	WASHER 6-FST	4
42	DIN 6885	048	KEY A6X6X18	2
43	DIN 433	049	WASHER 8.4-140HV	4

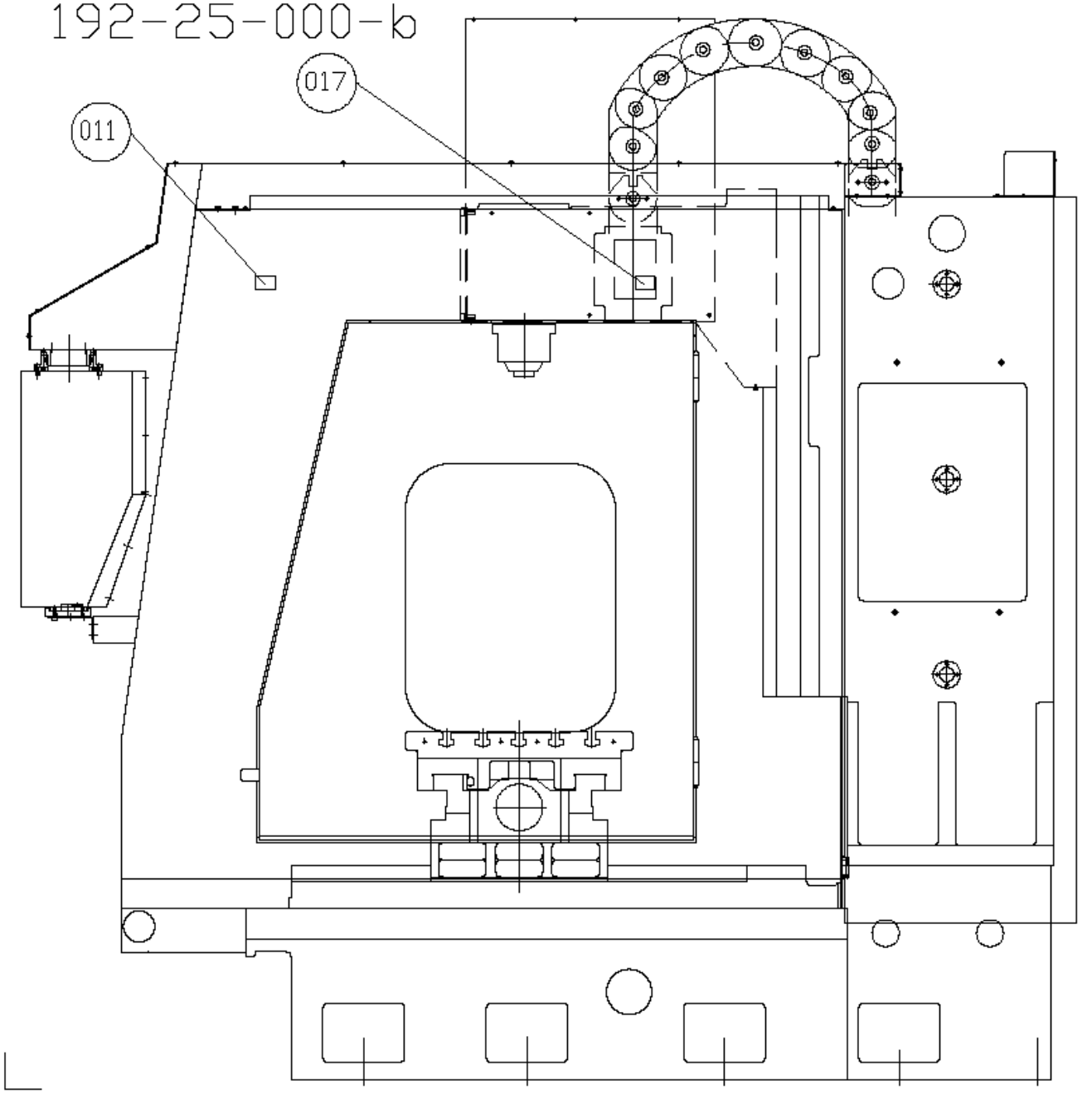
NAME PLATES ASS.

192-25-000-a

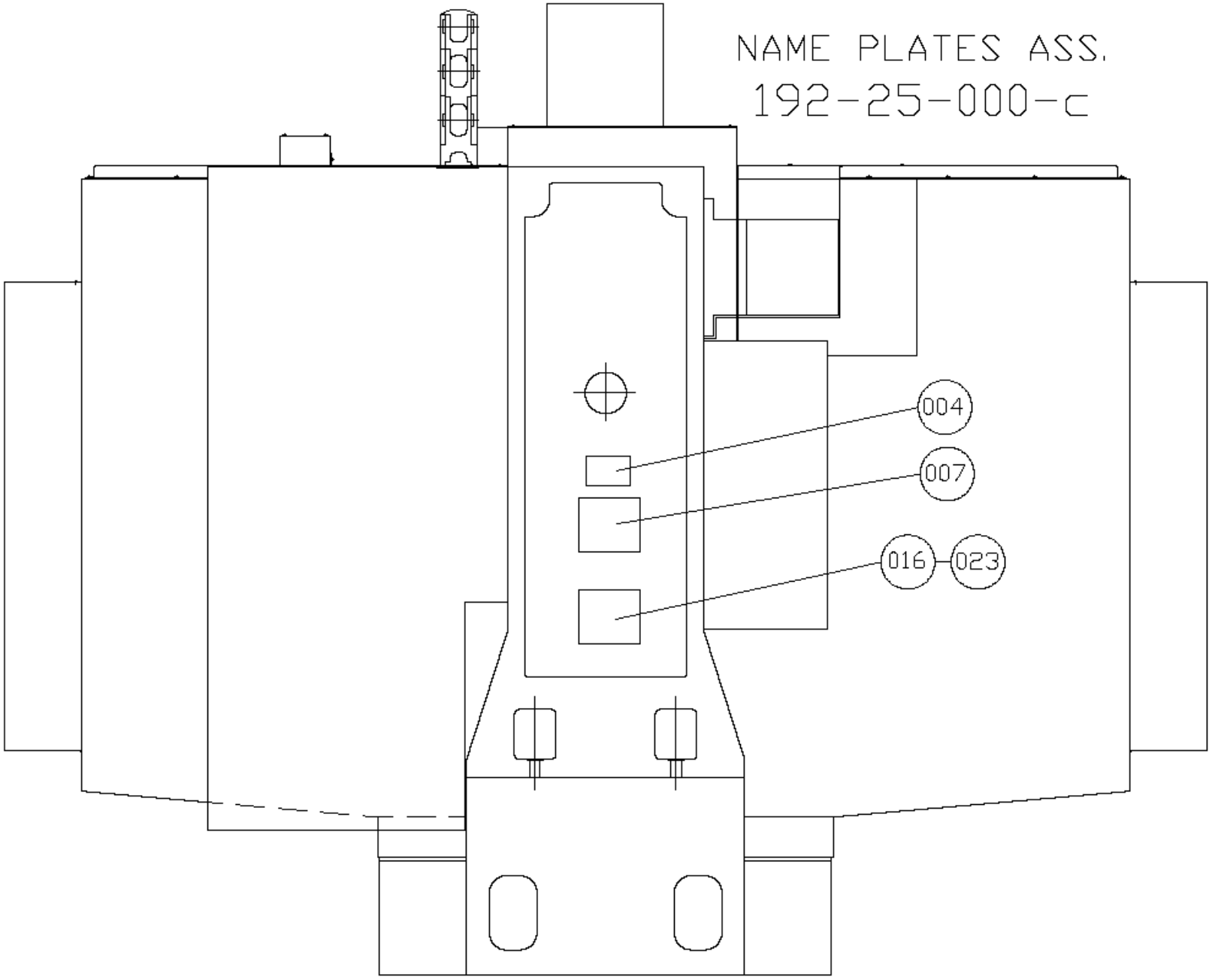


NAME PLATES ASS.

192-25-000-b



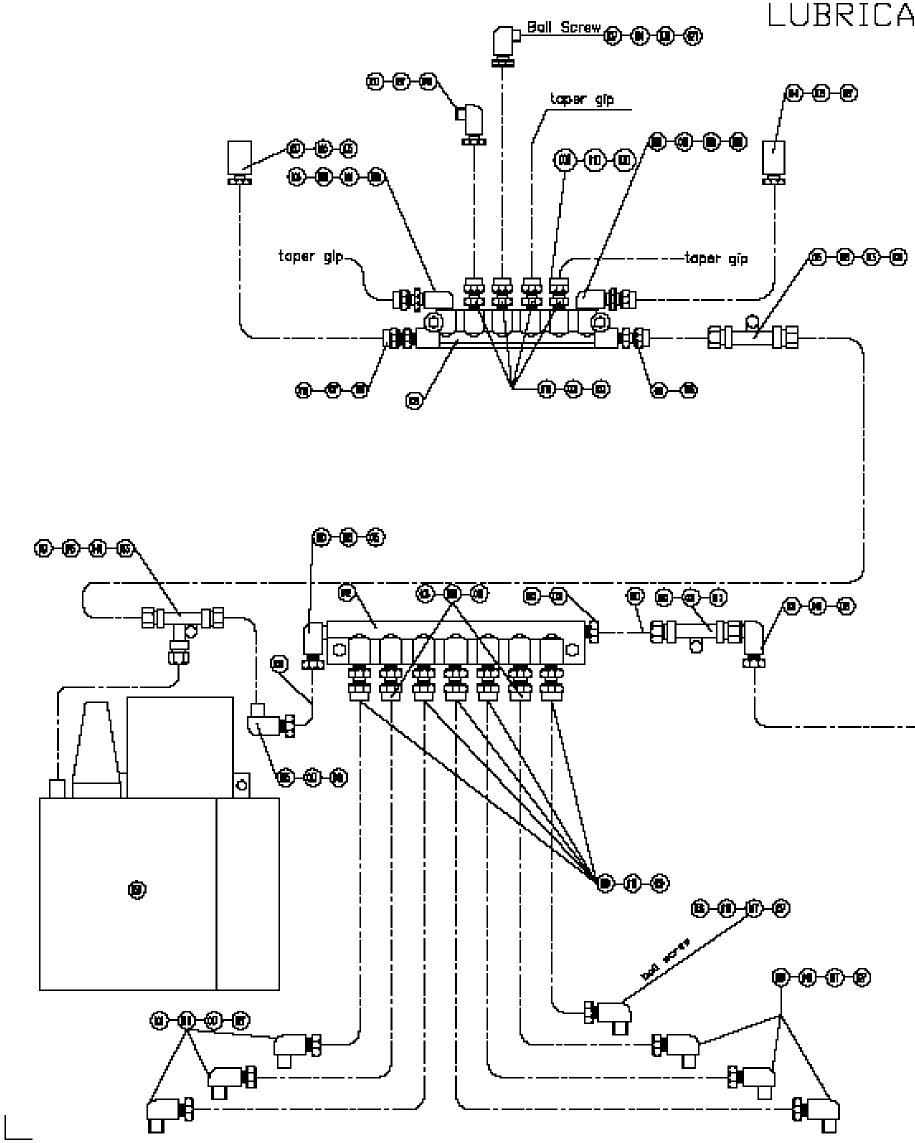
NAME PLATES ASS.
192-25-000-c

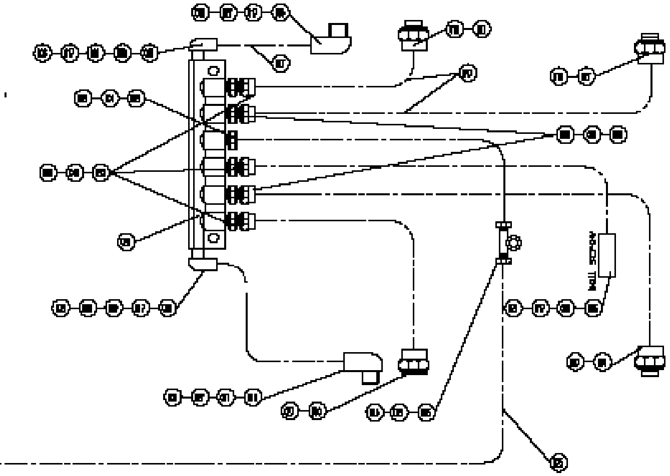


192-25-000 part list : NAME PLATE

no.	POS	Drawing NO./ Standard/ Source	Title Dimension	PCS
1	002	202-25-002	NAME PLATE ATC	1
2	004	202-25-004	NAME PLATE	1
3	005	202-25-005	NAME PLATE	1
4	006	202-25-006	NAME PLATE	1
5	007	202-25-007	NAME PLATE	1
6	008	192-25-008	NAME PLATE	1
7	010	202-25-010	NAME PLATE	1
8	011	202-25-011	NAME PLATE	1
9	014	202-25-014	NAME PLATE	1
10	016	202-25-016	NAME PLATE	1
11	017	192-25-017	NAME PLATE	1
12	021	192-25-021	NAME PLATE	1
13	023		NAIL F2.4x6	24
14	024		SCREW M4x10 -8.8	4

192-40-001
LUBRICATION Ass.





NOTE	NUMBER PCS.	TITLE DIMENSIONS	DRAWING NO.	POSITION
				001
				002
	16	COMPRESSION SLEEVE PA-4	CHEN YING	003
	6	STRAIGHT JOINT PD110	CHIBA	004
	16	THIMBLE NUT PA-4	TSMU KWAN	005
	10	ELBOW ADAPTER 90° PH-401	CHEN YING	006
	1	ELBOW ADAPTER 90° PH-301	CHEN YING	007
	6	CONTROLLER OF PROPORTION PSB2	TSMU KWAN	008
	20	SCREW JOINT PAMA	CHIBA	009
	29	COMPRESSION SLEEVE PB-4	CHEN YING	010
				011
				012
	3	JUNCTION 3-WAY JD-8	CHEN YING	013
				014
				015
				016
	1	PLASTIC TUBING WITH [illegible]	WILLY VOGEL	017
				018
				019
	1	PLASTIC TUBE [illegible]	WILLY VOGEL	020
	1	COPPER PIPE 4X1X2100	DIN 1755	021
				022
				023
				024
	1	HOSE ASSEMBLY [illegible]	CHEN YING	025

NOTE	NUMBER PCS.	TITLE DIMENSIONS	DRAWING NO.	POSITION
				026
	14	THIMBLE NUT PA-4	TSMU KWAN	027
				028
				029
	13	CONTROLLER OF PROPORTION PSB2	TSMU KWAN	030
				031
				032
				033
				034
	2	ELBOW PH-406	CHEN YING	035
	3	ELBOW 504 201 K	WILLY VOGEL	036
	1	ELBOW 504 411	WILLY VOGEL	037
				038
	2	OIL DISTRIBUTING SEAT [illegible]	TSMU KWAN	039
	3	ELBOW ADAPTOR 90° PH-814	CHEN YING	040
				041
	1	OIL DISTRIBUTING SEAT [illegible]	TSMU KWAN	042
	1	TEE CONNECTOR WITH [illegible]	WILLY VOGEL	043
				044
	3	CONE SLEEVE [illegible]	WILLY VOGEL	045
	3	SCREW [illegible]	WILLY VOGEL	046
	3	CONTOURED SOCKET [illegible]	WILLY VOGEL	047
				048
				049
[illegible]	1	LUBRICATOR PUMP		050