

# PART LIST

## *E SERIES*

VERTICAL MACHINING CENTER

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**VMC-2040**

## PART LIST

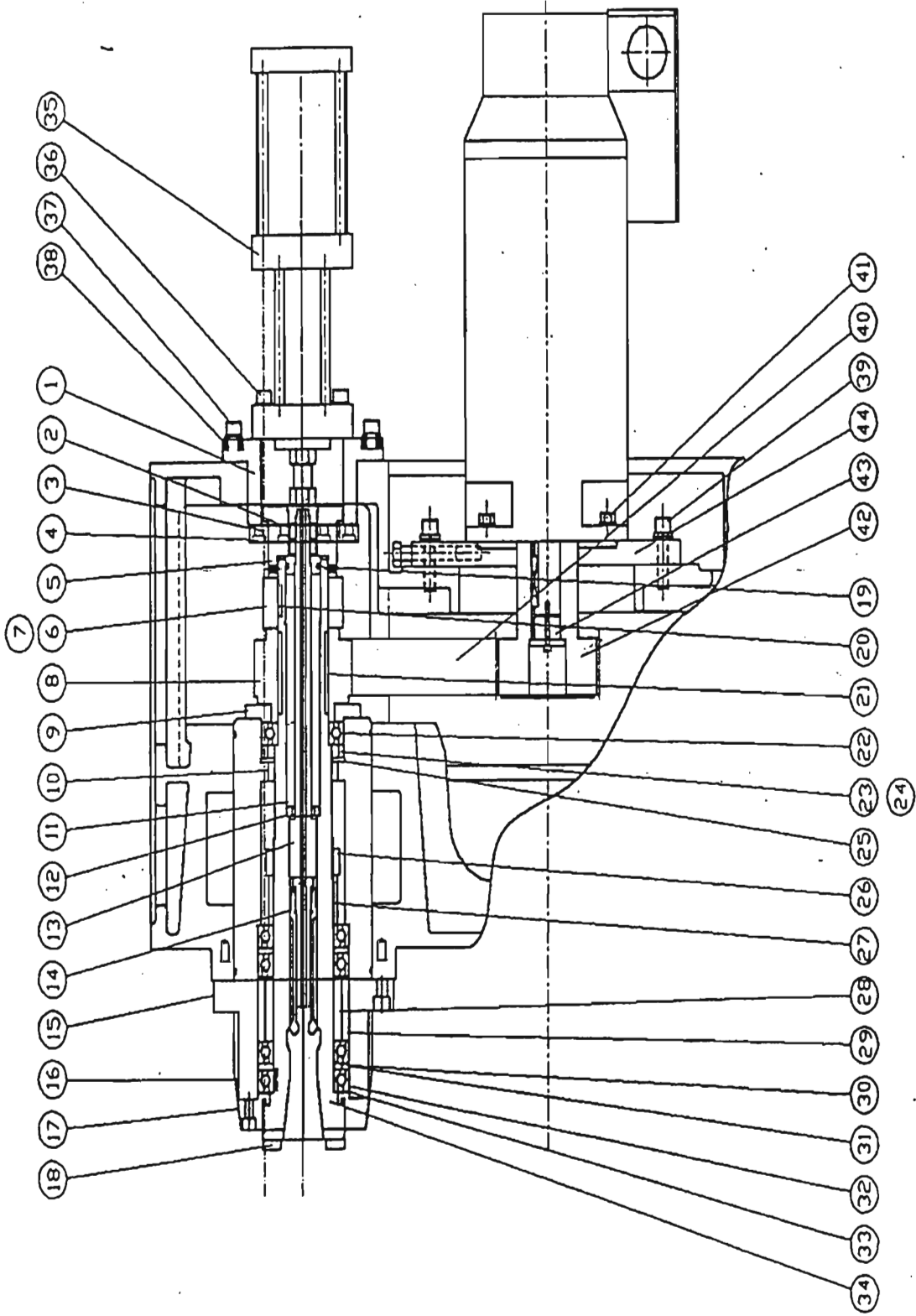
MACHINE MODEL : VMC-2040

SPINDLE ASSEMBLY

ASSEMBLY NO : CVEA5A01

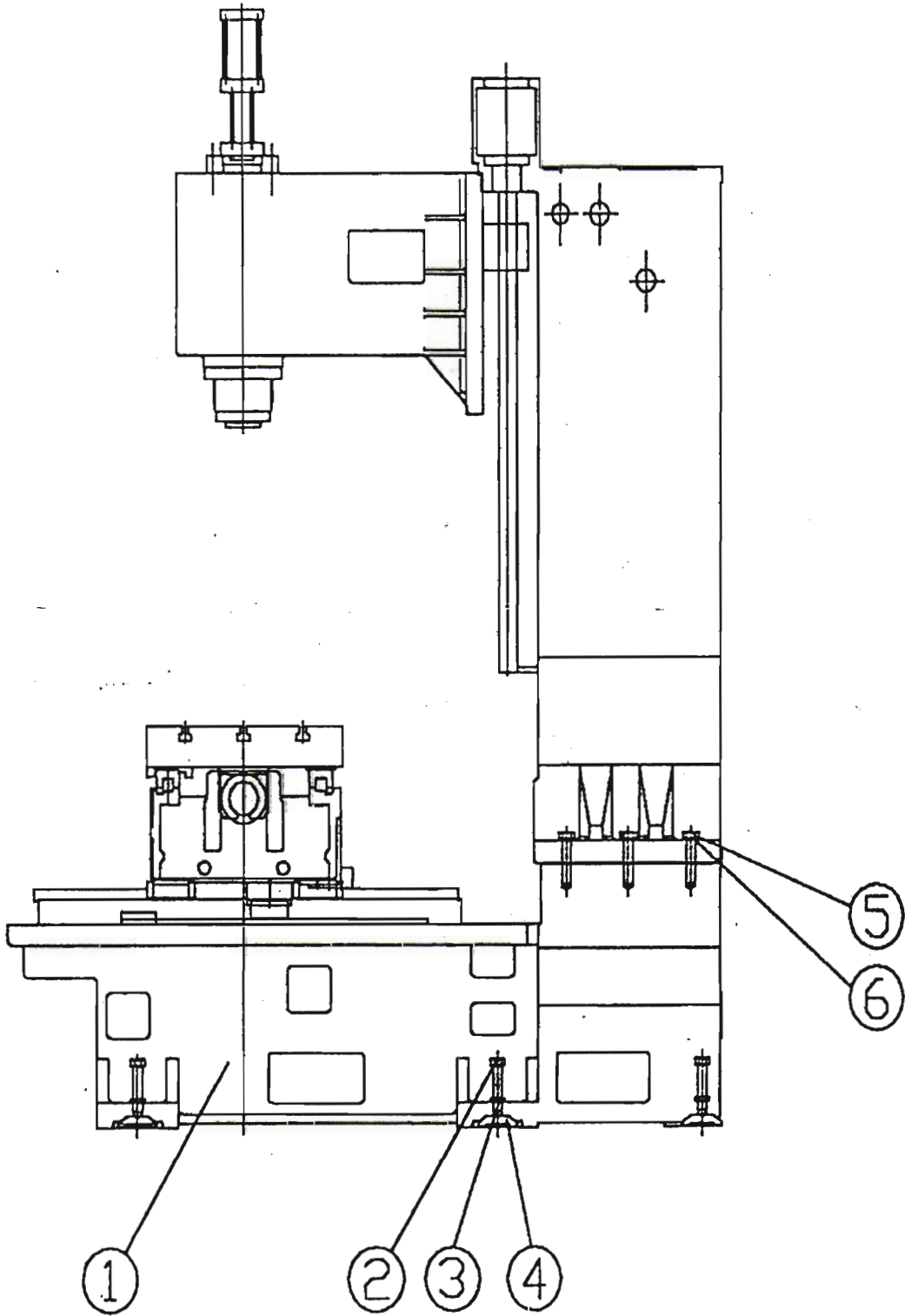
NO : 1

No.	PART No.	PART NAME / SPECIFICATION	Q'TY	REMARK
1	VEA511100	PULL COVER	1	
2	B18160000	NUT / M16*P2	2	
3	VEA511000	SUPPORT SEAT OF CLAMP/UNCLAMP CYLINDER	1	
4	B01080250	HEX. SOCKET BOLT / M8*P1.25*L25	2	
5	V2563100	LOCK NUT	1	
6	V2563010	SPINDLE ORIENTATION WHEEL	1	
7	V2563200	SPINDLE ORIENTATION DETECT BLOCK	1	
8	V2562901	PULLEY OF SPINDLE / 8YU*44T	1	
9	V2562800	SPINDLE END COVER	1	
10	V2563800	RING	1	
11	V2565500	SPRING DISC / 16H	1	
12	V2564900	COLLAR OF SPRING DISC	1	
13	V2564100	DRAW BAR	1	
14	V2565100	COLLECTOR	1	
15	V2562102	FRONT SLEEVE OF SPINDLE	1	
16	V2565700	SPINDLE NOSE SLEEVE (OPTINAL)	1	
17	V2562401	SPINDLE NOSE COVER	1	
18	V2562300	SPINDLE NOSE KEY	2	
19	V2565000	TOP SUPPORT COLLAR OF DRAW BAR	1	
20	B40207250	KEY / 7*7*25	1	
21	B40208650	KEY / 8*7*65	2	
22	V2563700	REAR WASHER	1	(ST)
23	V2565300	REAR SUPPORT BEARING / NSK 6011*P4	1	
24	V2565310	REAR SUPPORT BEARING / OPTI(12000rpm)	2	
25	V2565400	WAVE WASHER / BWW-6308	2	
26	B20460200	LOCK NUT / YSF-M60*P2.0	1	
27	V2563300	COLLAR	1	
28	V2562501	INNER COLLAR(MIDDLE)	1	
29	V2562601	OUT COLLAR(MIDDLE)	1	
30	V2563500	INNER COLLAR(FRONT)	1	
31	V2563600	OUT COLLAR(FRONT)	1	
32	V2565200	FRONT BEARING / KSK 7013C TYCBP4	3	
33	V2563900	NILOS RING / 6013-JU	1	
34	V2562201	SPINDLE	1	
35	B25G40130	SINGLE STEP AIR/OIL CYLINDER	1	
36	B01100400	SCREW / M10*P1.5*L40	4	
37	B01100400	SCREW / M10P1.5L40	4	
38	B41235200	COMPRESSION SPRING	4	
39	B01100350	SCREW(ADJUSTABLE PLATE) M10P1.5L35	4	
40	B48889400	PULLEY OF SPINDLE (TIMING BELT)	1	φ20-8YU-40
41	B01120350	SCREW (MOTOR) M12P1.75L35	4	
42	VEA518101	PULLEY OF SPINDLE MOTOR	1	SJ5.5*W8,SJ7.5A,
	VEA518111	PULLEY OF SPINDLE MOTOR	1	SJ7.5A(OP), α8
	VEA518120	PULLEY OF SPINDLE MOTOR	1	西門子PH7107
43	VEA518201	COVER OF MOTOR	1	SJ5.5, α6
	VEA518211	COVER OF MOTOR	1	SJ7.5, α6
	VEA518220	COVER OF MOTOR	1	西門子PH7107
44	V25661A1	ADJUSTABLE PLATE A OF SPINDLE	1	SJ5.5*W8,SJ7.5



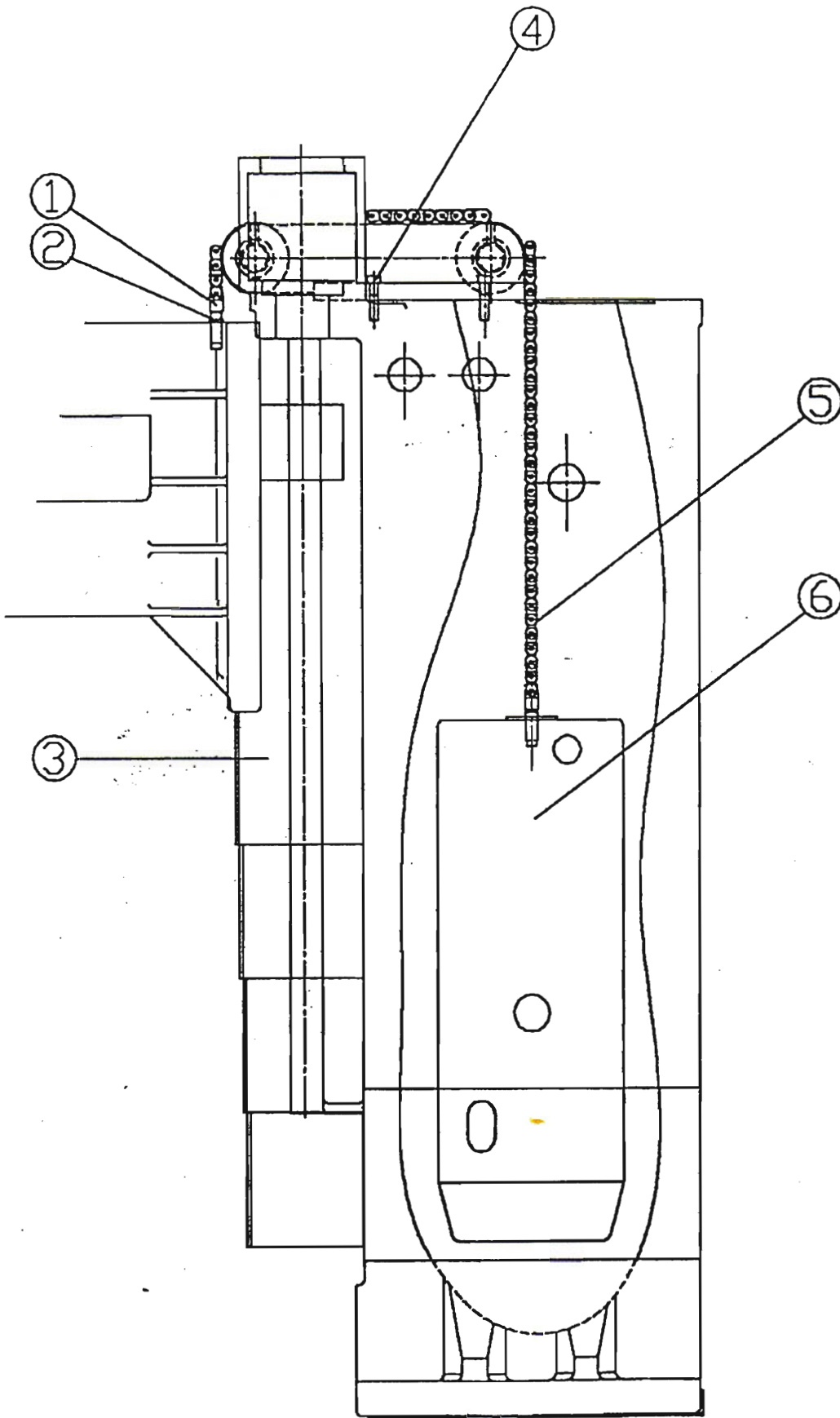
<b>ACER</b> TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種	VMC-2040L	圖號	CVEA5A01	比例	1:16
	TYPE		PART NO		SCALE	
	圖名	主軸內部機構/SPINDLE ASSEMBLY		版次	1	
	DESCRIP			VERSION	1	





<b>ACER</b> TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.		機種	VMC-2040L	圖號	CVEA1A01	比例	1:16
		TYPE		PART NO		SCALE	
		圖名	立柱與底座之結合/COLUMN&BASE COMBINATION ASSEMBLY	圖號		版次	1
		DESCRIP				VERSION	





**ACER**  
**TAIWAN SPRINGWOOD INTERNATIONAL, INC.**  
**FORMOSA SPRINGWOOD INTERNATIONAL, INC.**

機 種  
 TYPE

圖 名  
 DESCRIP

圖 號  
 PART NO

比 例  
 SCALE

版 次  
 VERSION

VMC-2040L

CVEA2A01

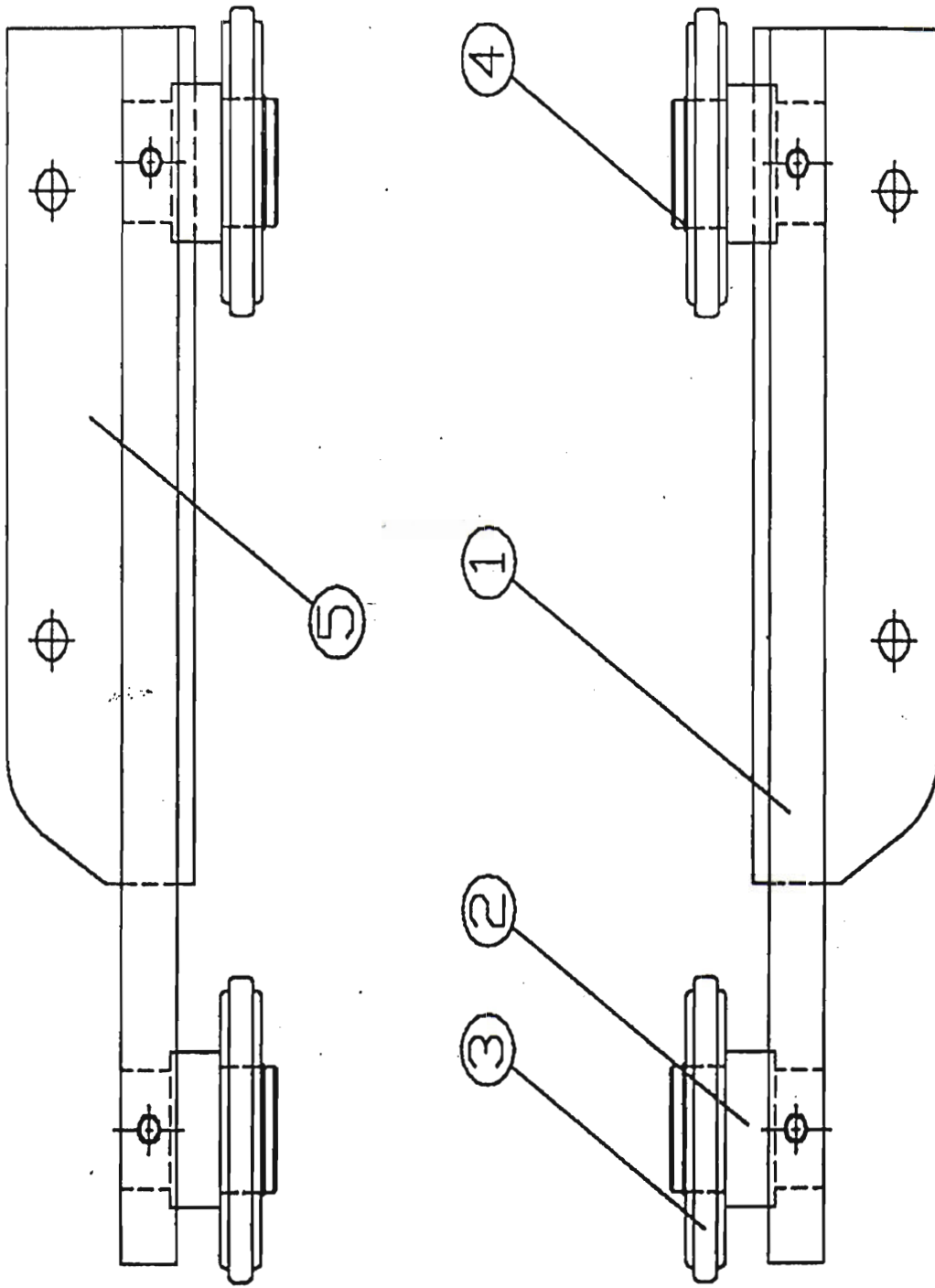
1:8

主軸頭與配重機構/HEADSTOCK & COUNTERWEIGHT ASSEMBLY

1

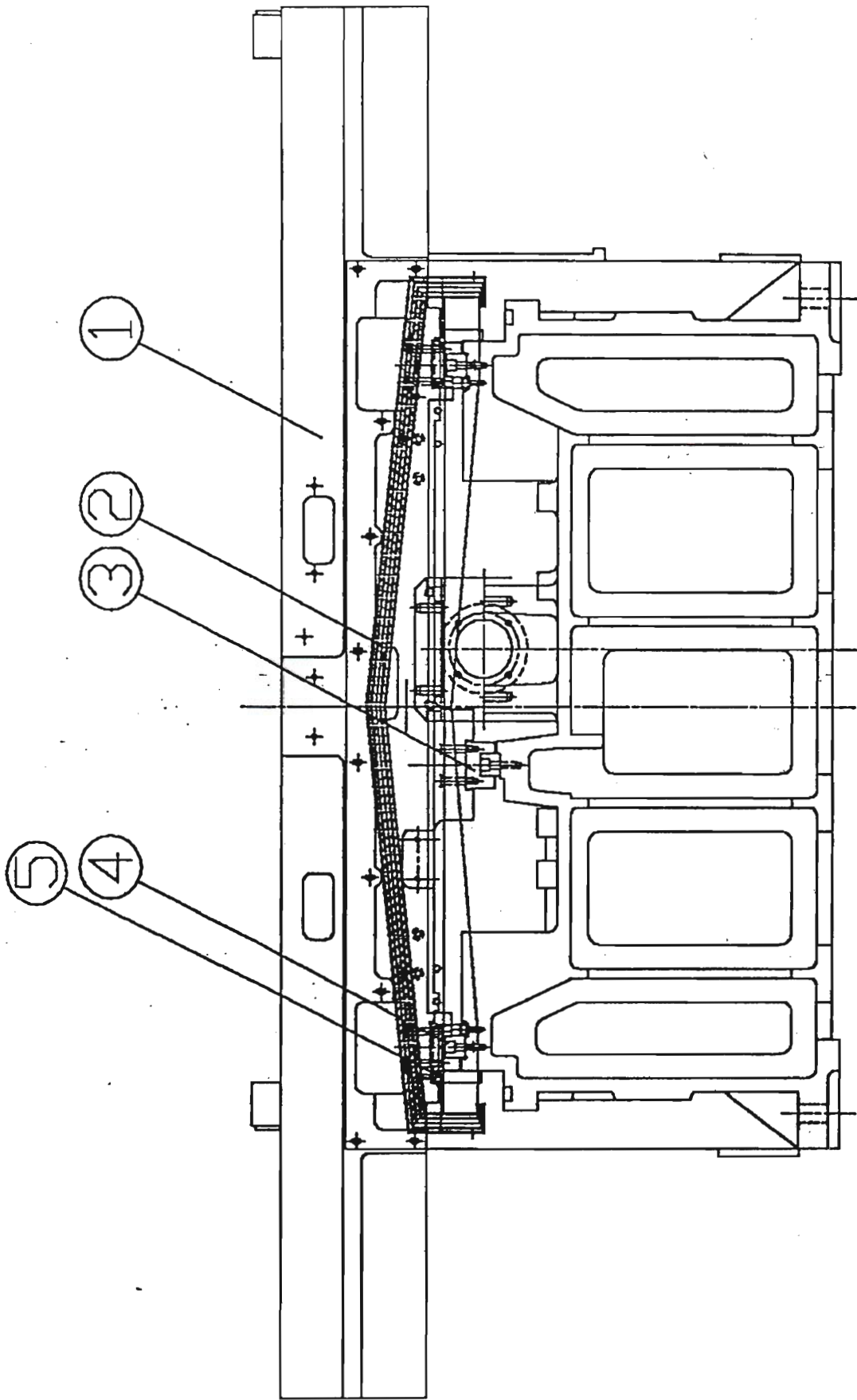






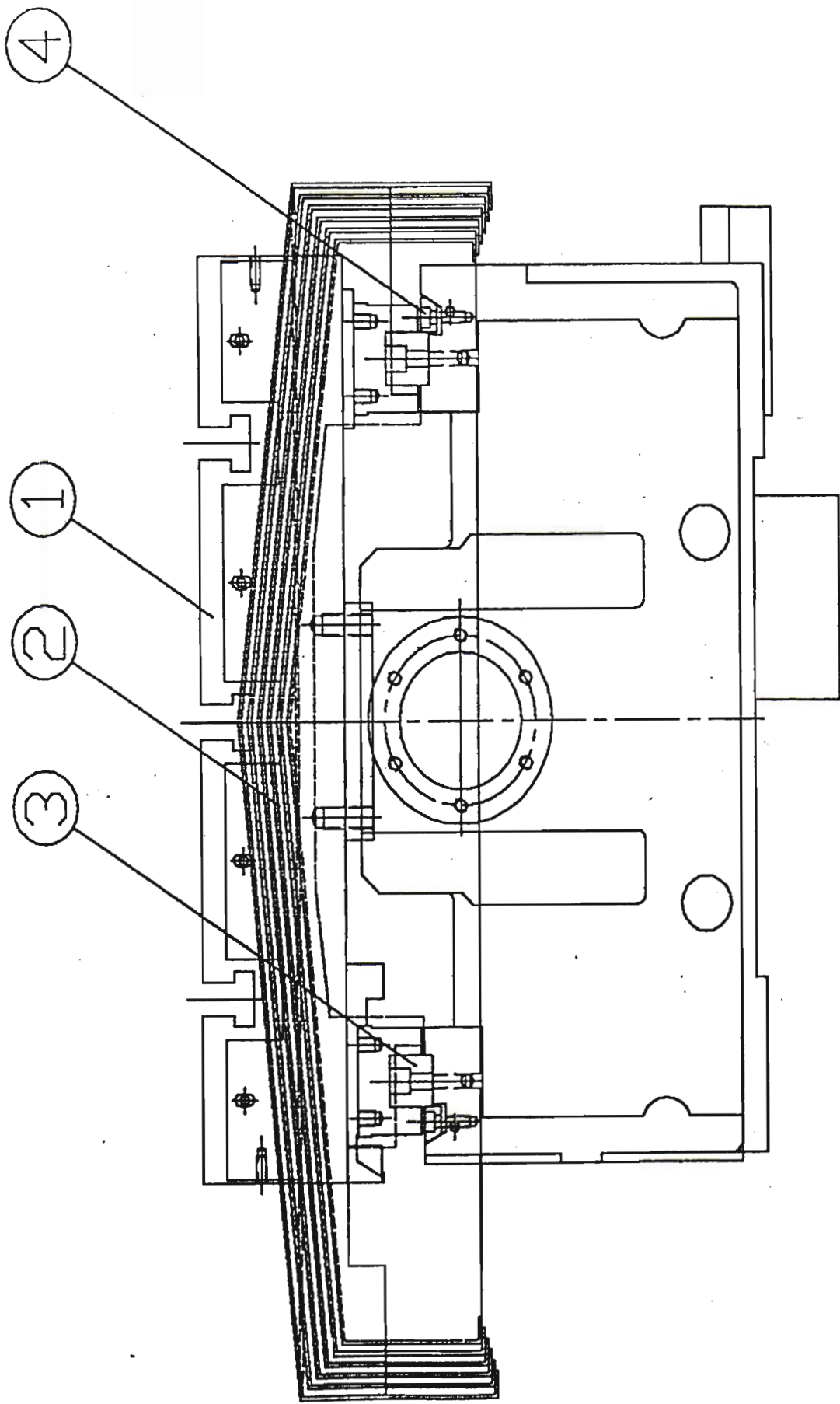
<b>ACER</b> TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機 種 TYPE	VMC-2040L 鏈輪座機構/SPROCKET SEAT ASSEMBLY	圖 號 PART NO	CVEA2A02	比 例 SCALE	1:3 版 次 VERSION
						1





<b>ACER</b> TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種 TYPE 圖名 DESCRIP	VMC-2040L 鞍座組合圖/SADDLE ASSEMBLY	圖號 PART NO CVEA3A01	比例 SCALE 1:8 版次 VERSION 1
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**ACER** TAIWAN SPRINGWOOD INTERNATIONAL, INC.  
 FORMOSA SPRINGWOOD INTERNATIONAL, INC.

機種名  
 TYPE DESCRIP

VMC-2040L

工作台組合圖/TABLE ASSEMBLY

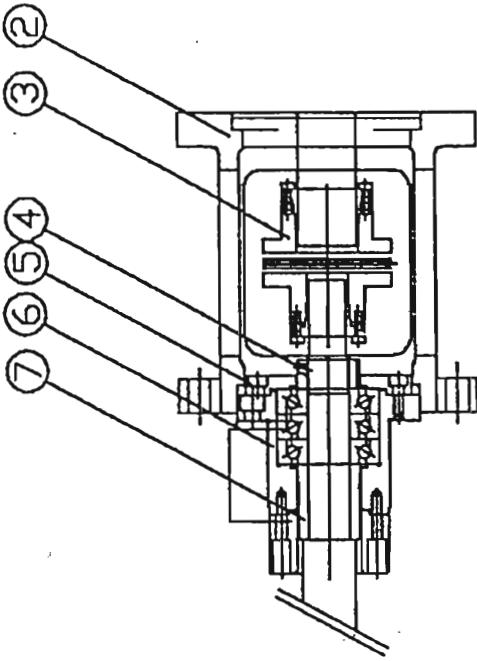
圖號  
 PART NO

CVEA4A01

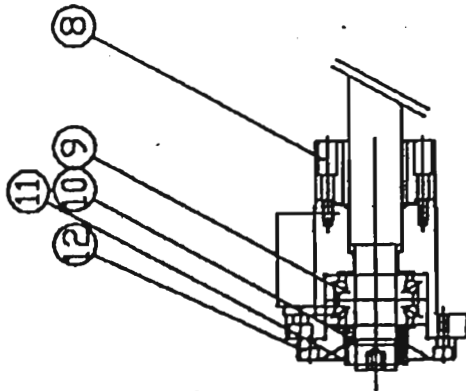
比例  
 SCALE  
 1:3.5

版次  
 VERSION  
 1

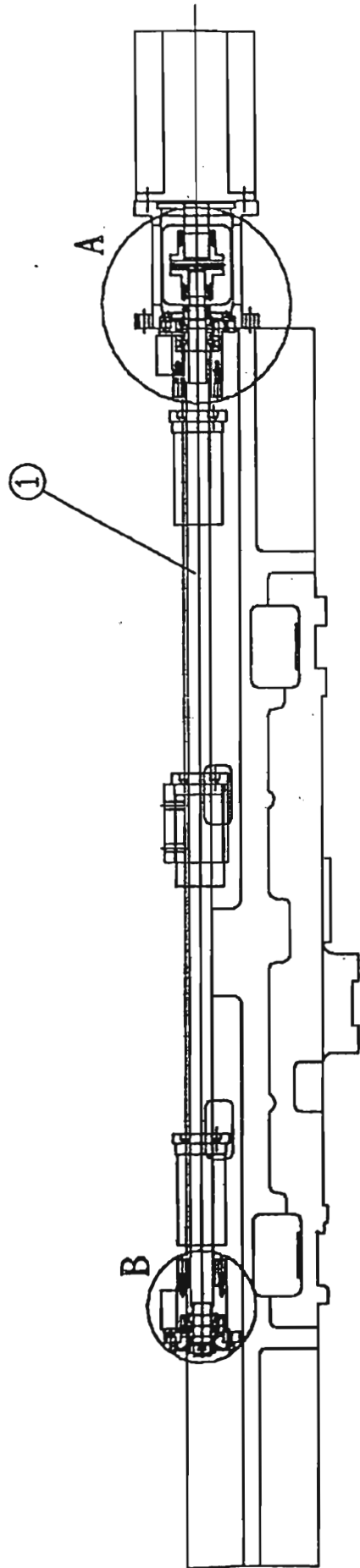




A-A part view



B-B part view

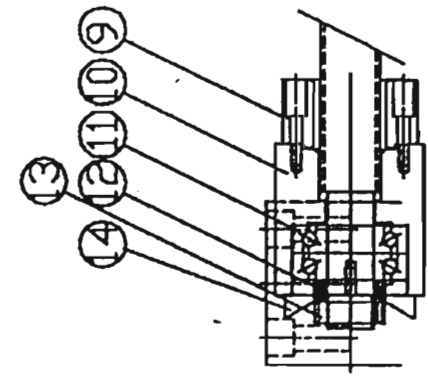


<b>ACER</b>		<b>TAIWAN SPRINGWOOD INTERNATIONAL, INC.</b>		機 種	VMC-2040L	圖 號	CVEA6X01	比 例	1:9
<b>FORMOSA SPRINGWOOD INTERNATIONAL, INC.</b>		X軸傳動機構/X-AXIS TRANSMISSION ASSEMBLY		TYPE		PART NO		SCALE	
				圖 名				版 次	1
				DESCRIP				VERSION	

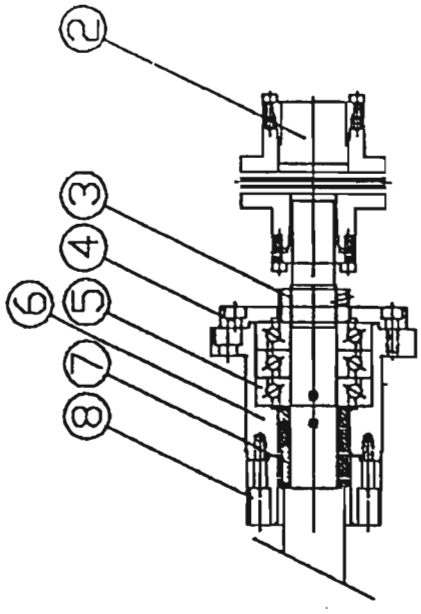




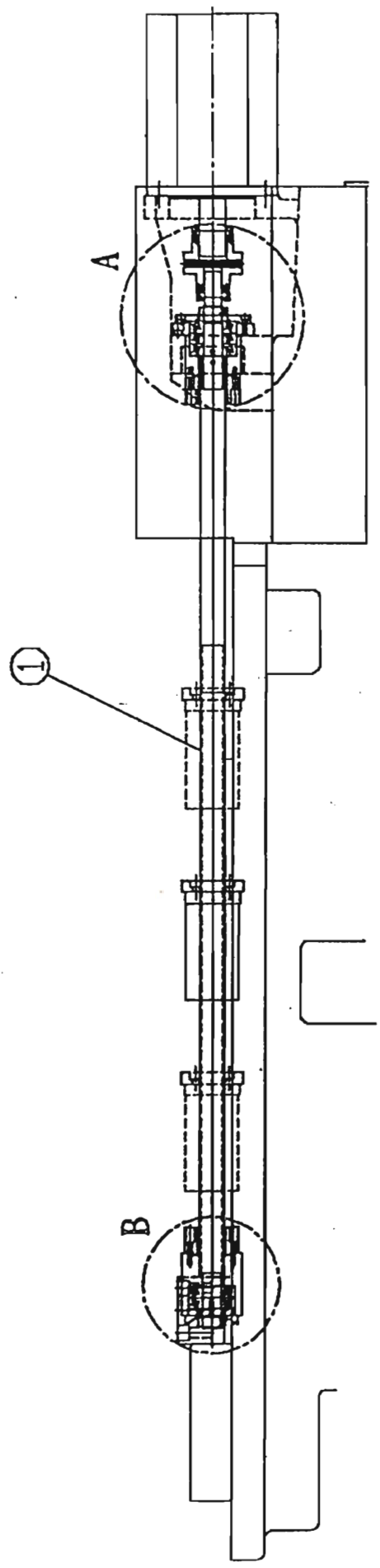




B-B partview

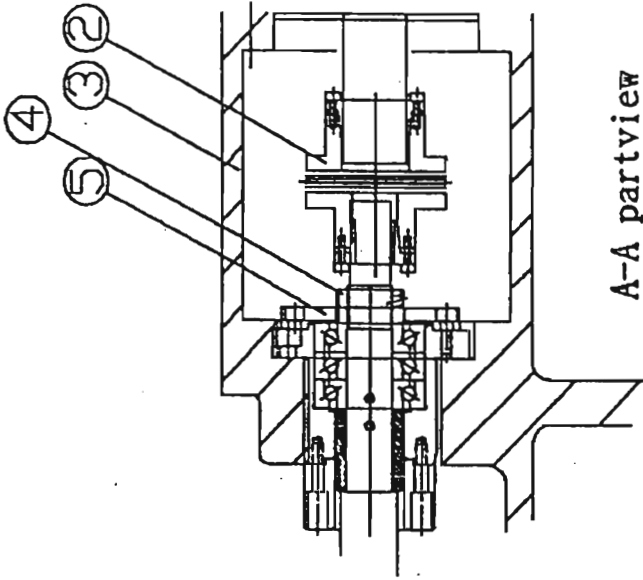


A-A partview

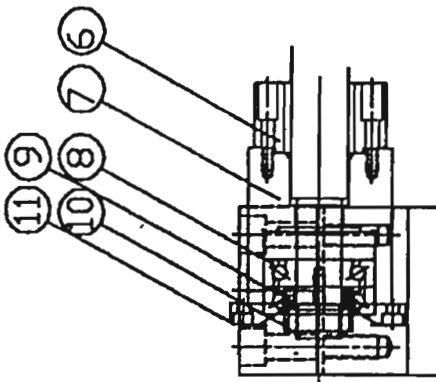


<b>ACER</b> TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種	VMC-2040L	圖號	CVEA6Y01	比例	1:8
	TYPE		PART NO		SCALE	
	圖名	Y軸傳動機構/Y -AXIS TRANSMISSION ASSEMBLY				
	DESCRIP					
			版次	1	VERSION	1

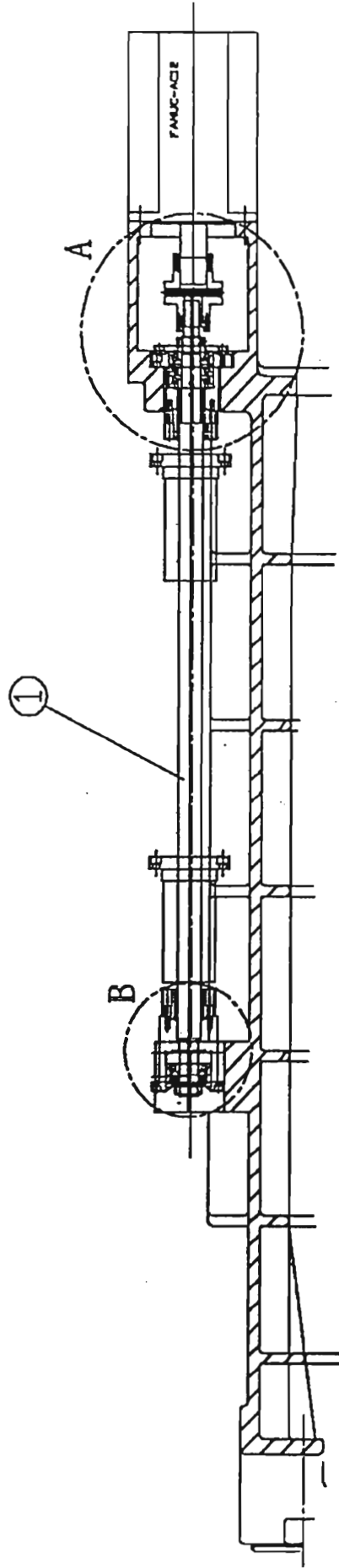




A-A partview



B-B partview



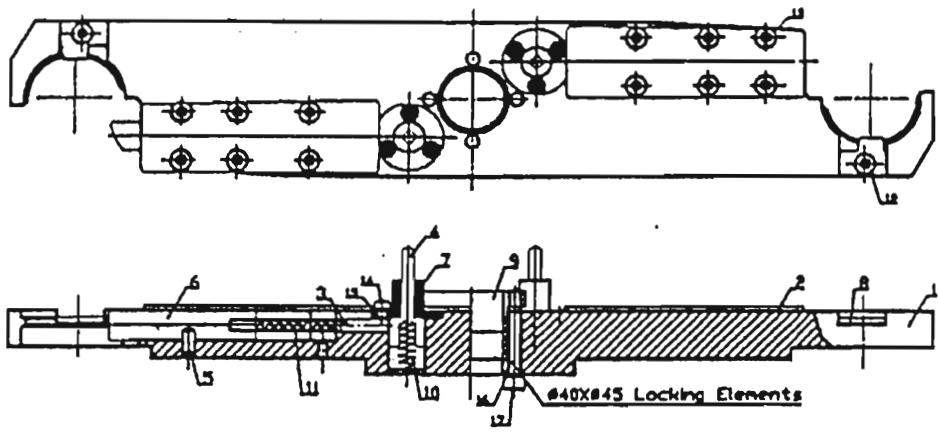
<b>ACER</b>	TAIWAN SPRINGWOOD INTERNATIONAL, INC.	FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機	種	VMC-2040L	圖	號	CVEA6Z01	比	例
			TYPE	名	Z軸傳動機構/Z-AXIS TRANSMISSION ASSEMBLY	PART NO	SCALE	1:8		
			圖	DESCRIP				版	次	1
								VERSION		

# CAT-40 & BT-40 DISK-TYPE AUTOMATIC TOOL CHANGING SYSTEM

## INSTRUCTION

1. This system is using cylindrical cam reel to reducing the speed by gear, the cylindrical cam is driven by an motor, this motor attached with automatic power off brake, to produce the indexing angle and positioning the POT. While POT is on position, the pneumatic cylinder will drive the flat type cam, to make the clamping jaws goes up and down, the movement of the clamping jaws will also drive the POT to rotate horizontally or upright, and this will make the tool changing to be quick & smoothly.
2. Every single rotation cycle of cylindrical cam will drive the POT for one indexing, and in every 360° rotation of the cylindrical cam, there are 270° to be the angle of movement of the cam, and 90° to be the angle of non-movement. This design will helps the brake motor to stop and positioning. (The rotation angle of the brake motor will be  $45^{\circ} \pm 20^{\circ}$ )
3. The effective rotate angle for the clamping cam is approximately 100°, 10° plus on both the left and right side to be the angle of non-movement.
4. The motor is 3 phases, 220V 200W. The gear reducing ration is 1:20, the attached automatic power off brake can be rotate either clockwise (CW) or counter clockwise (CCW). For every single indexing, the using time theoretically is 0.7 second, and the complete indexing cycle (24 index) will take 16.8 seconds.
5. The travel of clamping cylinder is  $\psi 50\text{mm} \times 100\text{mm}$ , detected by magnetic ring.
6. The solenoid valve is 2 phases, 24V, 1/4"PT. (For pneumatic ATC).
7. The Proximity Sensors: brand name: BALLUFF (ISO-9001) REG NO: 19279-01 Specification : M12 x 1, detecting distance 2mm, Voltage: 10-30V DC  $\cong 130\text{mA} \cong 800\text{HZ}$  PNP 3 cords.
8. The distribution diagram of the pneumatic cylinder and electro magnetic valve & cam-type connecting diagram of circuit are in showed fig(1). (For pneumatic ATC).
9. Tool capacity: 24 standard tool magazine with tool sleeve, max. Tool size: 80mm or 106mm.
10. Max. Tool length: 300mm.
11. Max. Tool weight: 8Kg.
12. The material of the POT is Nylon mixture with 33% glass fiber, one piece forged, with the tolerance of the weight up to 100Kg, and the highest thermo tolerance is 120°C to -20°C.
13. The counting and positioning of the rotation is controlled by PLC, through the detection of the proximity sensors, this tooling system can rotate clockwise (CW) or counterclockwise (CCW). To execute the tool indexing by selecting the nearest path.
14. The total weight of the automatic tool changing system, is approximately 140Kg, the clamping arm and cover excluded, (the weight of the body and tool plate is light, but still carry high rigidity, the cylinder and drive motor are located on the back side of tool magazine, to bring the convenience for maintenance & repair.)
15. The drawing and size of the tool magazine please reference to fig(2).

# Arm ass'y



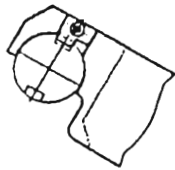
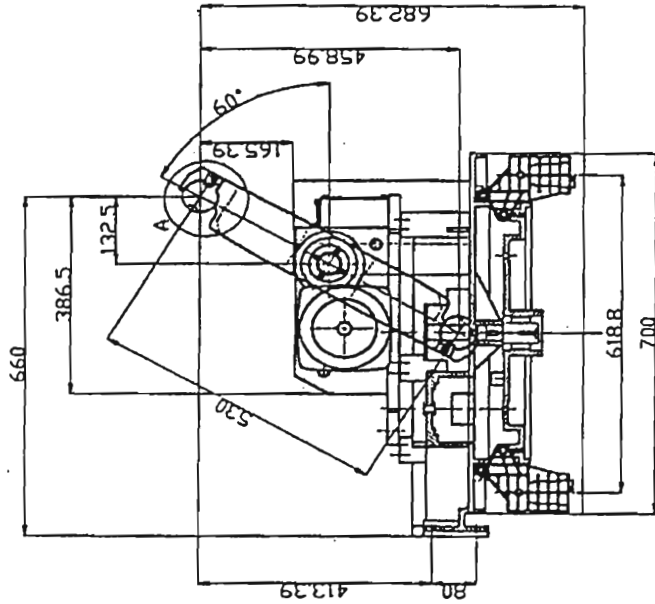
NO.	Part no.	Description	Specification	Dim:	Quantity
1	MB-4025	Arm	BT \ CAT \ HSK	430 mm	1
				460 mm	1
				500 mm	1
				530 mm	1
				600 mm	1
2	MB-4028	Case	430 mm	114 mm	2
			460 mm	129 mm	2
			500 mm	149 mm	2
			530 mm	164 mm	2
			600 mm	199 mm	2
3	MB-4029	Movement pin	430 mm	65 mm	2
			460 mm	80 mm	2
			500 mm	100 mm	2
			530 mm	115 mm	2
			600 mm	150 mm	2
4	MB-4030	Pin	BT	64 mm	2
			CAT	62 mm	2
			Dex2 BT	54 mm	2
			Dex2 CAT	52 mm	2
5	MB-4031	Pin		$\psi 8 \times 16L$	2
6	MB-4032	Stop Movement			2
7	MB-4033	Pin Plate	Standard	24 mm	2
			Dex2	21 mm	2
8	MB-4034	Home key	60°		2
			65°		2
			70°		2
9	MB-4035	Case			1
10		Spring 1	$\psi 1.1 \times \psi 9 \times 14T \times 41L$		2
11		Spring 2	$\psi 1.2 \times \psi 11 \times 20T \times 78.5L$		2
12	Commercial Products	Hexagon Head Bolt	M6 $\times$ 1P $\times$ 10L		2
13	Commercial Products	Hexagon Head Bolt	M6 $\times$ 1P $\times$ 10L		12
14	Commercial Products	CAP Bolt	M6 $\times$ 1P $\times$ 12L		6
15	Commercial Products	Washer	$\phi 6$		6
16	Commercial Products	Washer	$\phi 6$		4
17	Commercial Products	CAP Bolt 44	M8 $\times$ 1.25P $\times$ 55L		4



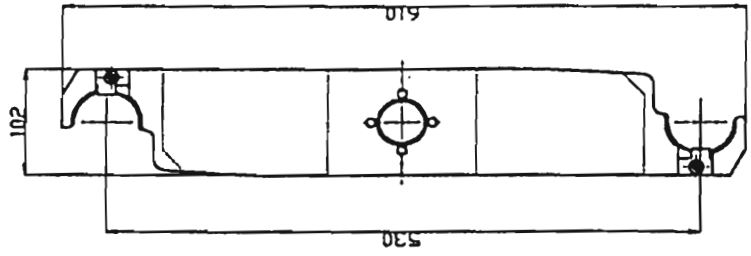
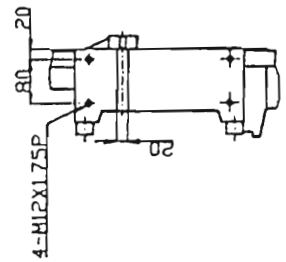
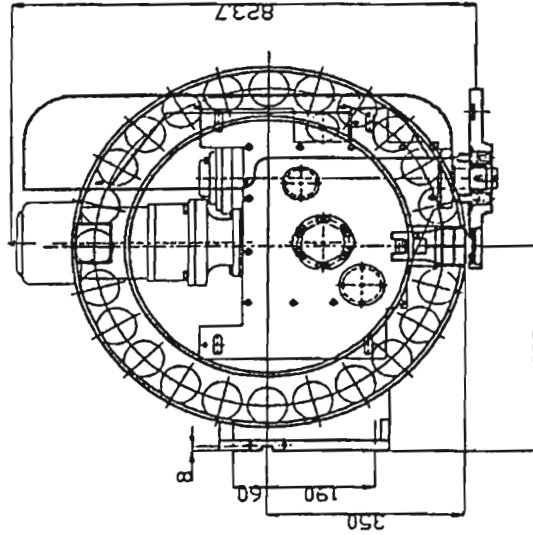
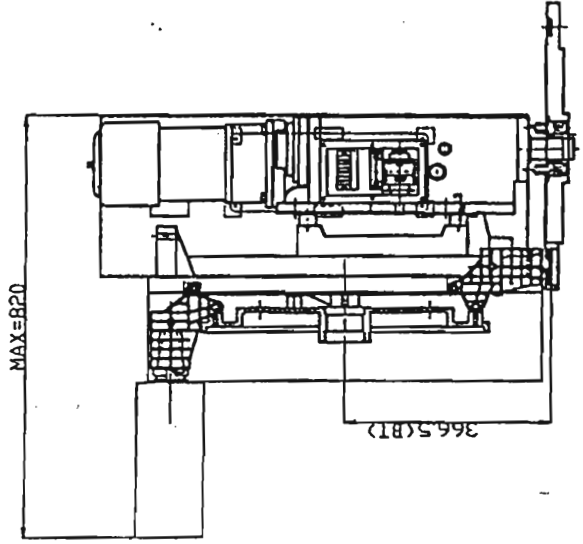
刀具規格

換刀時間:1.5秒(60Hz)  
 最大刀重:8kg  
 最大刀長:300mm  
 刀庫重量:280kg

刀具型式:MAS 403 BT-40  
 拉栓型式:MAS 403 P40T-1  
 刀具數量:24刀  
 最大刀徑:1.滿刀狀態:φ81  
                   2.鄰空刀狀態:φ162  
 刀庫電源:220V/60Hz(三相)  
 ATC電源:220V/60Hz(三相)

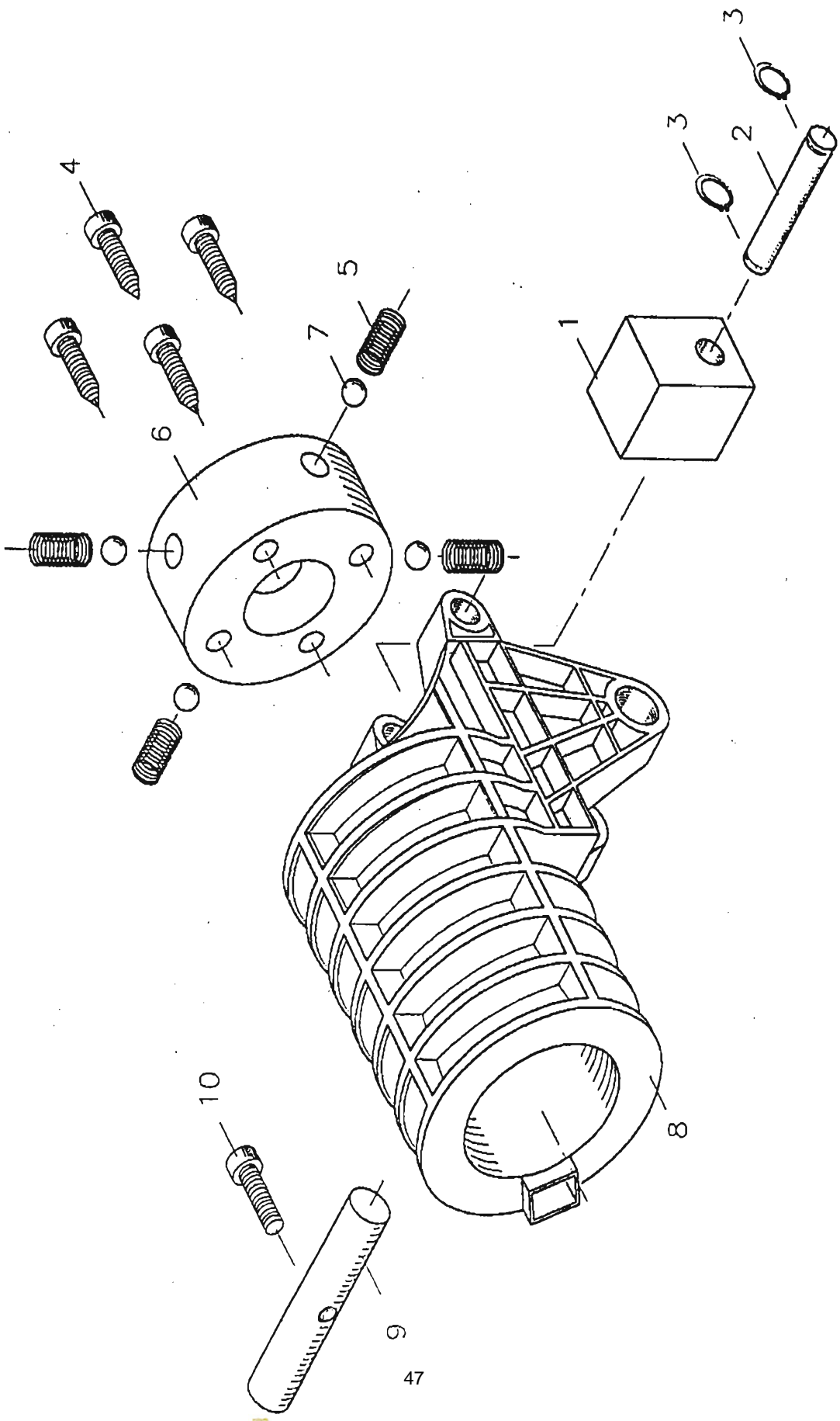


A詳圖 S=2/1



刀庫規格 S=2/1

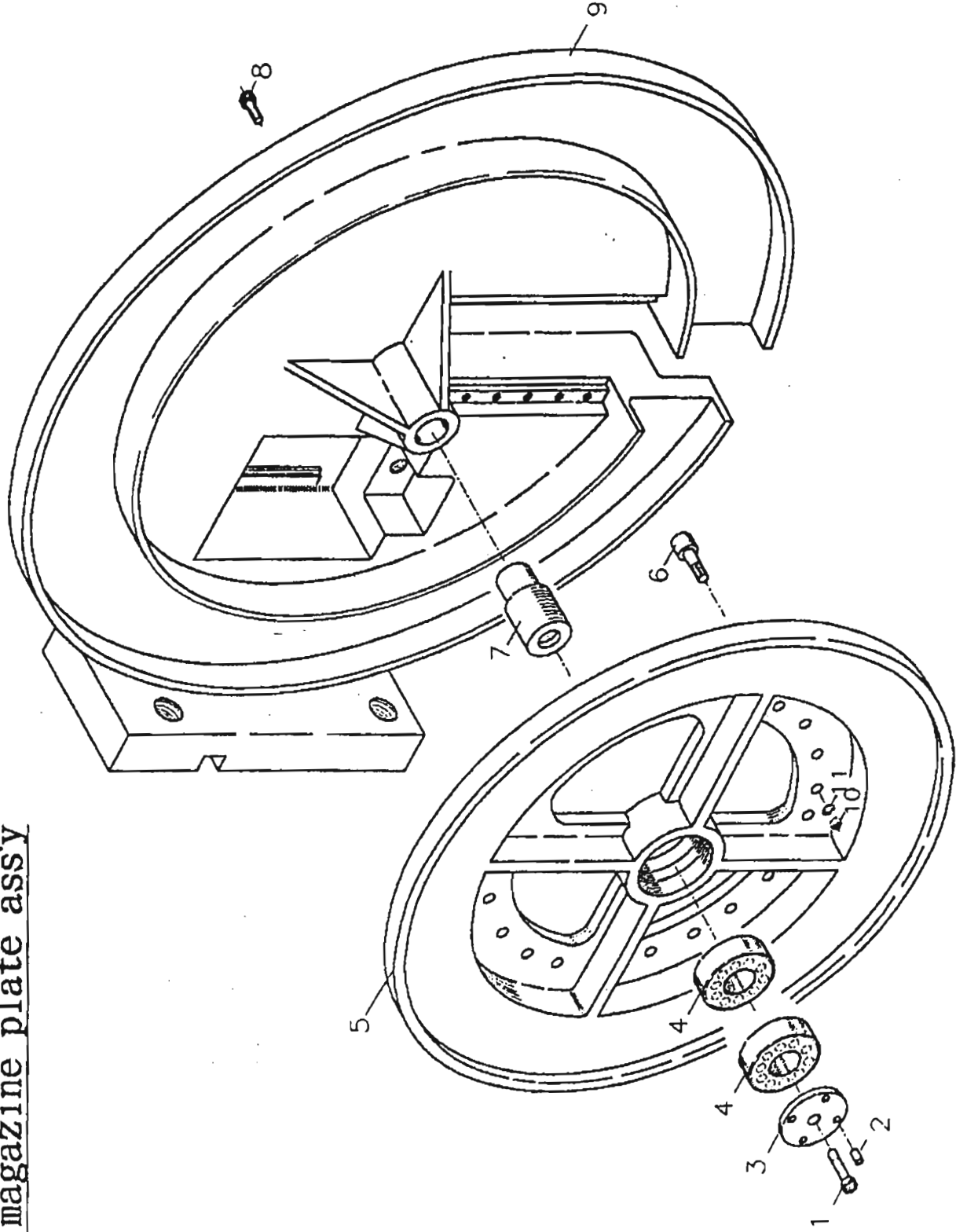
Pot ass'y





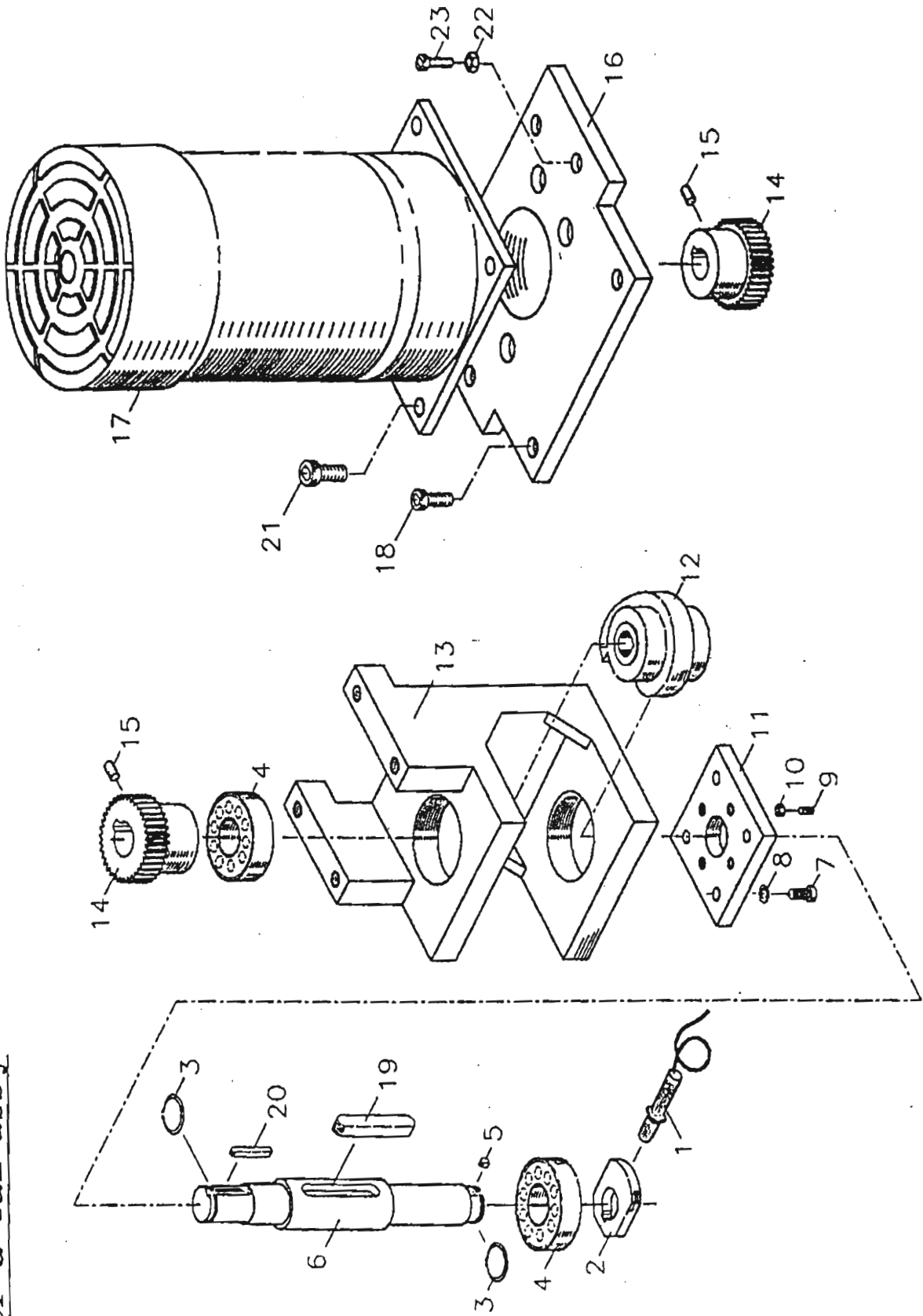


Body & magazine plate ass'y





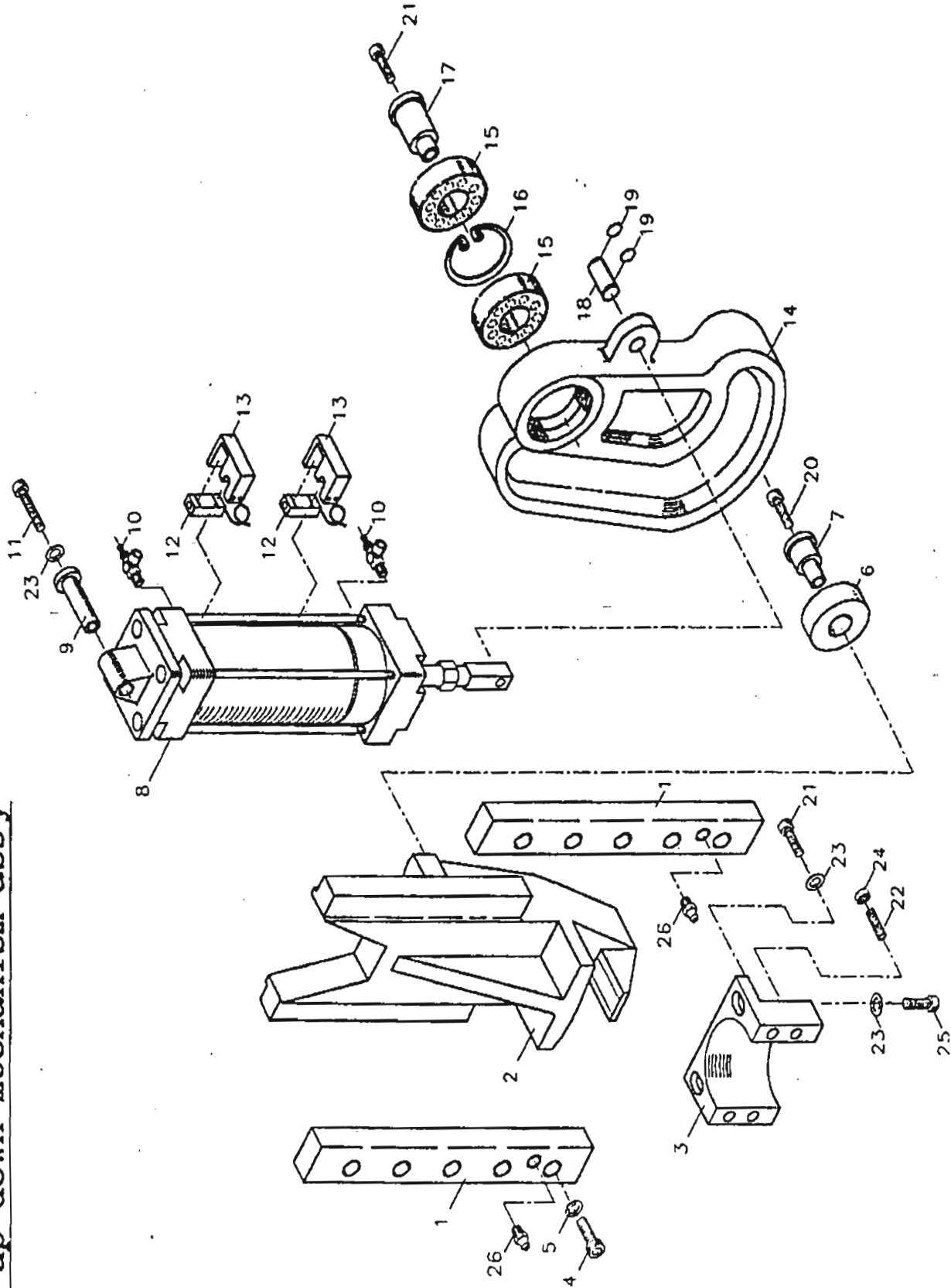
oter & Cam ass'y



# Motor & Cam ass'y part diagram

Item	Part no.	Description	Material / Specification	Quantity	Remark
1	Commercial Products	Proximity Sensor	M12	1	
2	MB-4019	Sensing Device	Powder Metallurgy	1	
3	Commercial Products	U-Clip	S18	2	
4	Commercial Products	Bearing	30204JR	2	
5	Commercial Products	Square Key	5×5×6L	1	
6	MB-4016	Shaft	S45C	1	
7	Commercial Products	CAP	M6×20L	4	
8	Commercial Products	Washer	M6	4	
9	Commercial Products	Fixing Bolt	M6×20L	4	
10	Commercial Products	Screw	M6	4	
11	MB-4018	Adjusting Plate	S45C	1	
12	MB-4017	Cam	SCM435	1	
13	MB-4015	Cam Housing	FCD55	1	
14	MB-4013	Gear 36T	S45C	2	
15	Commercial Products	Fixing Bolt	M8×8L(M6×10L)	2	
16	MB-4014	Motor Support	SS41	1	
17	Commercial Products	Motor	3P,220V,1/4HP,1/20	1	
18	Commercial Products	CAP	M8×25L	4	
19	Commercial Products	Square Key	8×8×45L	1	
20	Commercial Products	Square Key	5×5×30L	1	
21	Commercial Products	CAP	M8×16L	4	
22	Commercial Products	Screw	M8	2	
23	Commercial Products	CAP	M8×30L	2	

# Pot up-down mechanism ass'y

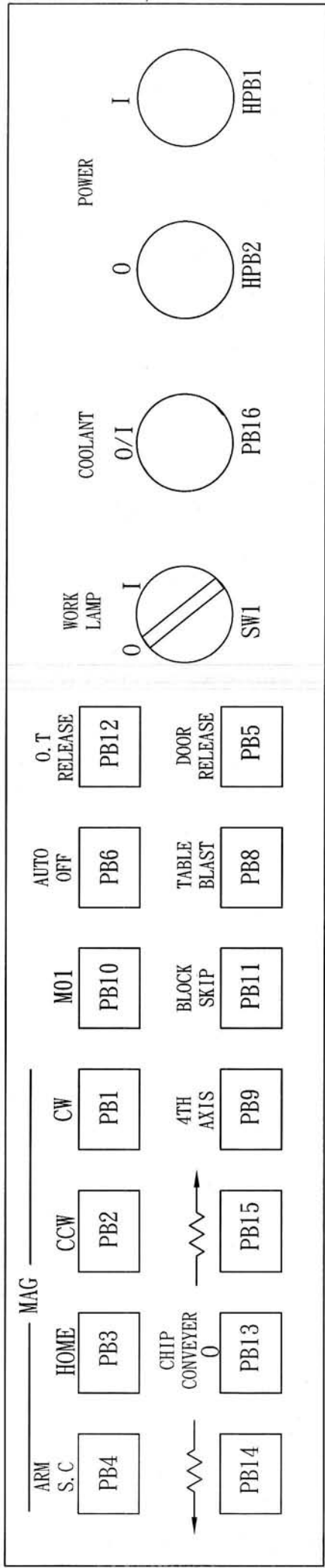


# Pot up-down mechanism ass'y part diagram

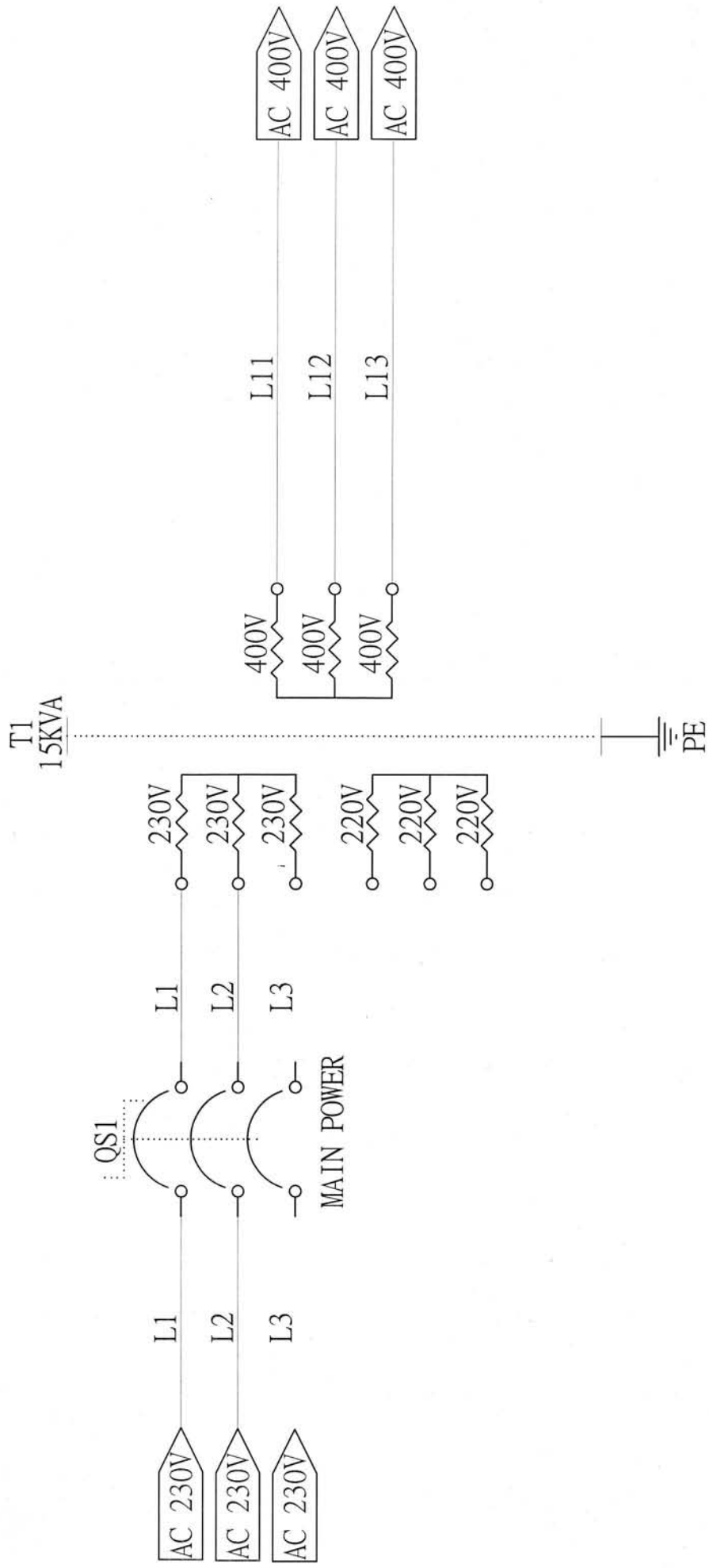
Item	Part no.	Description	Material / Specification	Quantity	Remark
1	MB-4008	Plate	S45C	2	
2	MB-4005	Sprawl	FCD55	1	
3	MB-4007	Housing	FC20	1	
4	Commercial Products	CAP	M6×20L	10	
5	Commercial Products	SW	M6	10	
6	MB-4039	Collar	S45C	1	
7	MB-4006	Sleeve	S45C	1	
8	Commercial Products	Cyliner	CA-φ 50×100L	1	
9	MB-4011	Shaft	S45C	1	
10	Commercial Products	Adjusting Valve	1/4PT× φ 8	1	
11	Commercial Products	CAP	M8×55L	1	
12	Commercial Products	Sensor		2	
13	Commercial Products	Sensor Housing		2	
14	MB-4009	Cam	FCD60	1	
15	Commercial Products	Bearing	6004ZZ	2	
16	Commercial Products	U-Clip	R42	1	
17	MB-4010	Shaft	S45C	1	
18	MB-4012	Adaptor	S45C	1	
19	Commercial Products	Clip	S12	2	
20	Commercial Products	CAP	M6×25L	2	
21	Commercial Products	CAP	M8×40L	2	
22	Commercial Products	Fixing Bolt	M8	2	
23	Commercial Products	SW	M8	5	
24	Commercial Products	Screw	M8	2	
25	Commercial Products	CAP	M8×25L	2	
26	Commercial Products	Nipple grease	1/8PT	2	

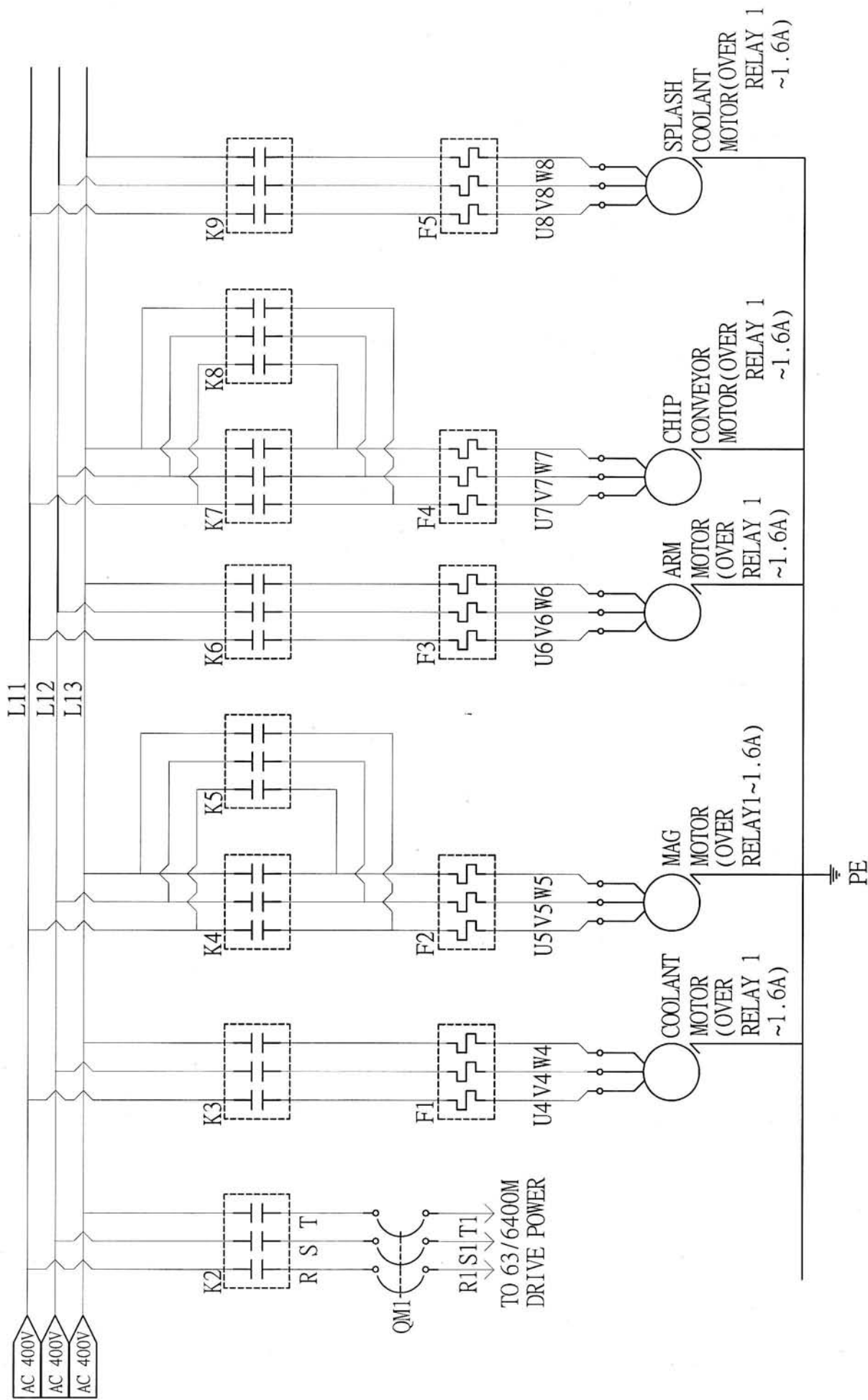
# Electrical Diagram

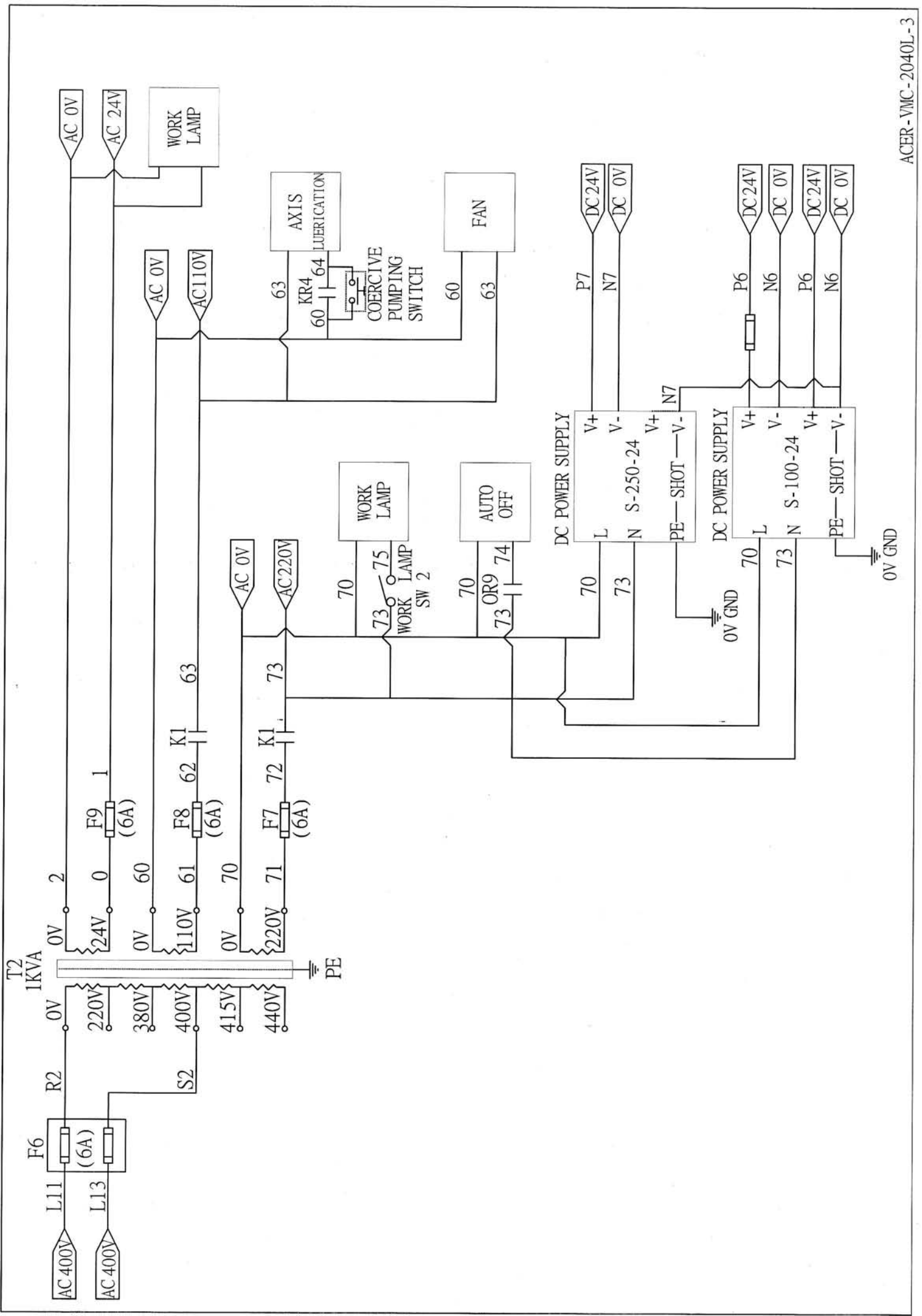


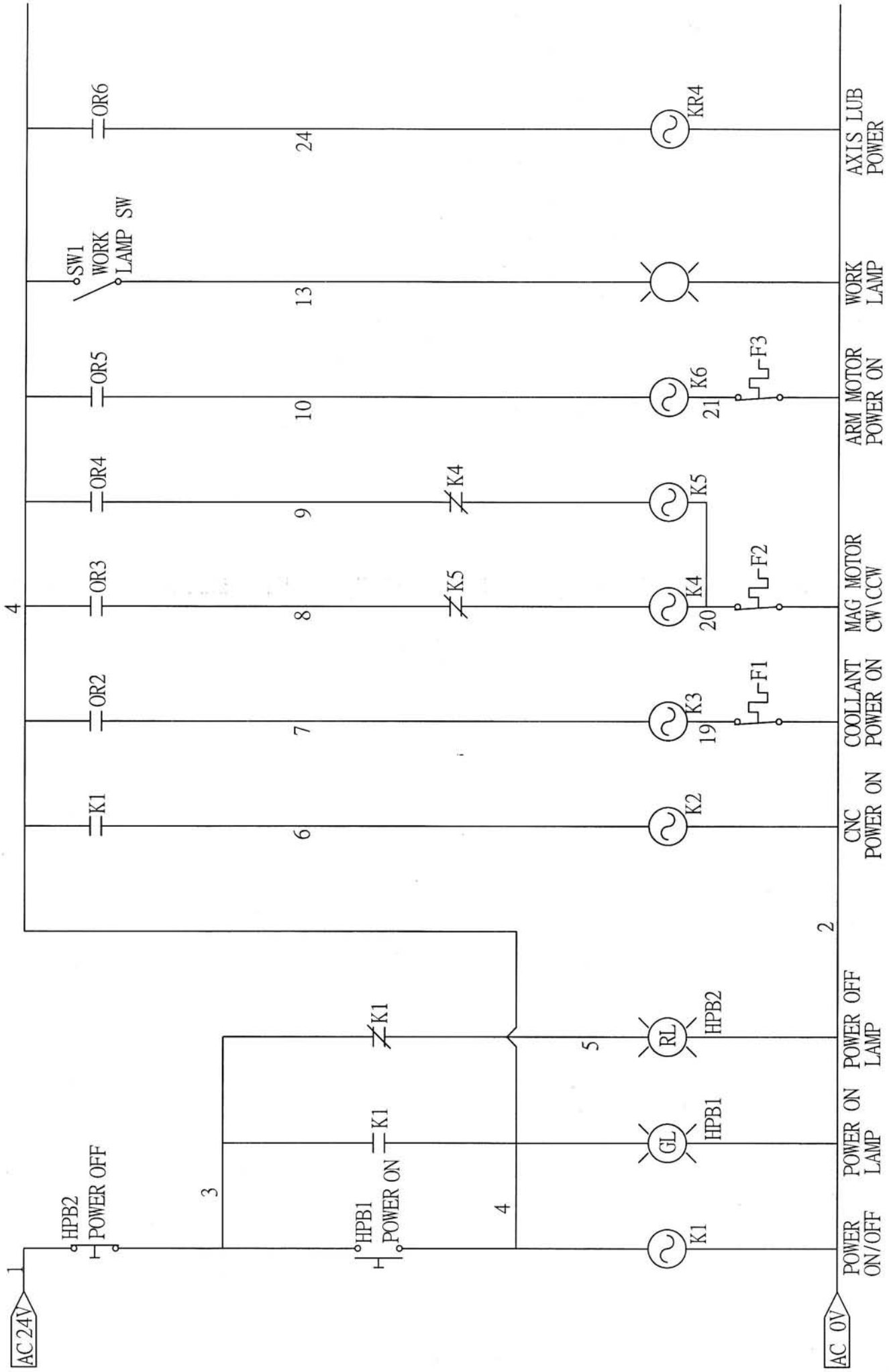


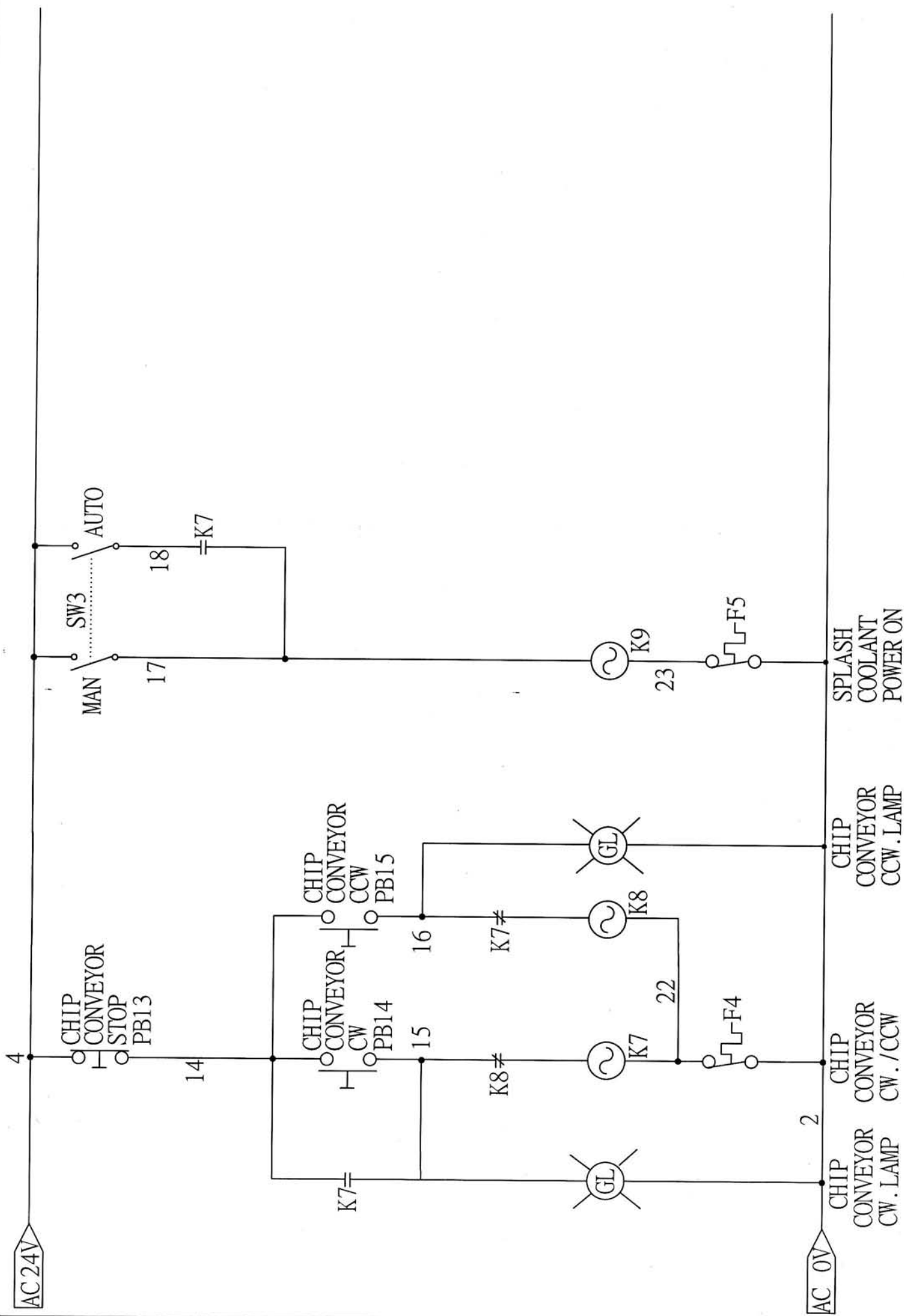
PART POSITION	PART #	DESCRIPTIONS	PART POSITION	PART #	DESCRIPTIONS
POWER 1	MC2040L-HPB 1	POWER ON	PB 6	MC2040L-PB 6	AUTO OFF
POWER 0	MC2040L-HPB 2	POWER OFF	PB 7	MC2040L-PB 7	TOOL UNCLAMP
SW 1	MC2040L-SW 1	WORK LAMP	PB 8	MC2040L-PB 8	TABLE BLAST
SW 2	MC2040L-SW 2	WORK LAMP	PB 9	MC2040L-PB 9	4TH AXIS (OPTION)
SW 3	MC2040L-SW 3	SPLASH COOLANT POWER ON	PB 10	MC2040L-PB 10	M01
SPB 1	MC2040L-SPB 1	EMERGENCY STOP	PB 11	MC2040L-PB 11	BLOCK SKIP
PB 1	MC2040L-PB 1	MAG CW	PB 12	MC2040L-PB 12	O.T. RELEASE
PB 2	MC2040L-PB 2	MAG CCW	PB 13	MC2040L-PB 13	CHIP CONVEYER
PB 3	MC2040L-PB 3	MAG HOME	PB 14	MC2040L-PB 14	↔
PB 4	MC2040L-PB 4	ARM S.C	PB 15	MC2040L-PB 15	↔
PB 5	MC2040L-PB 5	DOOR RELEASE	PB 16	MC2040L-PB 16	COOLANT

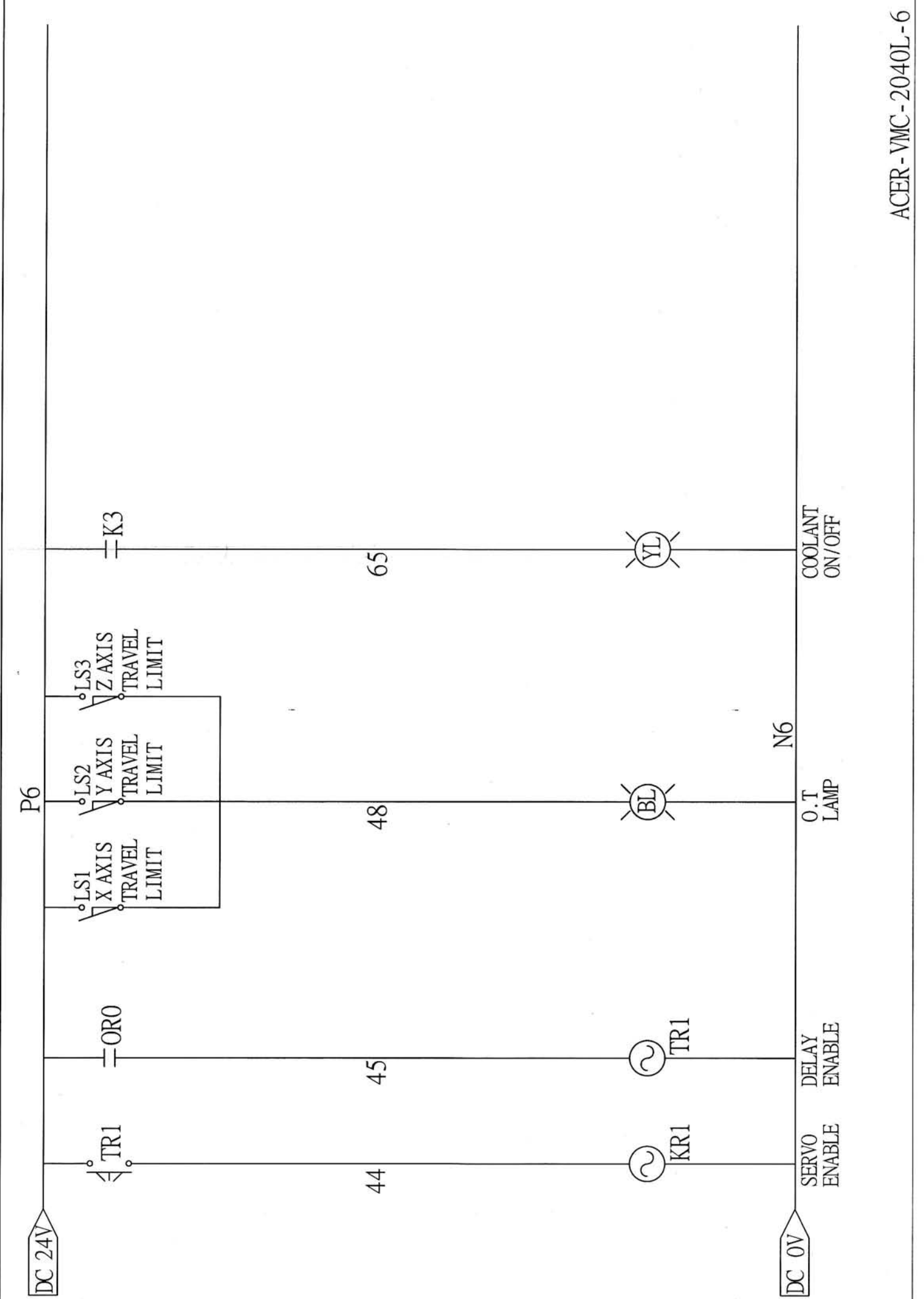




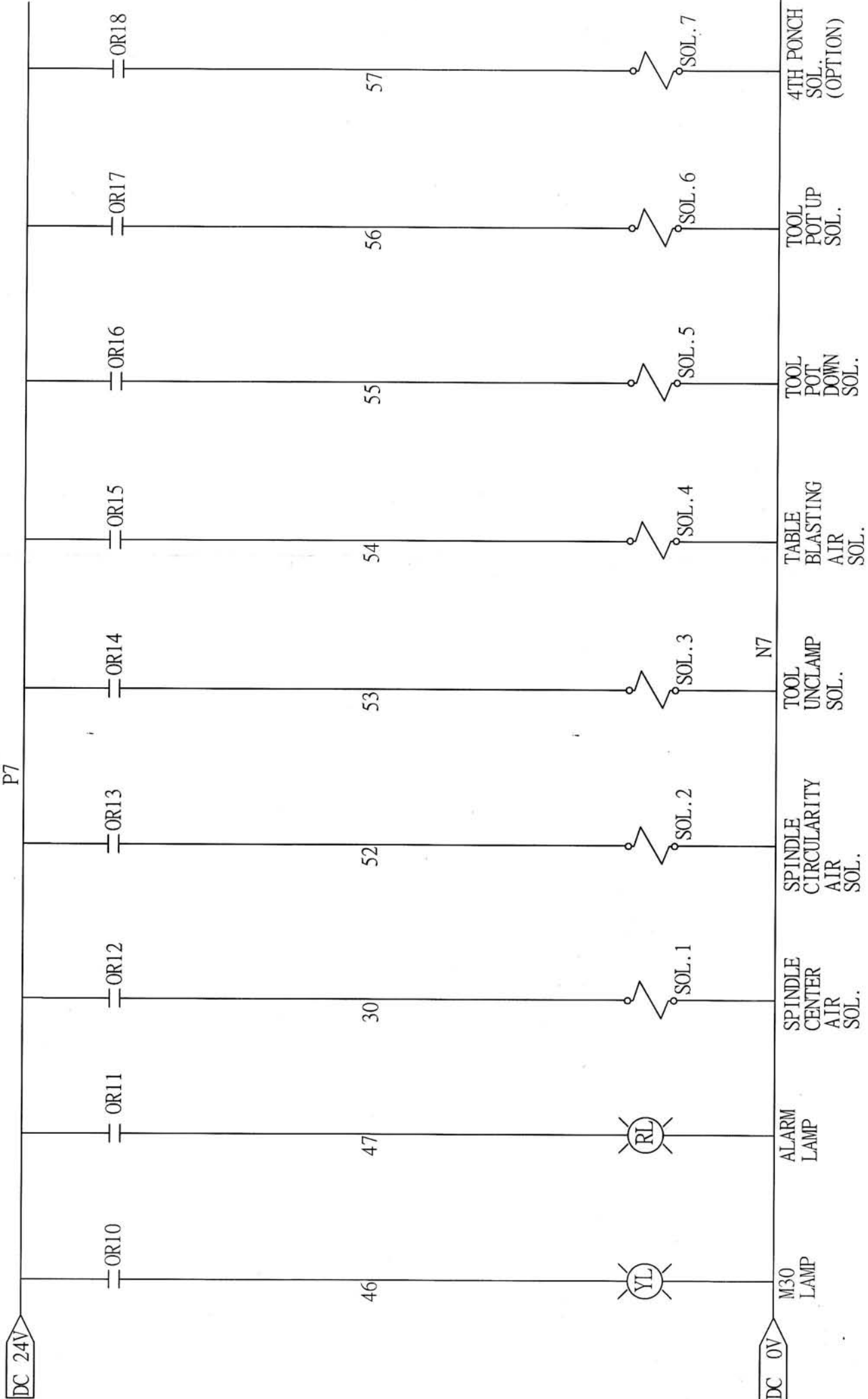






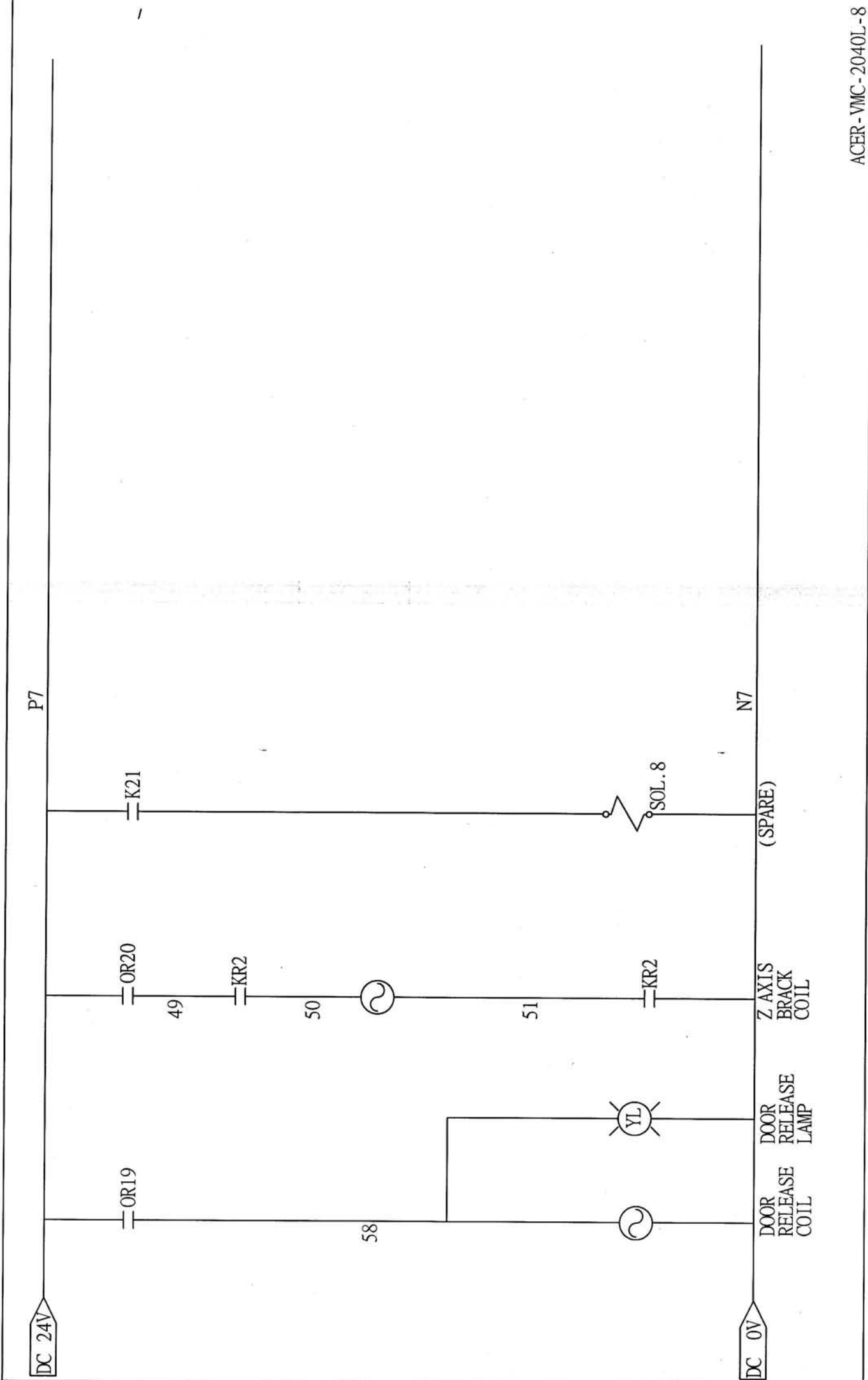


P7

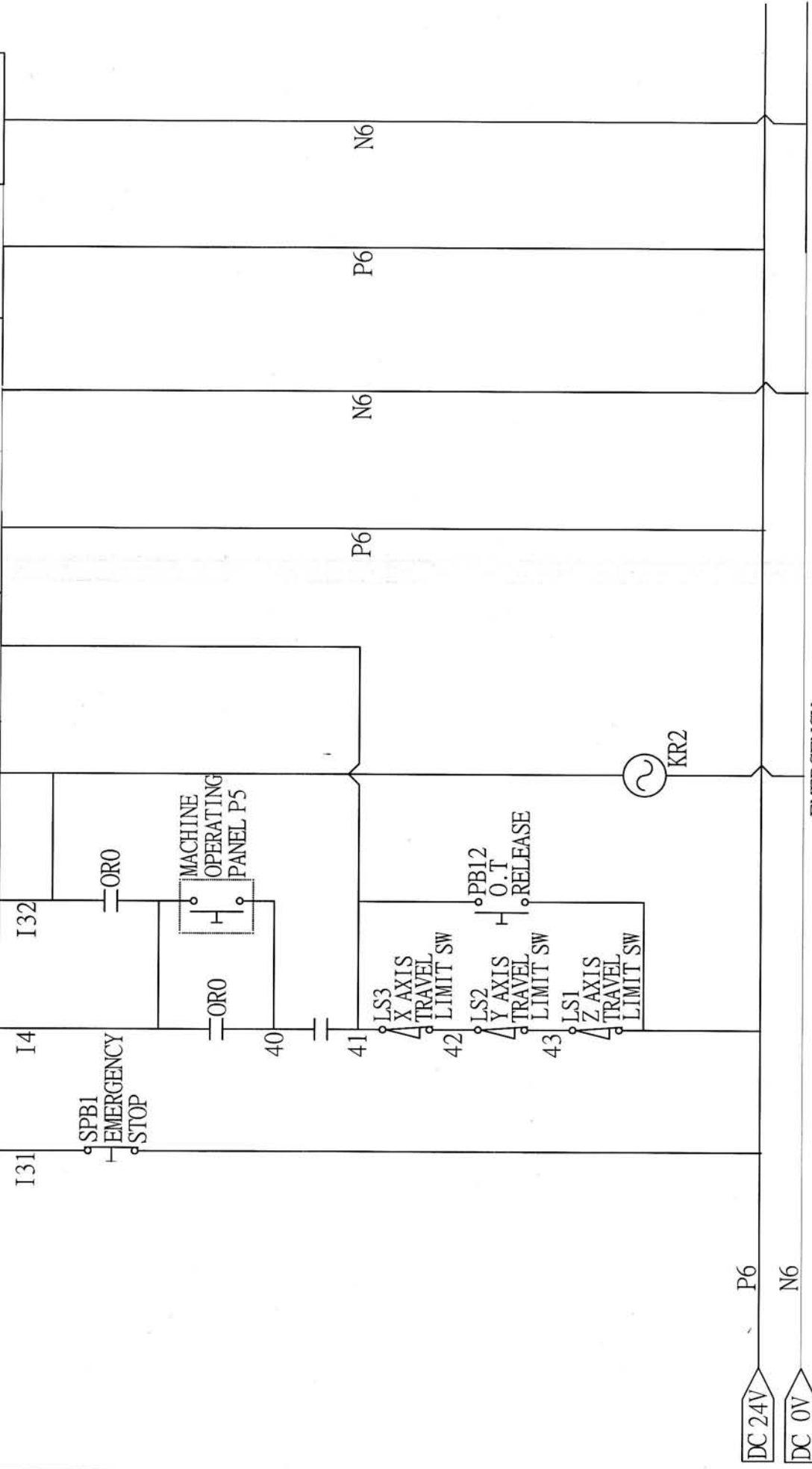


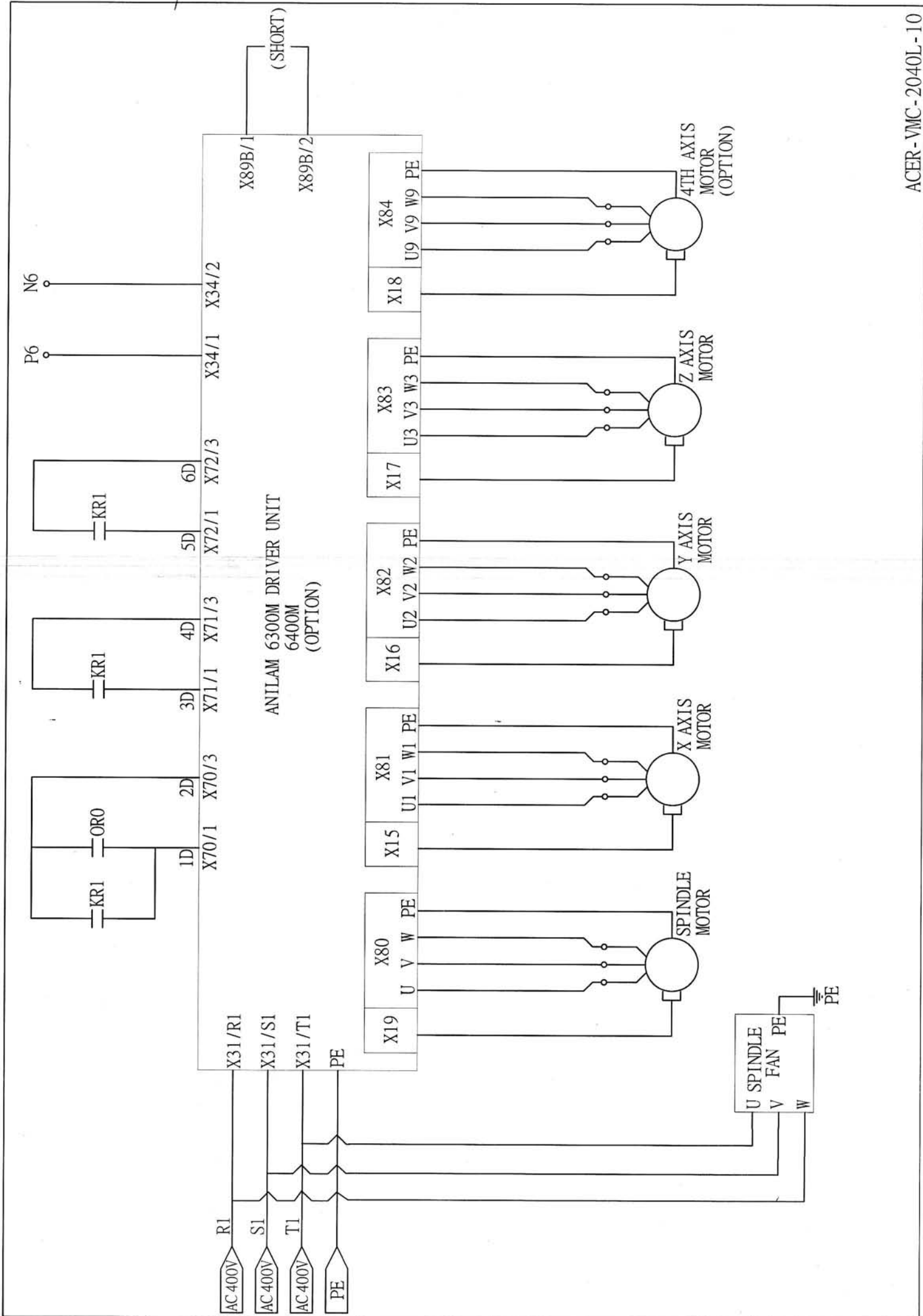
DC 24V	OR10	46	YL	M30 LAMP
OR11	47	RL	ALARM LAMP	
OR12	30	SOL.1	SPINDLE CENTER AIR SOL.	
OR13	52	SOL.2	SPINDLE CIRCULARITY AIR SOL.	
OR14	53	SOL.3	TOOL UNCLAMP SOL.	
OR15	54	SOL.4	TABLE BLASTING AIR SOL.	
OR16	55	SOL.5	TOOL POT DOWN SOL.	
OR17	56	SOL.6	TOOL POT UP SOL.	
OR18	57	SOL.7	4TH PUNCH SOL. (OPTION)	
DC 0V				





PROT INTERFACE	X42 (INPUT PORT)				X44-CONNECTOR	X34-CONNECTOR
	ADDRESS	X0.3	X0.30	X0.30		
CNC PIN NO.	X0.29	X42-5	X42-32	X42-33	X44-3	X34-2





ANILAM  
4TH DRIVER  
25 PIN

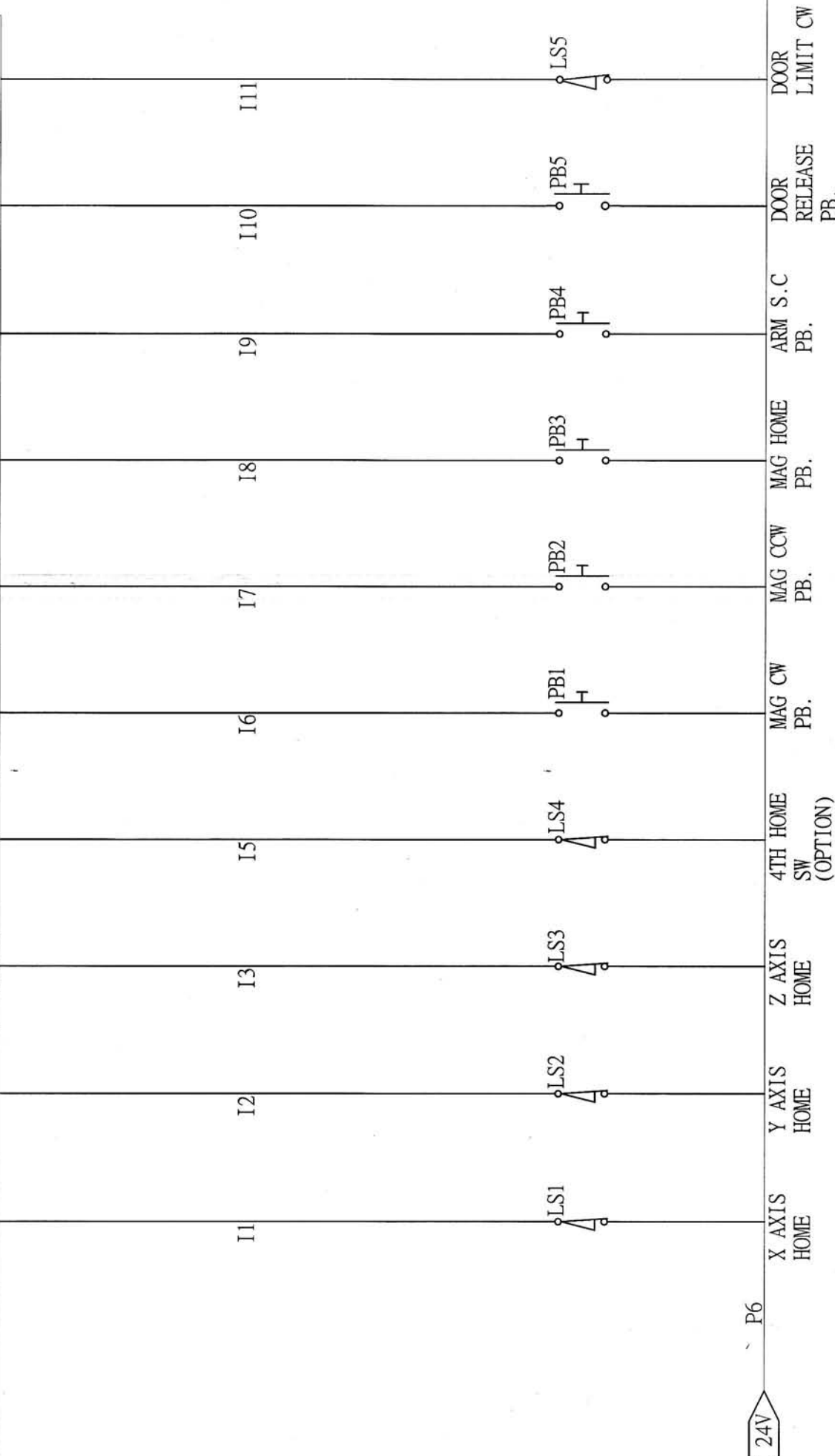
<1>	BROWN/GREEN	<A>
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<4>	YELLOW/BLACK	<D>
<6>	BLUE/BLACK	<E>
<7>	RED/BLACK	<F>
<8>	INTERNAL SHIELD	<G>
<13>	YELLOW	<H>
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<16>	WHITE	<K>
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<25>	PURPLE	<T>
<SHELL>	CHASIS	<R>

MAS-3102A  
22-14S

<G>	<H>	<J>	<K>	<L>	<M>	<A>	<B>	<C>	<R>	<S>	<N>	<P>
<G>	<H>	U9	V9	W9	GED	P6	I22	I23	P6	I5	N7	57
			MOTOR DRIVE				4TH CLAMP	4TH UNCLAMP	4TH HOME		4TH BARKE	SOL.

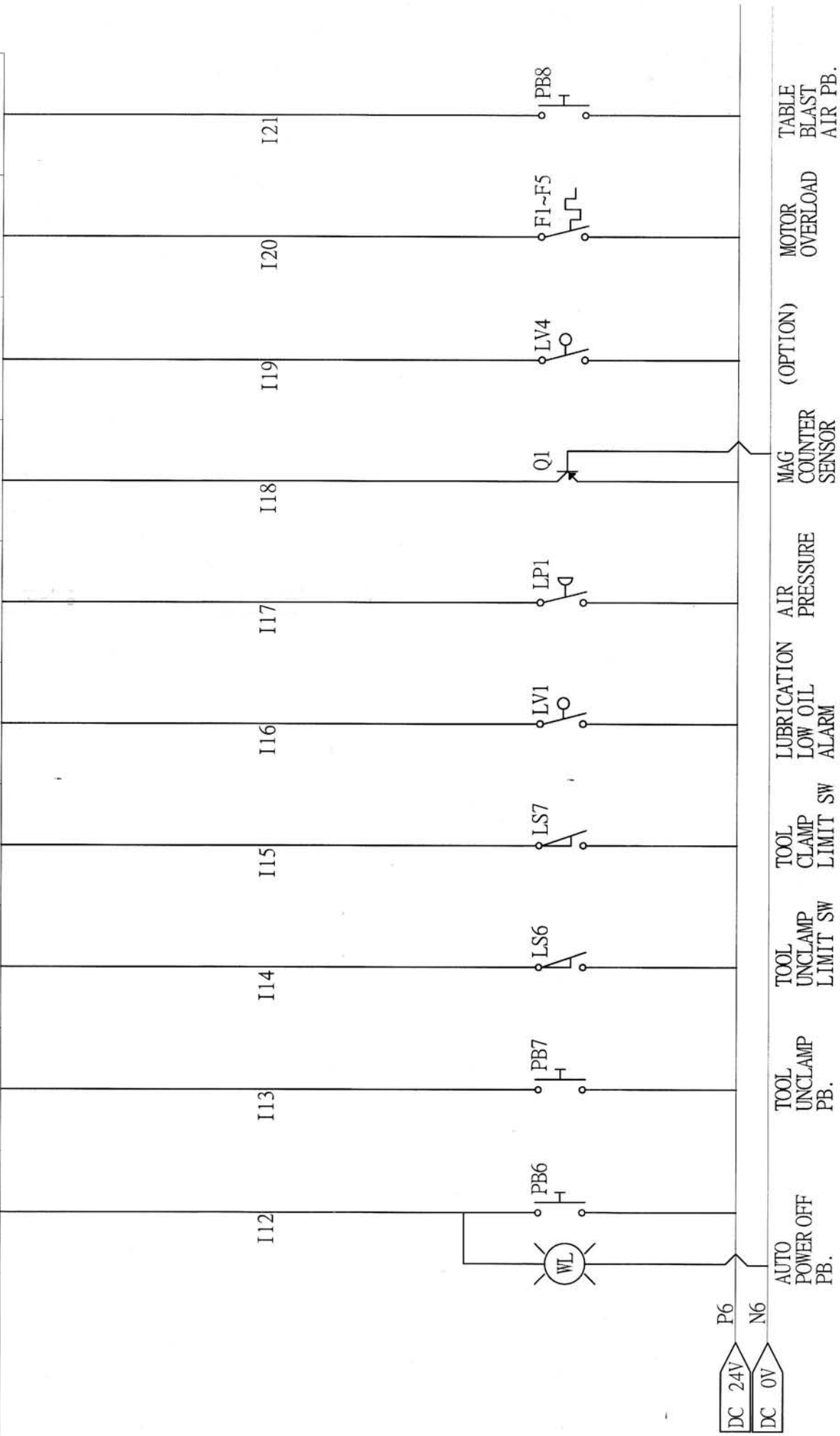
MAS-3102A  
28-11S

X42 (INPUT PORT)				
PORT INTERFACE	ADDRESS	CNC PIN NO.		
X0.0	X0.1	X0.2	X0.4	X0.5
X42-1	X42-2	X42-3	X42-5	X42-6
			X42-7	X42-8
			X42-9	X42-10
			X42-11	



DC 24V P6

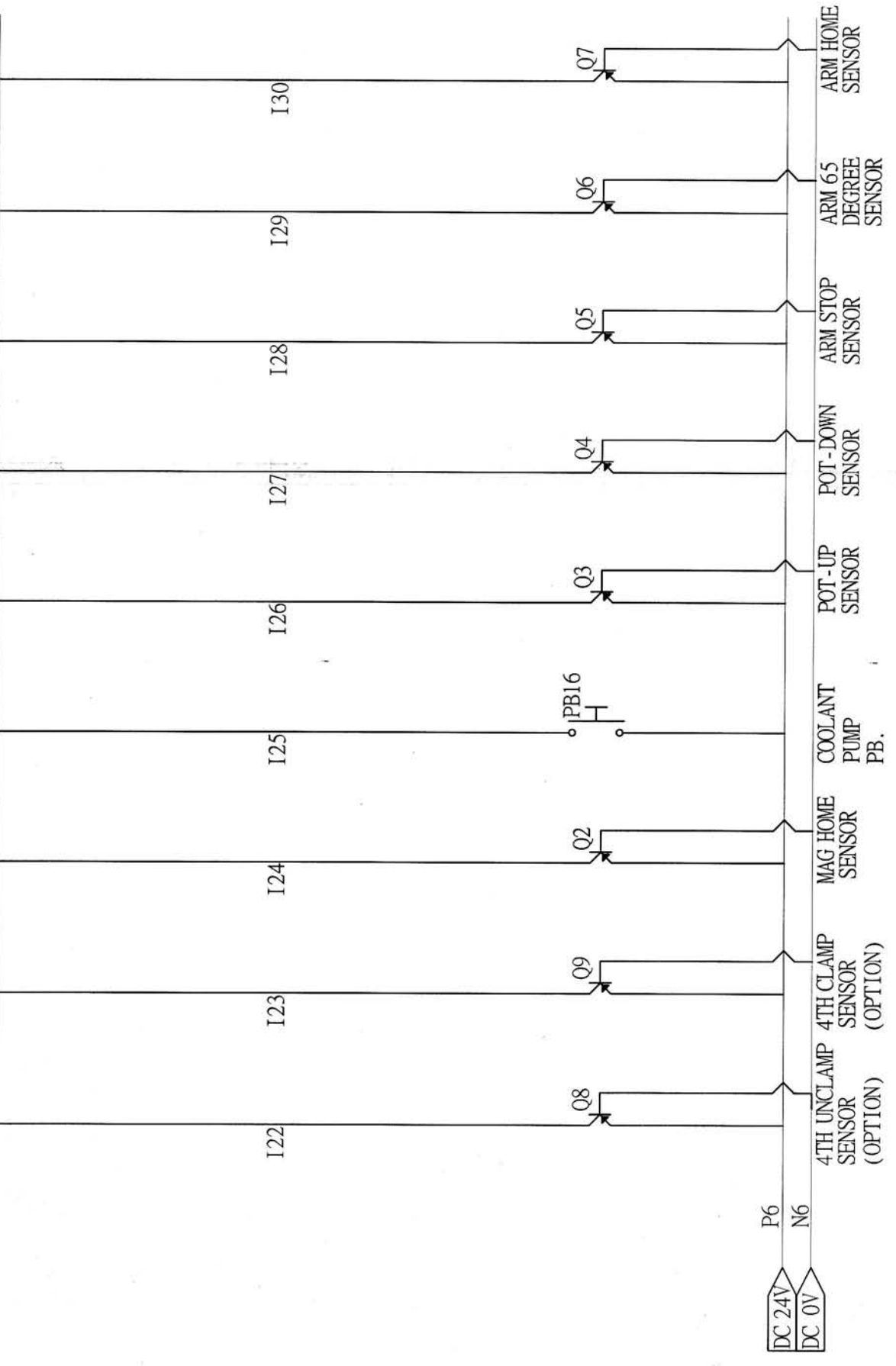
PORT		X42 (INPUT PORT)									
INTERFACE		X0.11	X0.12	X0.13	X0.14	X0.15	X0.16	X0.17	X0.18	X0.19	X0.20
ADDRESS		X42-12	X42-13	X42-14	X42-15	X42-16	X42-17	X42-18	X42-19	X42-20	X42-21
CNC PIN NO.											



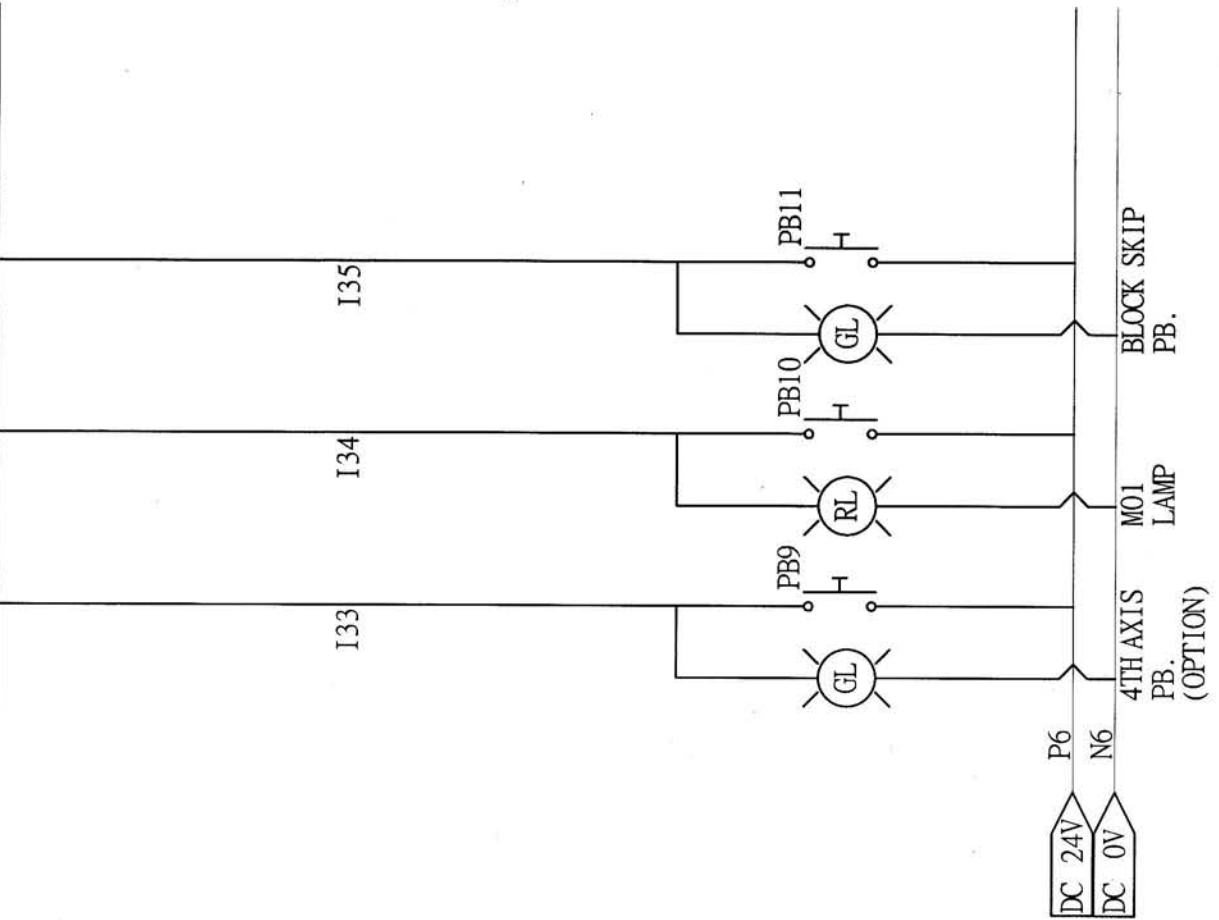
- AUTO POWER OFF PB.
- TOOL UNCLAMP PB.
- TOOL UNCLAMP LIMIT SW
- TOOL CLAMP LIMIT SW
- LUBRICATION LOW OIL ALARM
- AIR PRESSURE
- MAG COUNTER SENSOR
- (OPTION)
- MOTOR OVERLOAD
- TABLE BLAST AIR PB.

DC 24V P6  
DC 0V N6

PORT		X42 (INPUT PORT)								
INTERFACE		X0.21	X0.22	X0.23	X0.24	X0.25	X0.26	X0.27	X0.28	X0.29
ADDRESS		X42-22	X42-23	X42-24	X42-25	X42-26	X42-27	X42-28	X42-29	X42-30
CNC PIN NO.		I22	I23	I24	I25	I26	I27	I28	I29	I30



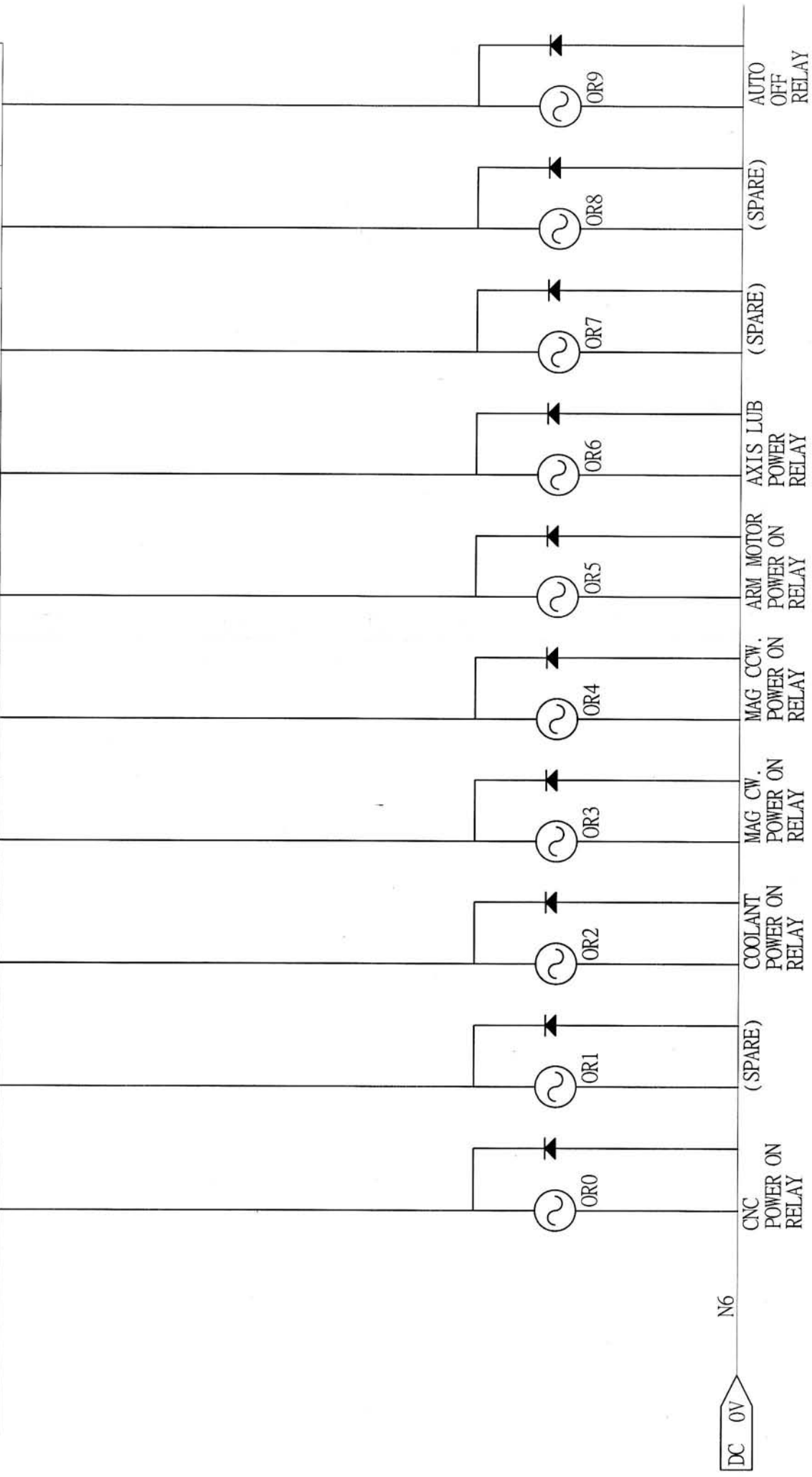
PORT		PLN ( INPUT PORT )	
INTERFACE	ADDRESS	CNC PIN NO.	
	X0.122	P4-3	X0.124
			P4-4
			P4-5



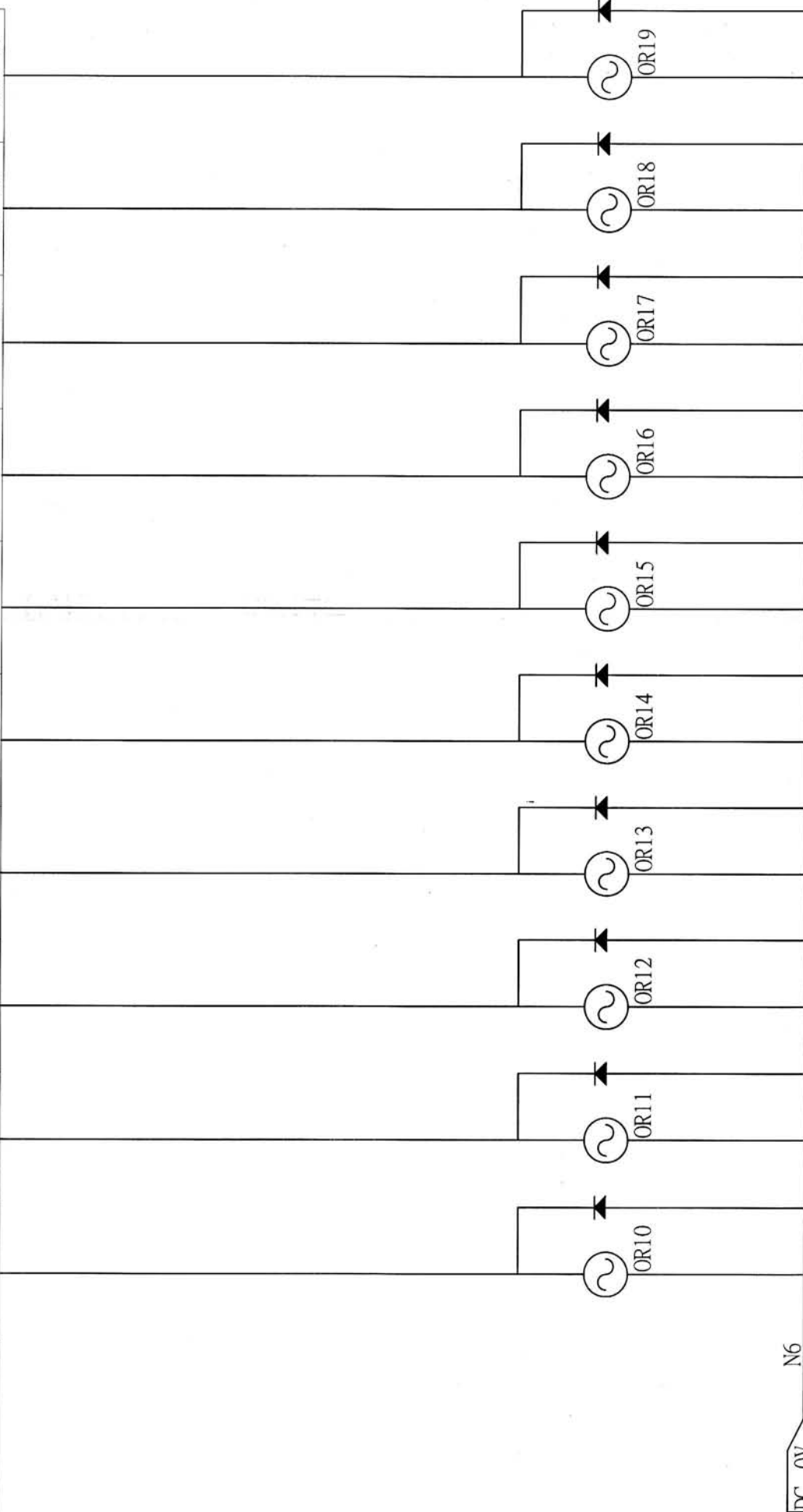


X41 (OUTPUT PORT)

INTERFACE	PORT									
ADDRESS	Y0.0	Y0.1	Y0.2	Y0.3	Y0.4	Y0.5	Y0.6	Y0.7	Y0.8	Y0.9
CNC PIN NO.	X41-9	X41-10	X41-11	X41-12	X41-13	X41-14	X41-15	X41-16	X41-17	X41-18

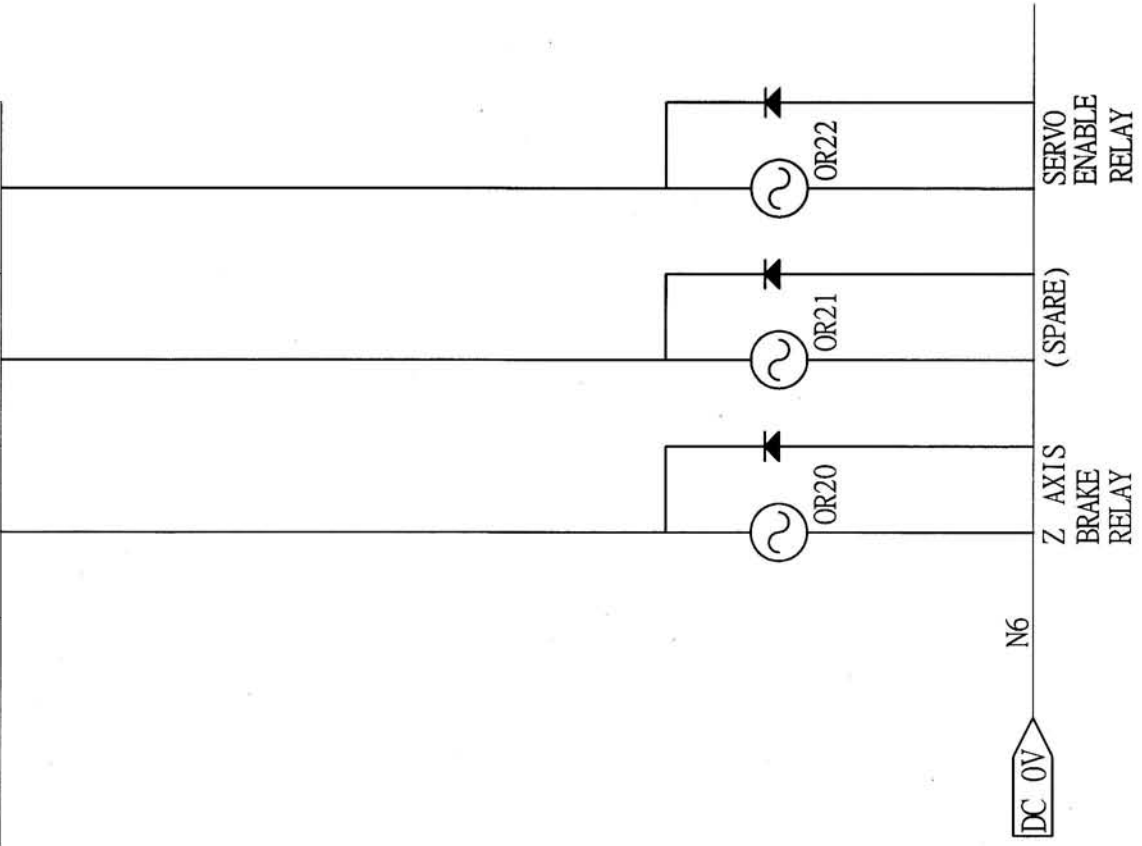


PORT INTERFACE		X41 (OUTPUT PROT)									
ADDRESS		Y0.10	Y0.11	Y0.12	Y0.13	Y0.14	Y0.15	Y0.16	Y0.17	Y0.18	Y0.19
CNC PIN NO.		X41-19	X41-20	X41-21	X41-22	X41-23	X41-24	X41-25	X41-26	X41-27	X41-28



DC 0V N6

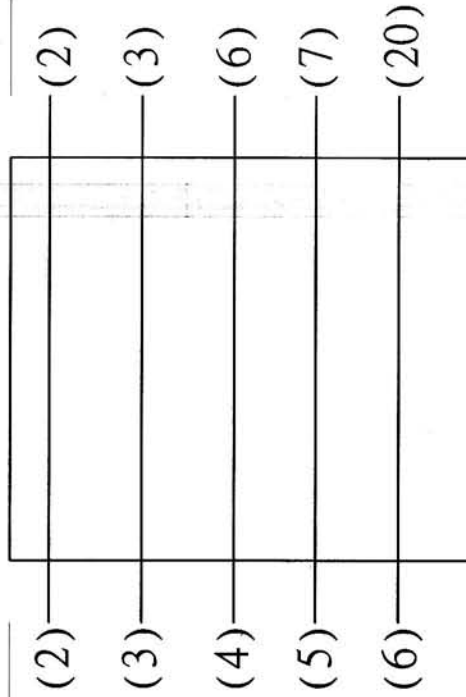
PROT INTERFACE	X41 (OUTPUT PROT)		
ADDRESS	Y0.20	Y0.21	Y0.22
CNC PIN NO.	X40-29	X41-30	X41-31



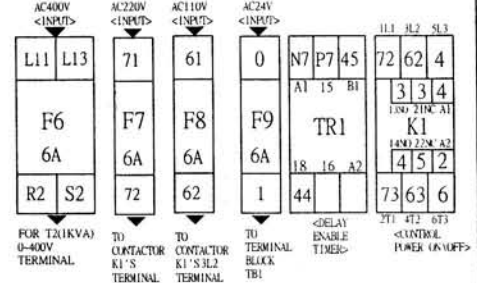
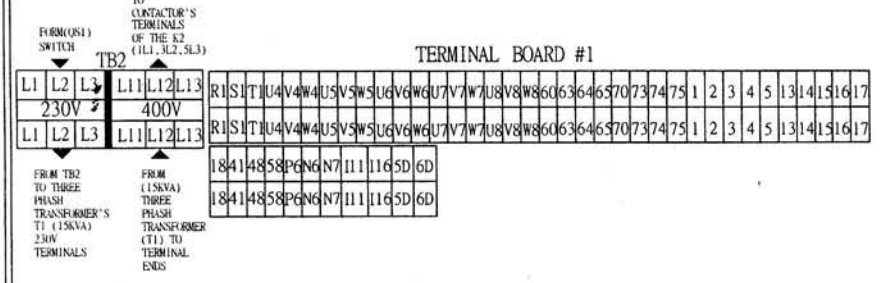
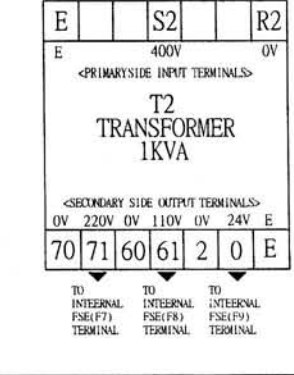
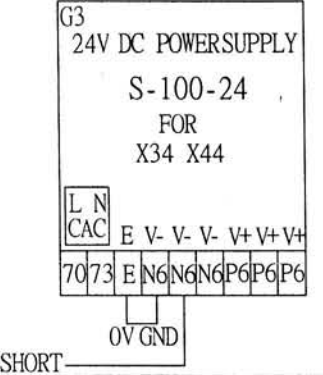
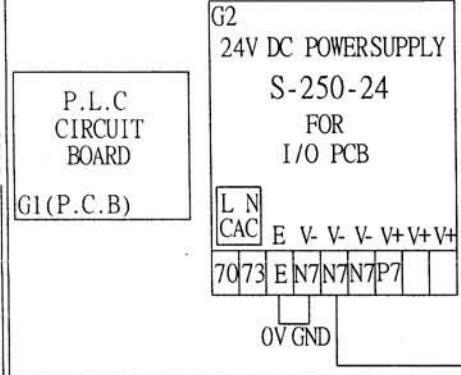
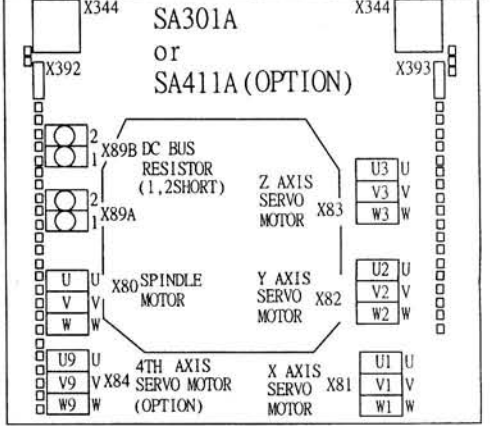
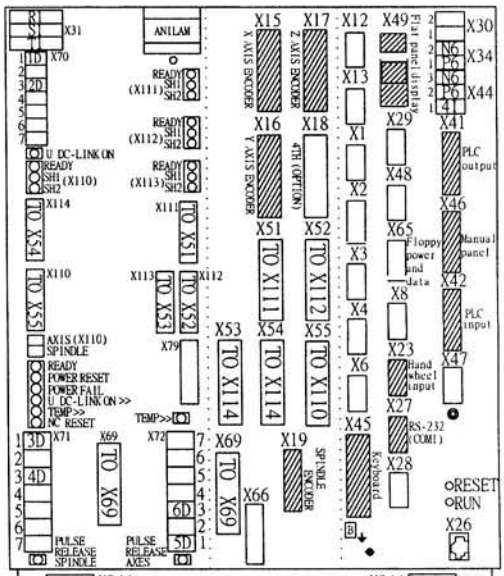
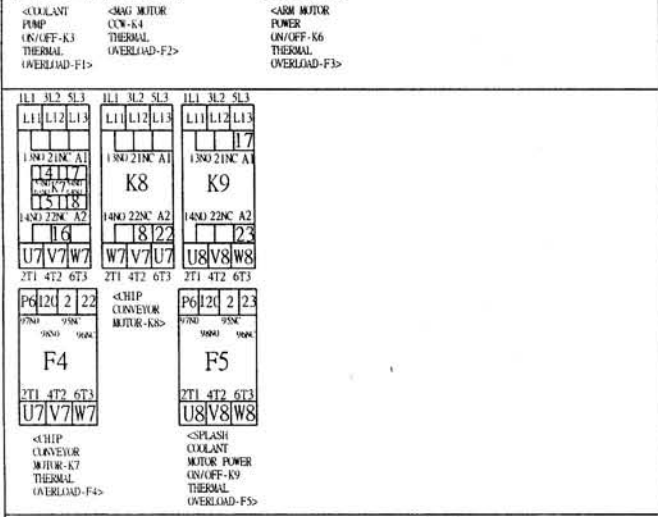
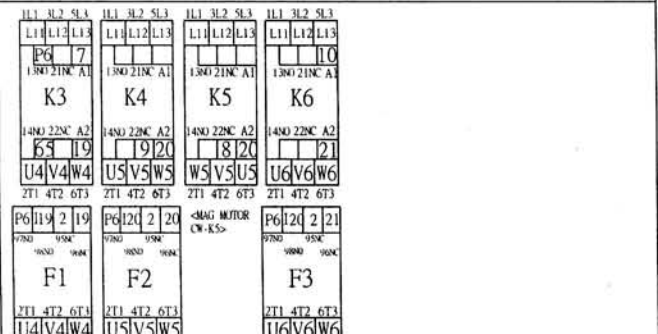
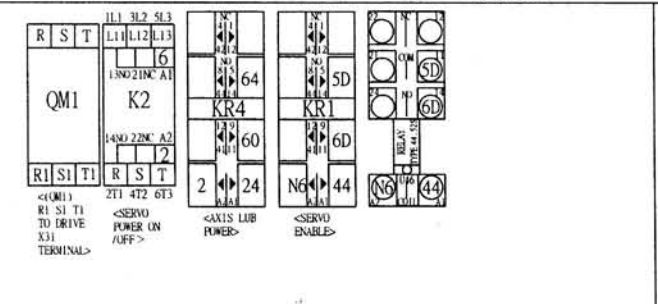
ANILAM  
6300M\6400M

X27 (CNC SIDE)  
9-PIN

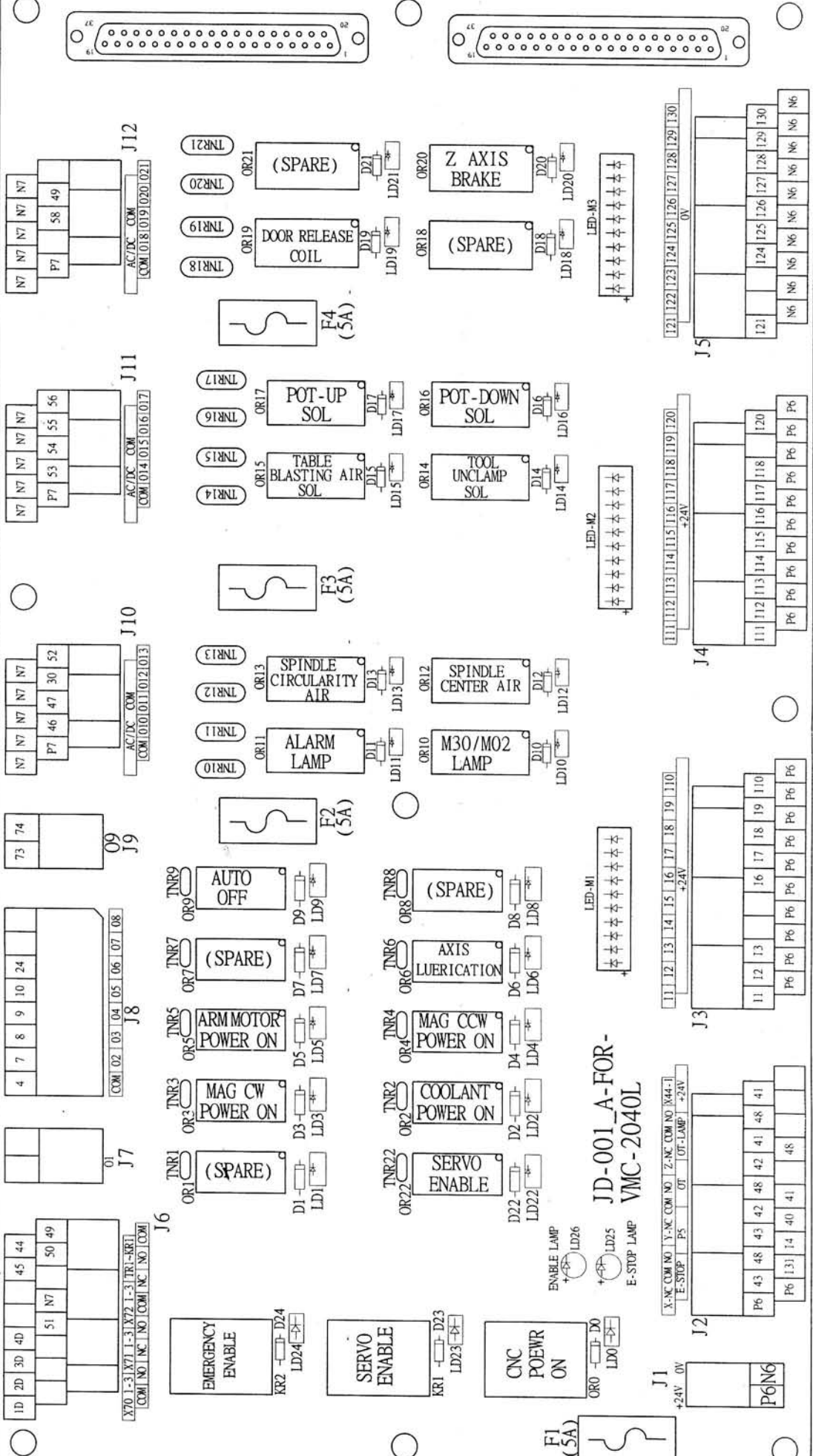
RS-232  
25-PIN



ACER-VMC-2040L-RS-232



TERMINAL BOARD #3 FOR GROUND  
 TERMINAL BOARD #3 FOR GROUND



JD-001\_A-FOR-VMC-2040L