

# SHARP

## ELECTRICAL MANUAL

Machine Type :

Mac

**CD28BA0-A0**

DRAWN	APPROVE	DATE	EDITION	TITLE
陳桂芳	陳家梯	2005.05.13	A0	SV-8045 / 8045A 18i-MB 24T/32T

LONG CHANG MACHINERY CO.,LTD

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**MODIFICATION RECORD**

DATE	PG	ORIGINAL	MODIFIED	ED	REMARK

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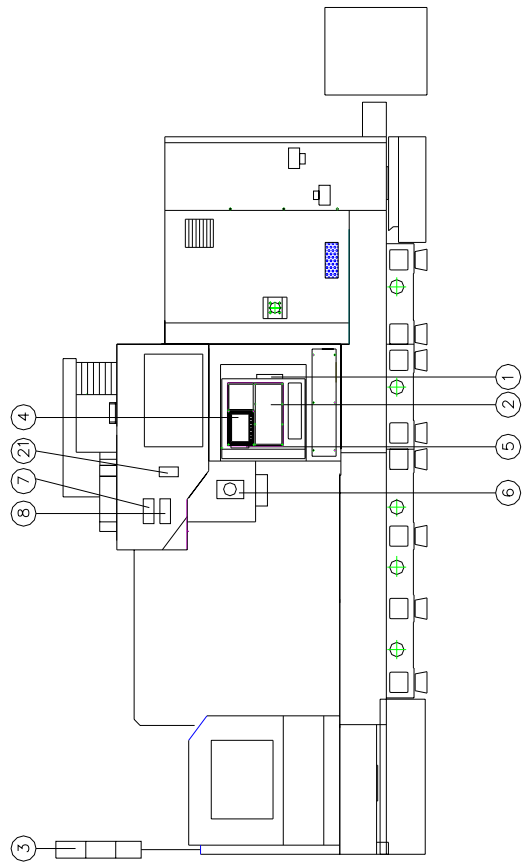
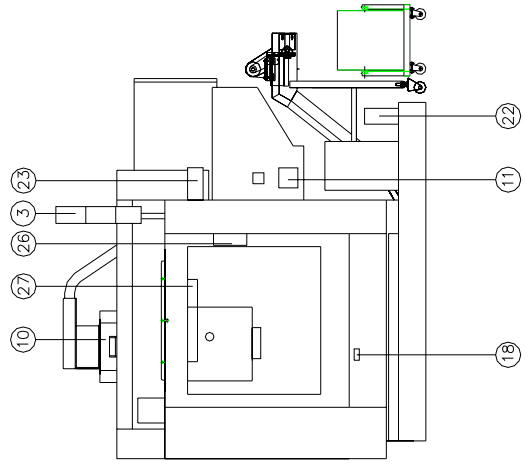
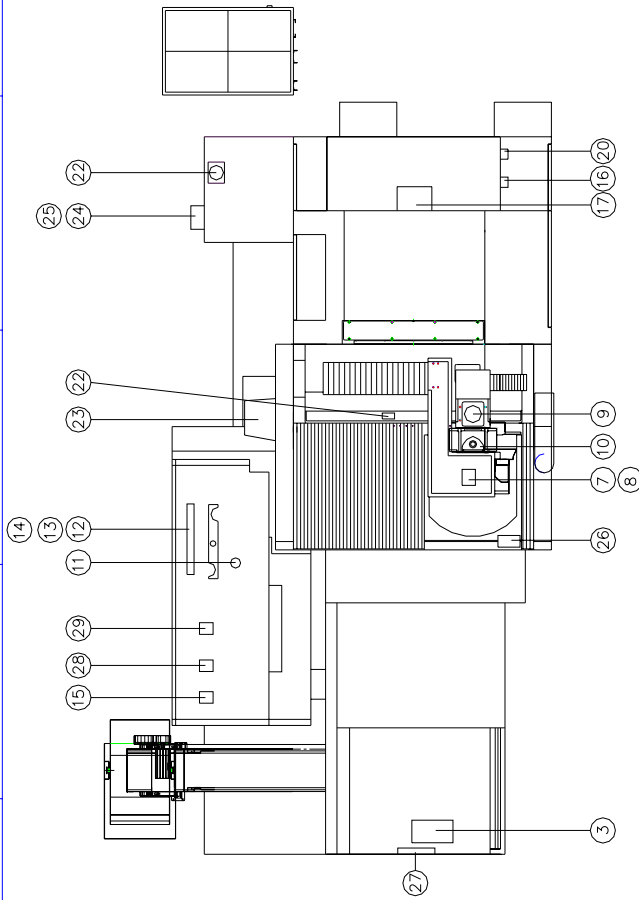
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1. RS232C I/O Port
2. Machine Panel
3. Indication Lamp
4. Display & MDI Unit
5. Power On/Off Panel
6. Manual Tool Clamp/Unclamp Button
7. Limited for Tool Unclamp Position
8. Limited for Tool Clamp Position
9. Z Axis Servo Motor
10. Spindle Motor
11. ATC Motor
12. Sensor for ATC Brake Position
13. Sensor for ATC Clamp Position
14. Sensor for ATC Home Position
15. Sensor for Magazine Original
16. Lubrication Motor
17. X Axis Servo Motor
18. Limited for X Axis Zero Reference & Over Travel
19. Limited for Y Axis Zero Reference & Over Travel
20. Pneumatic Pressure Sensor
21. Limited for Z Axis Zero Reference & Over Travel
22. Coolant Pump
23. Y Axis Servo Motor
24. Sensor for Tank Low Level
25. Sensor for Tank High Level
26. Work Lamp 1
27. Work Lamp 2
28. Sensor for Magazine Counter
29. Magazine Motor



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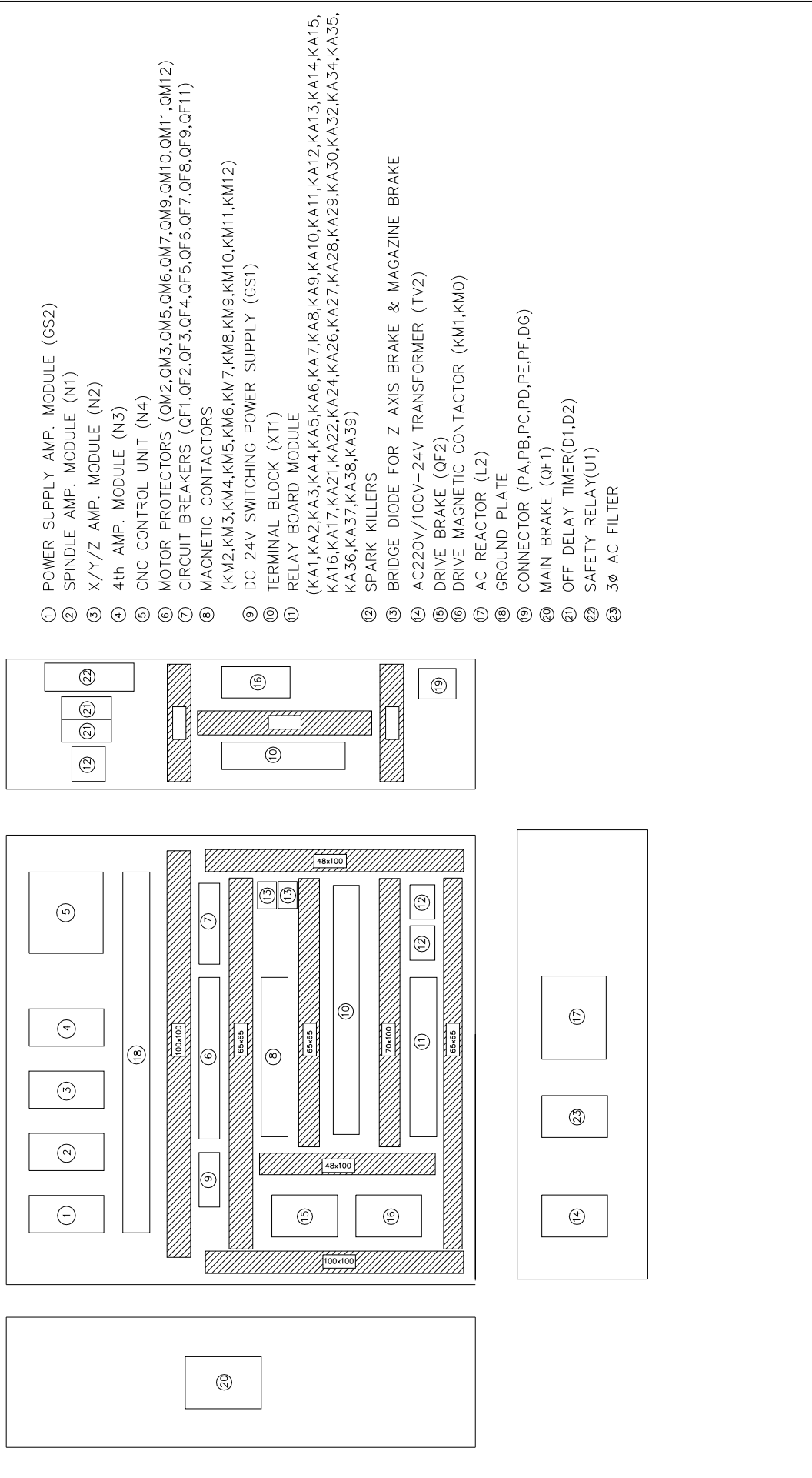
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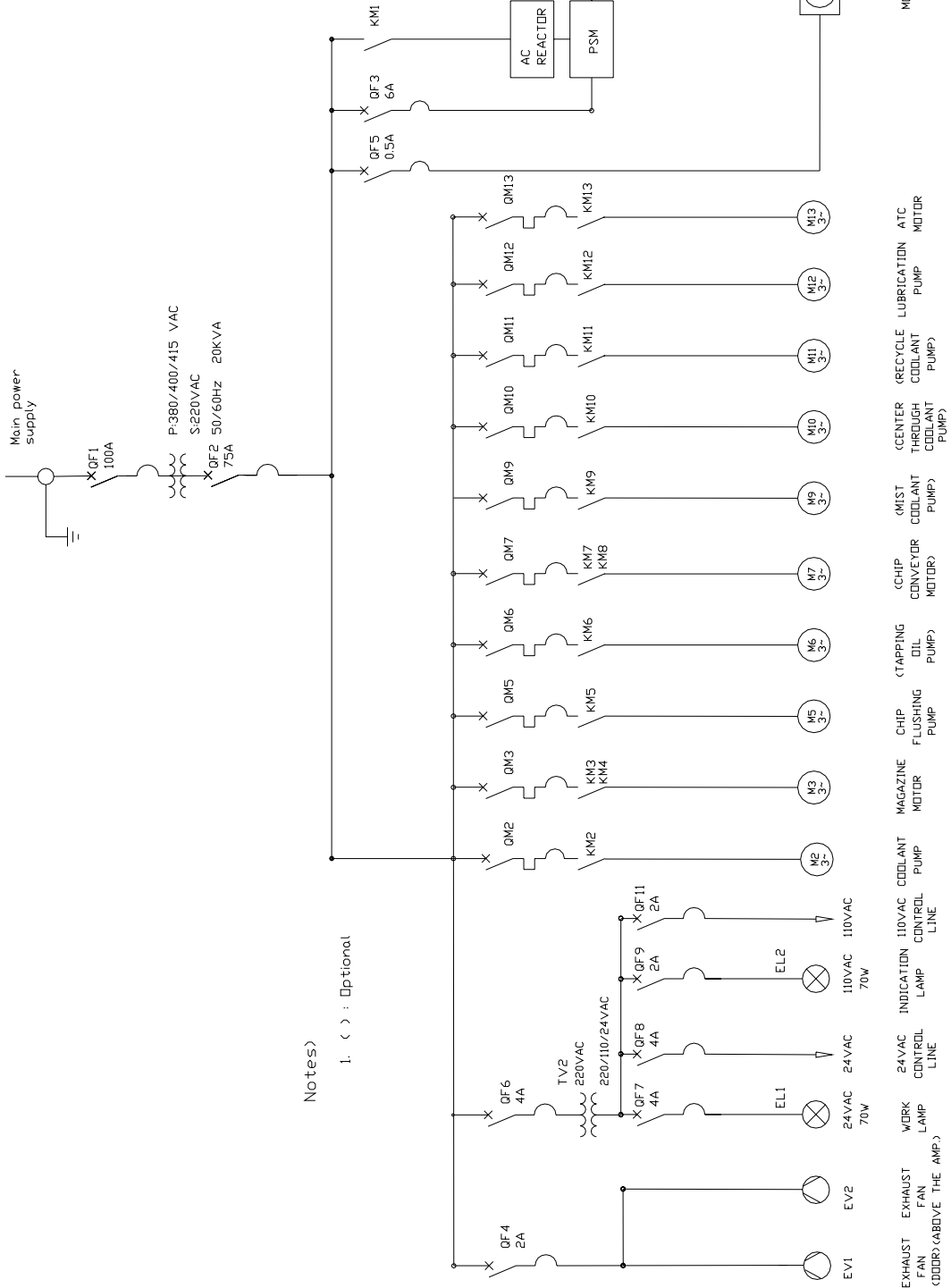
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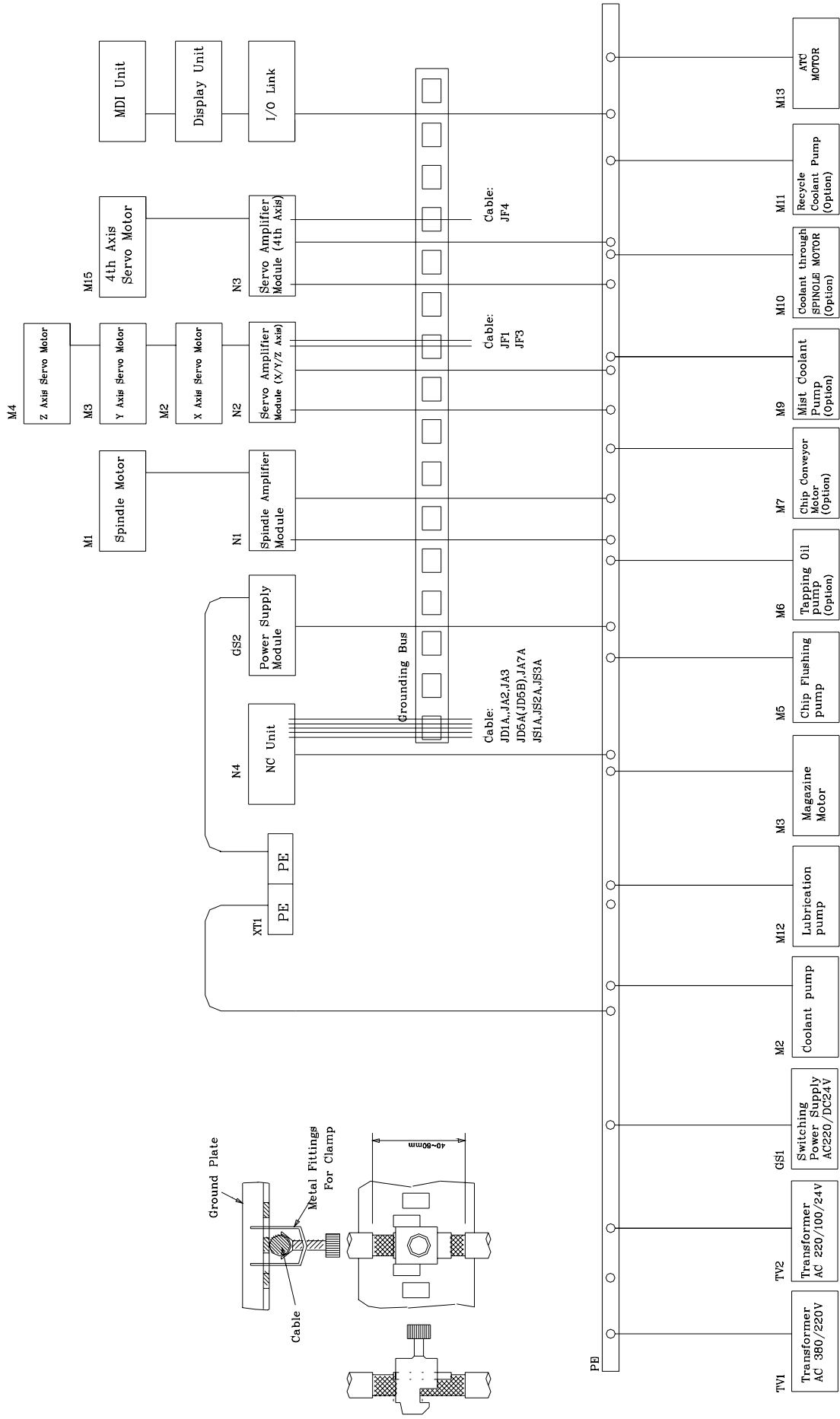
8

OM2	820W	4.0/2.6A	50/60HZ
	370W	1.66/1.58A	50/60HZ
OM3	90W	0.8A	60HZ
OM5	900W	4.2/2.9A	50/60HZ
OM6	550W	2.5/2.4A	50/60HZ
	OPTION		
OM7	190W	0.85A	60HZ
	370W	1.6A	60HZ
OM9	OPTION		
OM10	3kW/4kW	12/15A	50/60HZ
OM11	750W	3.0/2.0A	50/60HZ
OM12	90W	0.63A	60HZ
OM13	400W	1.9A	50/60HZ

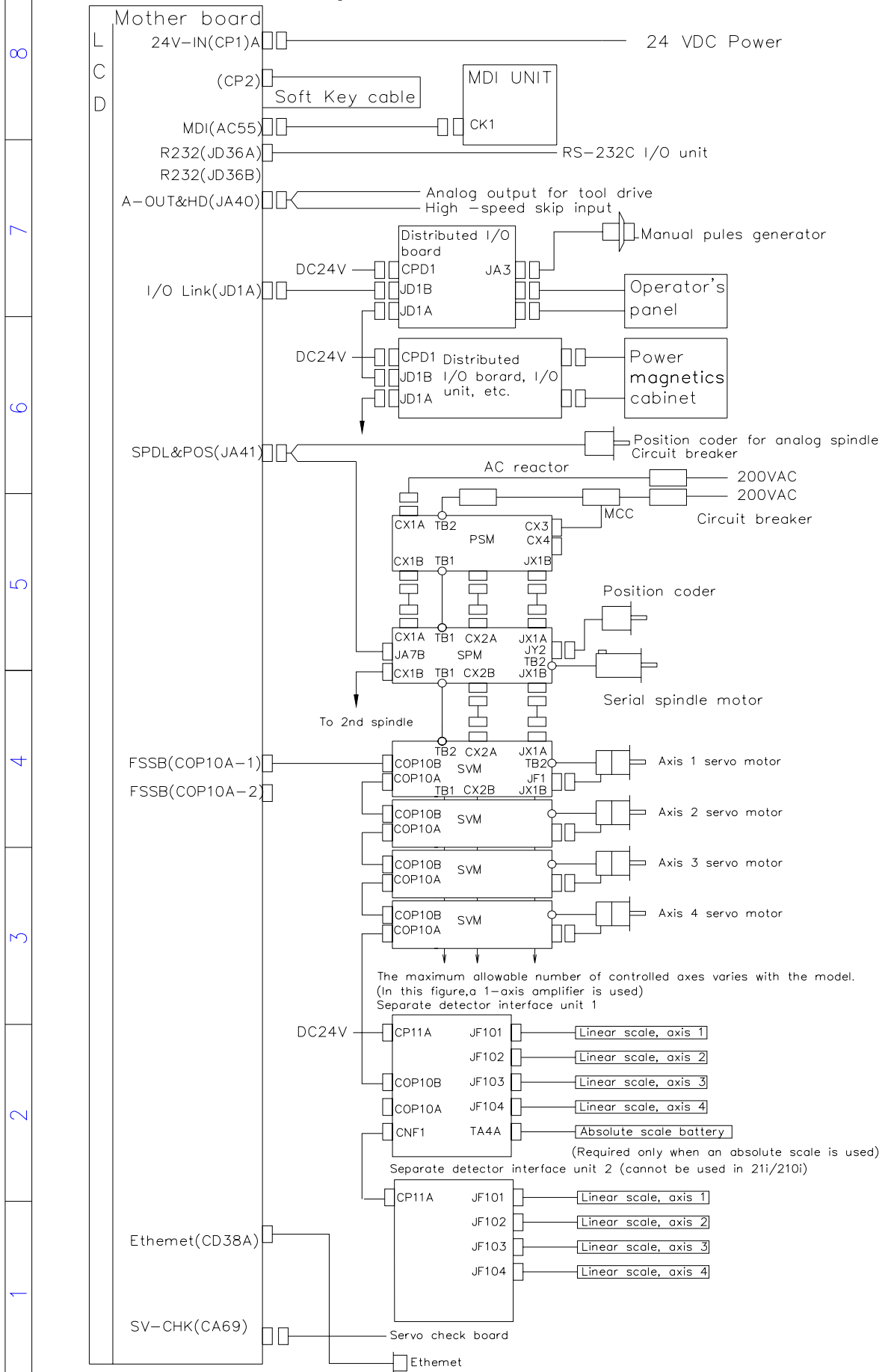


Notes)  
1. ( ) : Optional

1 2 3 4 5 6 7 8









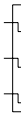


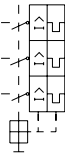








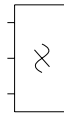

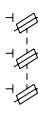



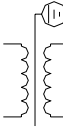
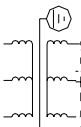
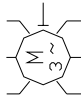


### Total connection diagram for Series 18i-MB



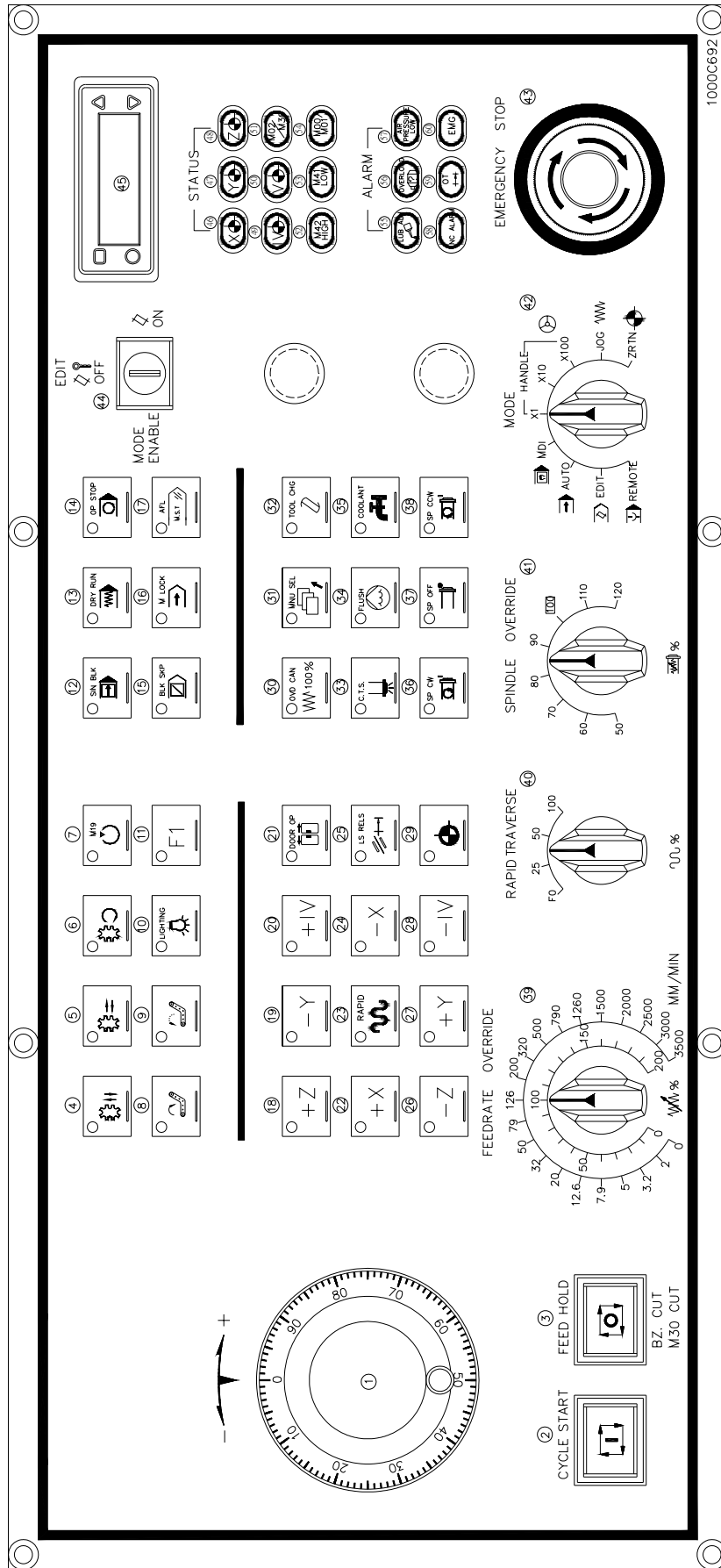
1	2	3	4	5	6	7	8
N.D. power circuit contact			Selector switch with N.C. retained			Position switch 3 position	
N.D. contact			Key-operated switch with N.D.			Position switch 4 position	
N.C. contact			Key-operated switch with N.C.			Position switch 5 position	
N.D. thermal trip			Pressure switch with N.D.			Position switch 6 position	
N.C. thermal trip			Pressure switch with N.C.			Proximity switch N.C. (3-wire)	
Push button N.D. spring return			Foot switch N.D.			Proximity switch N.D. (3-wire)	
Push button with N.C. spring return			Foot switch N.C.			Proximity switch N.D. (2-wire)	
Selector switch with N.D.			E-Stop mushroom pushbutton N.C.			Proximity switch N.C. (2-wire)	



1	2	3	4	5	6	7	8
Limit switch N.C.							Two-pole circuit breaker 
Limit switch N.D.							Three-pole circuit breaker 
Terminal							Three-pole thermal fuse 
Socket with pin & plug							Motor overload switch 
Diode							Power source 
LED							Power supply 
Signal lamp							AC supply filter 3-phase 
Indication lamp							

1	2	3	4	5	6	7	8
	 <p>Transformer 3-phase</p>						
	 <p>One-phase Transformer</p>						
	 <p>Transformer star connection</p>						
	 <p>Motor</p>						
	 <p>Motor</p>						
	 <p>Motor</p>						

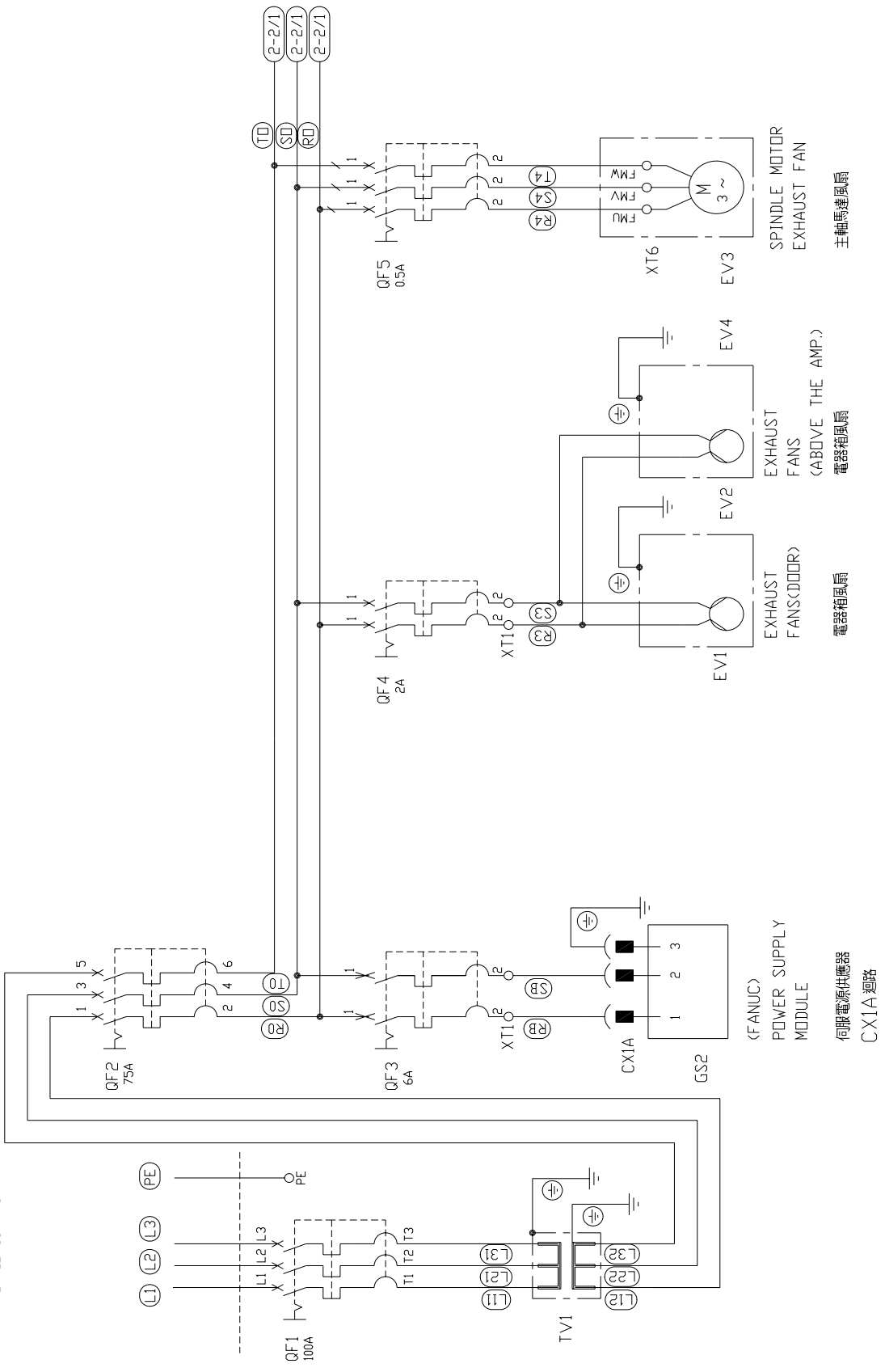
1 2 3 4 5 6 7 8



- |                                   |                                    |                                  |                                 |
|-----------------------------------|------------------------------------|----------------------------------|---------------------------------|
| 1. Manual Pulse Generator         | 25. Limit Switch Remove            | 37. Spindle Stop                 | 49. 4th Axis Zero Position Lamp |
| 2. Cycle Start                    | 26. Manual Feed - Z                | 38. Spindle On Counter Clockwise | 50. 5th Axis Zero Position Lamp |
| 3. Feed Hold                      | 27. Manual Feed + Y                | 39. Feedrate Override            | 51. Program Finish Lamp         |
| 4. Tool Magazine Up/Down          | 28. Manual Feed - IV               | 40. Rapid Traverse               | 52. Low Gear Lamp               |
| 5. Tool Magazine Forward/Backward | 29. Auto Zero Return               | 41. Spindle Override             | 53. High Gear Lamp              |
| 6. Tool Magazine Turn Clockwise   | 30. Override Cancel                | 42. Mode Select & Mode Enable    | 54. Optional Stop Lamp          |
| 7. Spindle Orientation            | 31. Menu                           | 43. Emergency Stop               | 55. Lubrication Low Level lamp  |
| 8. Chip Conveyor ON/OFF           | 32. Tool Change                    | 44. Program Protect              | 56. Motor Overload Lamp         |
| 9. Chip Conveyor Reverse ON/OFF   | 33. Coolant Through Spindle ON/OFF | 45. Tool NO. Indicator           | 57. Air Pressure Low Level Lamp |
| 10. Work Lamp ON/OFF              | 34. Chip Flush ON/OFF              | 46. X Axis Zero Position Lamp    | 58. NC Alarm Lamp               |
| 11. Spare Function for Option     | 35. Coolant ON/OFF                 | 47. Y Axis Zero Position Lamp    | 59. O.T. Detect Lamp            |
| 12. Single Block                  | 36. Spindle on Clockwise           | 48. Z Axis Zero Position Lamp    | 60. Emergency Stop Lamp         |

1 2 3 4 5 6 7 8

POWER SOURCE  
 PHASE: 3PH L1, L2, L3 +PE  
 MAX. AMPERAGE: 63A (AC)

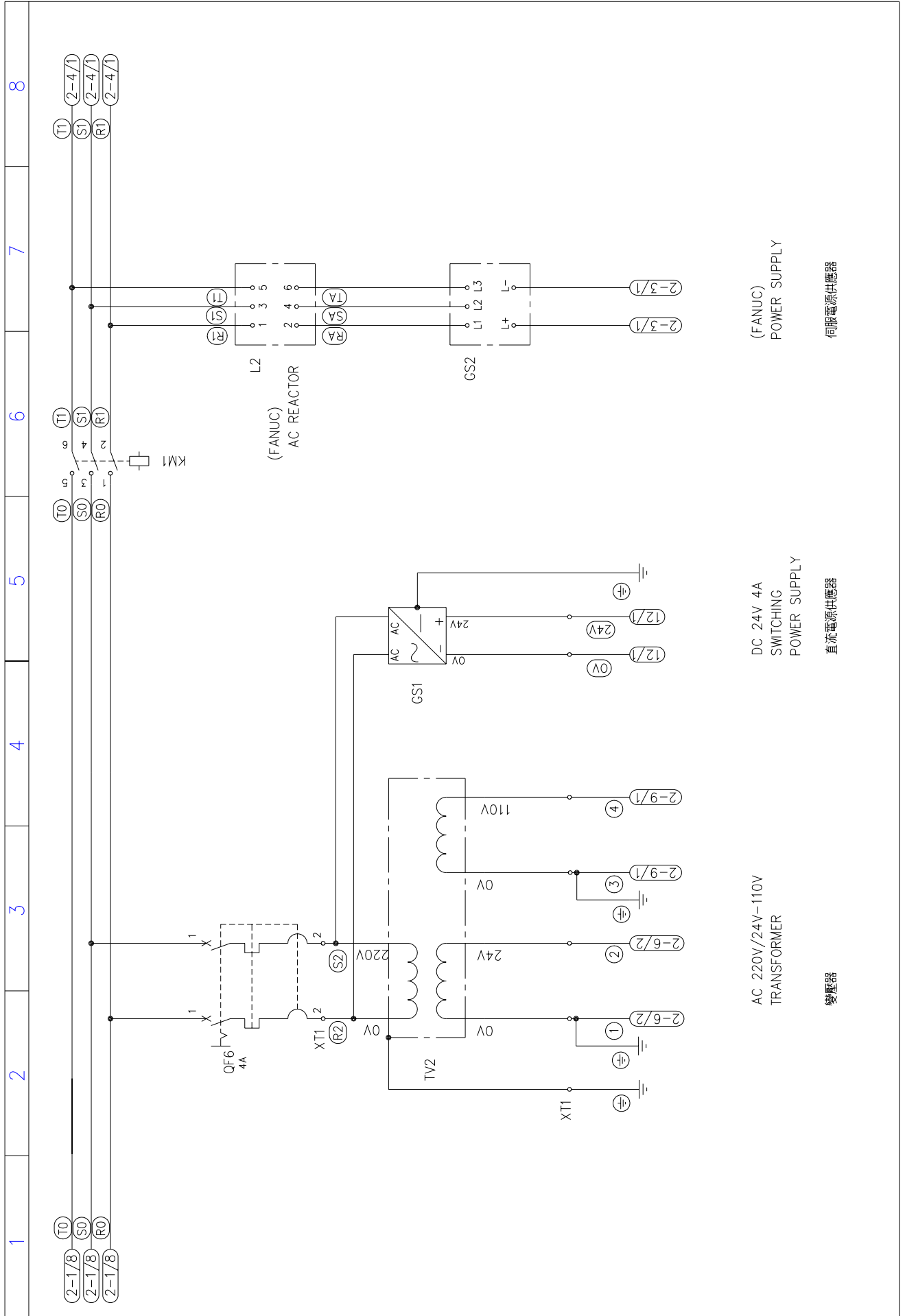


主軸馬達風扇

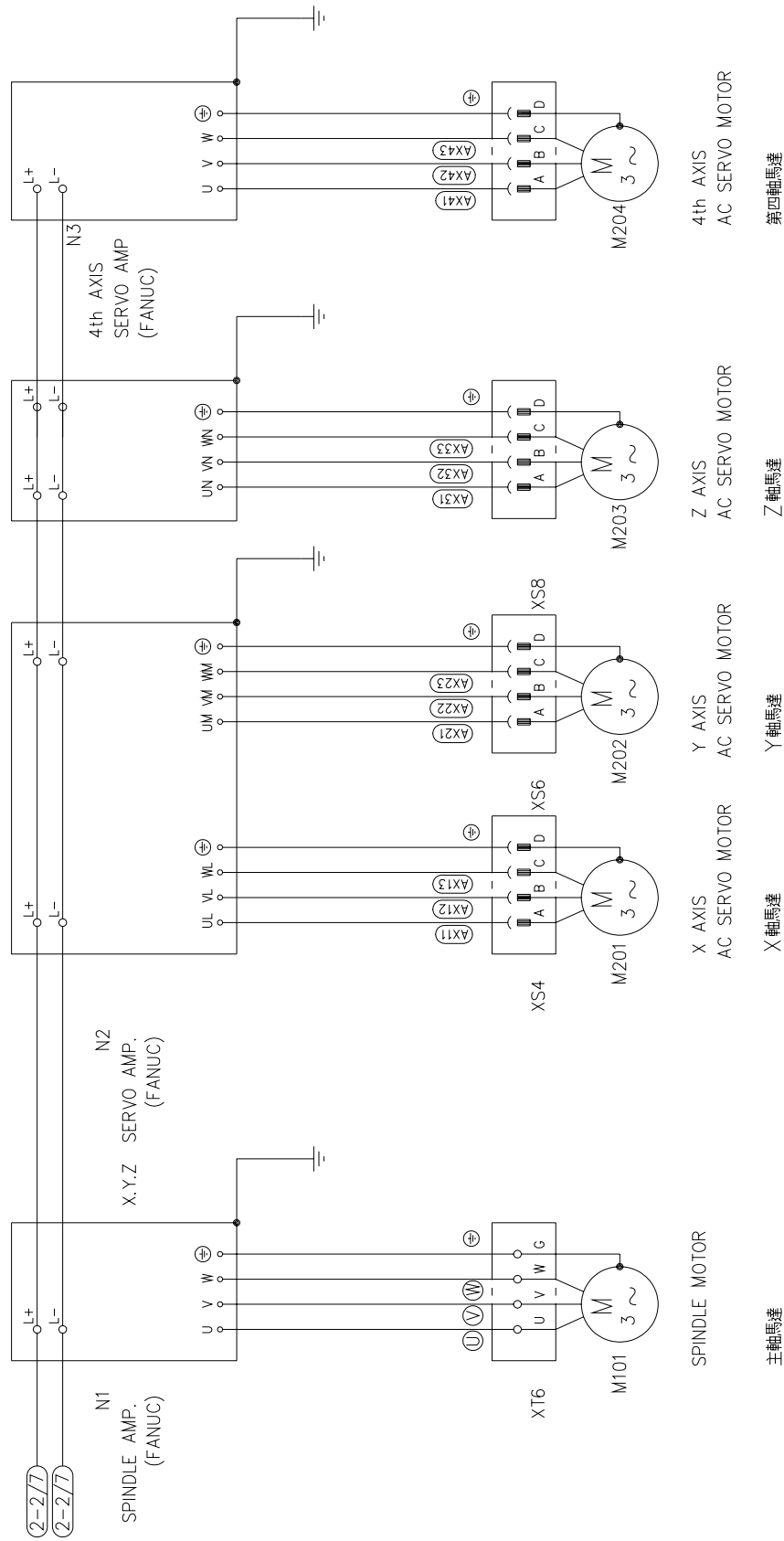
電器箱風扇

電器箱風扇

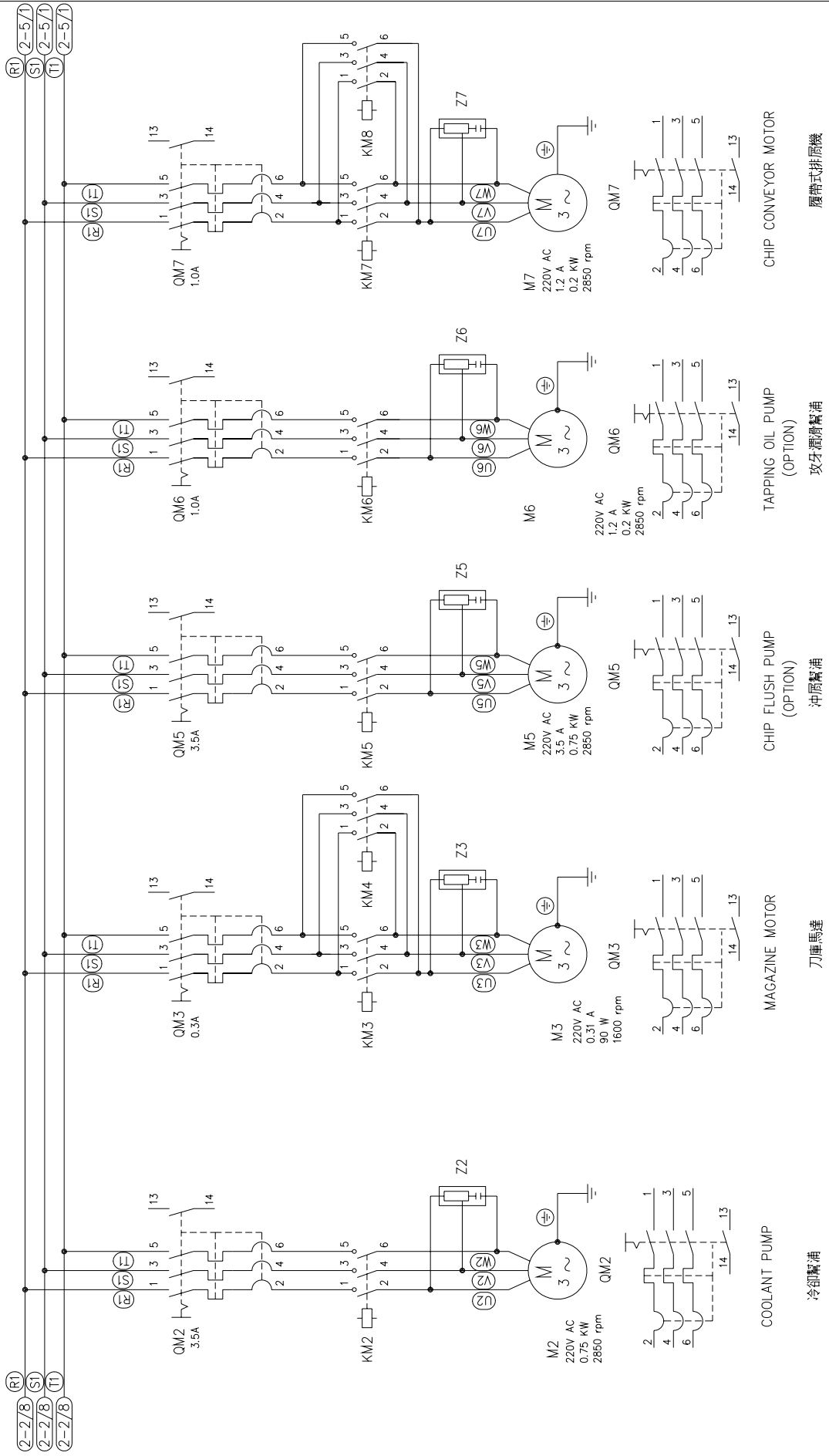
伺服電源供應器  
CX1A 迴路



1 2 3 4 5 6 7 8



1 2 3 4 5 6 7 8



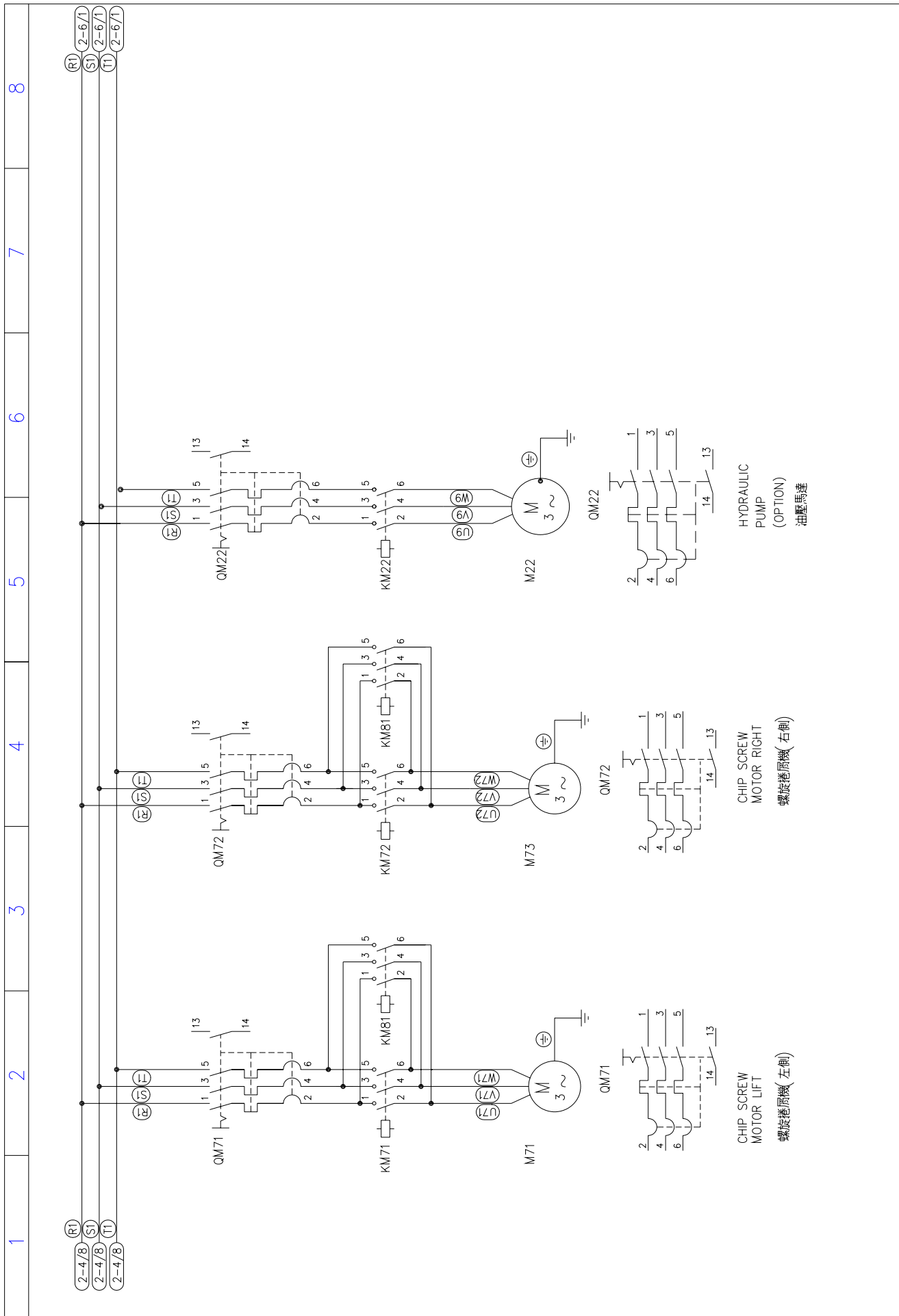
CHIP CONVEYOR MOTOR  
履帶式排屑機

TAPPING OIL PUMP  
(OPTION)  
攻牙潤滑幫浦

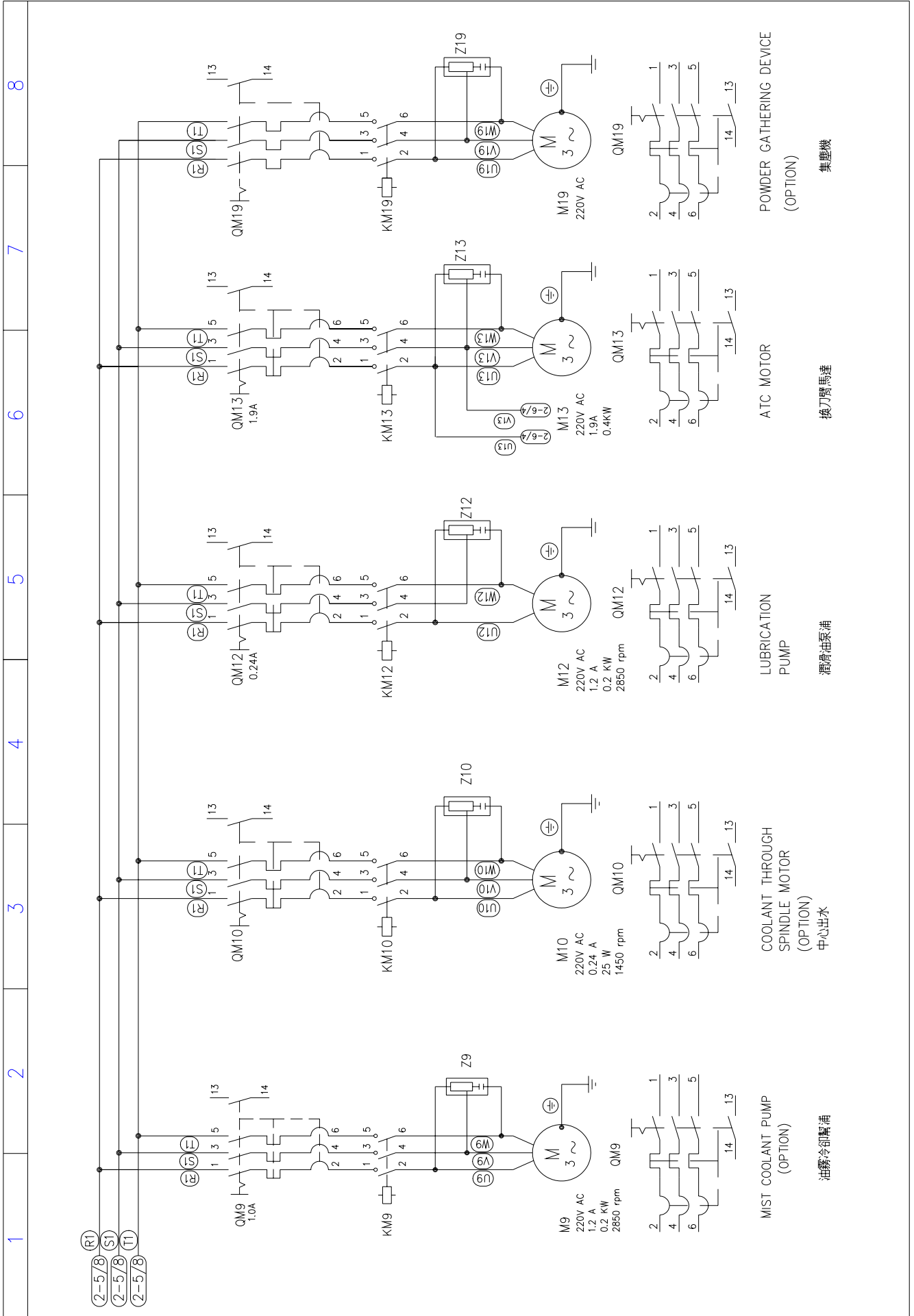
CHIP FLUSH PUMP  
(OPTION)  
沖屑幫浦

MAGAZINE MOTOR  
刀庫馬達

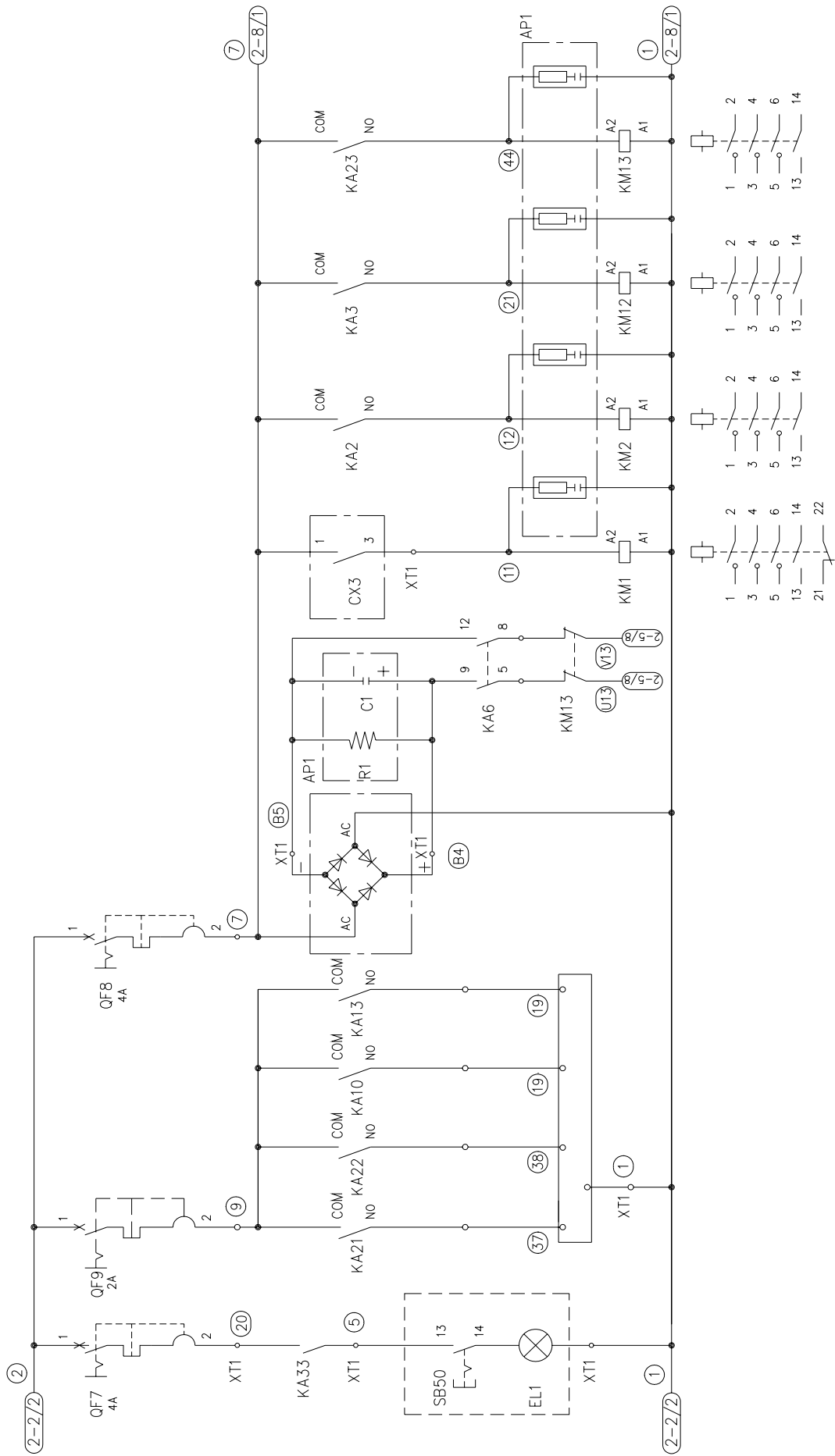
COOLANT PUMP  
冷卻幫浦







1 2 3 4 5 6 7 8



WORK LIGHT 工作燈

ALARM LIGHT 警示燈

ALARM BUZZER 蜂鳴器

CYCLE LIGHT 程式執行燈

PROGRAM FINISH LIGHT 程式結束燈

ALARM BUZZER 蜂鳴器

ATC MOTOR BRAKE (OPTION) 換刀臂剎車

MACHINE READY 機械預備

COOLANT PUMP 冷卻泵浦

LUBRICATION PUMP 潤滑油泵浦

ATC MOTOR 換刀臂馬達

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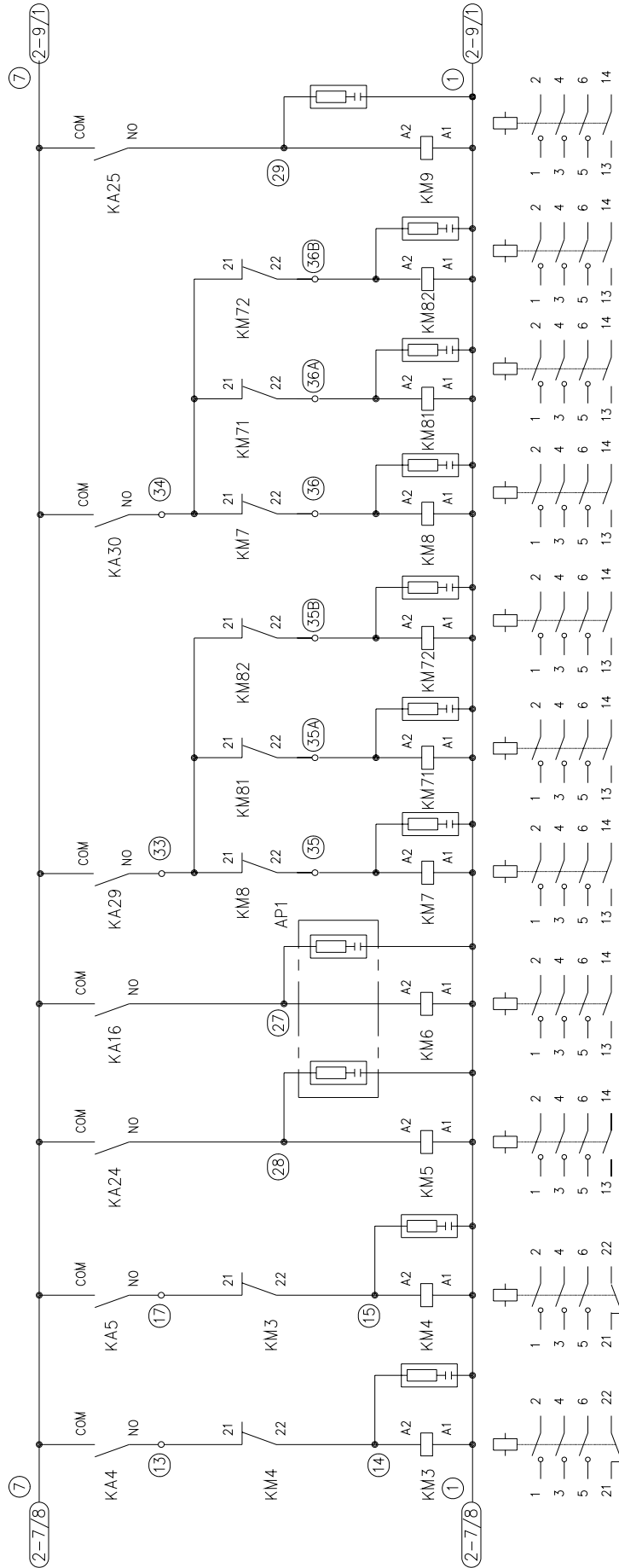
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MIST COOLANT  
OIL PUMP  
(OPTION)

油霧冷却幫浦

CHIP CONVEYDR  
CHIP SCREW (LIFT)  
CHIP SCREW (RIGHT)  
CCW

履帶式排屑機  
螺旋捲屑機(左)  
螺旋捲屑機(右)  
反轉

CHIP CONVEYDR  
CHIP SCREW (LIFT)  
CHIP SCREW (RIGHT)  
CW

履帶式排屑機  
螺旋捲屑機(左)  
螺旋捲屑機(右)  
正轉

TAPPING  
OIL PUMP  
(OPTION)

攻牙潤滑幫浦

CHIP FLUSH PUMP  
(OPTION)

沖屑幫浦

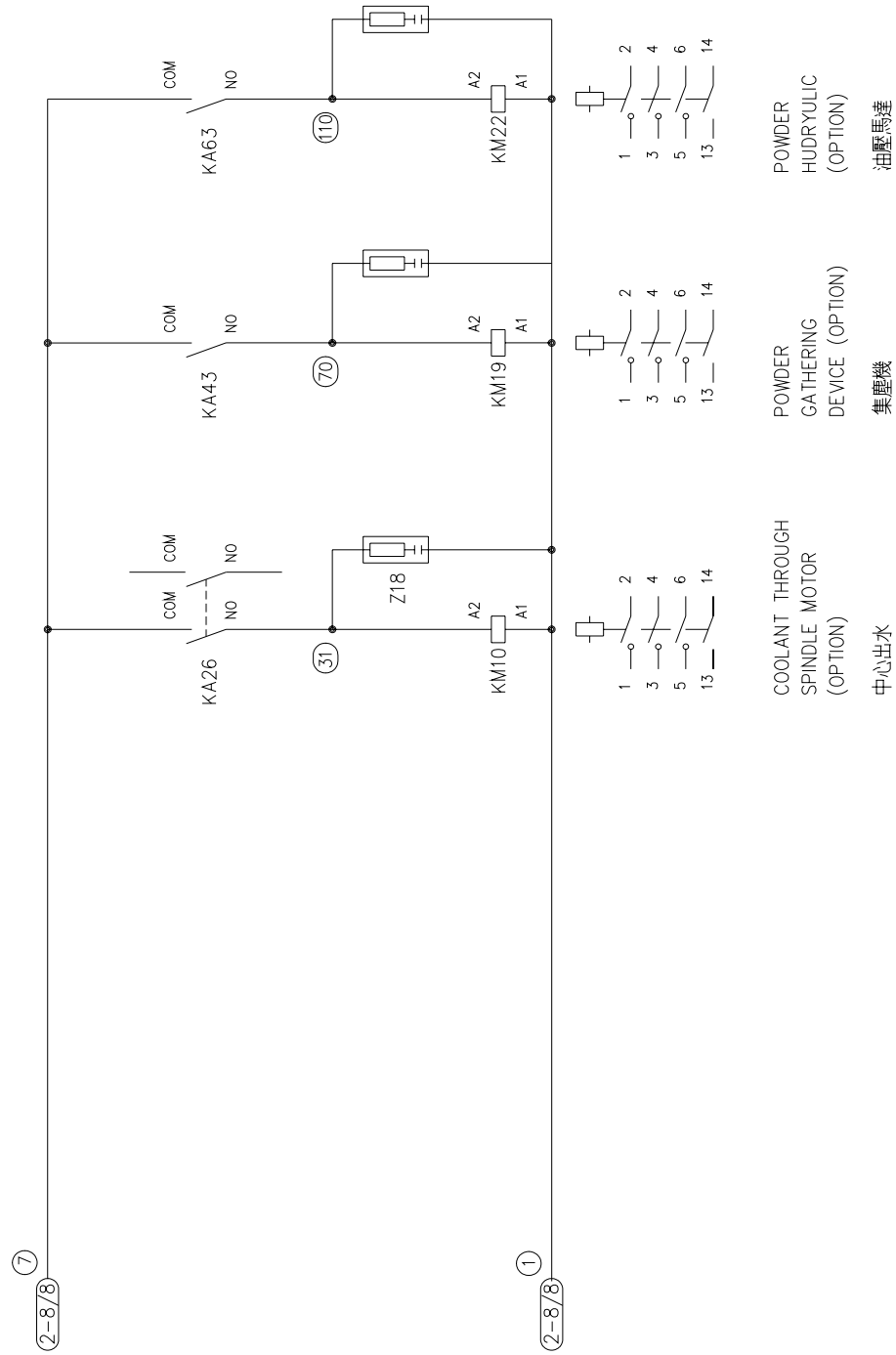
MAGAZINE  
MOTOR CCW

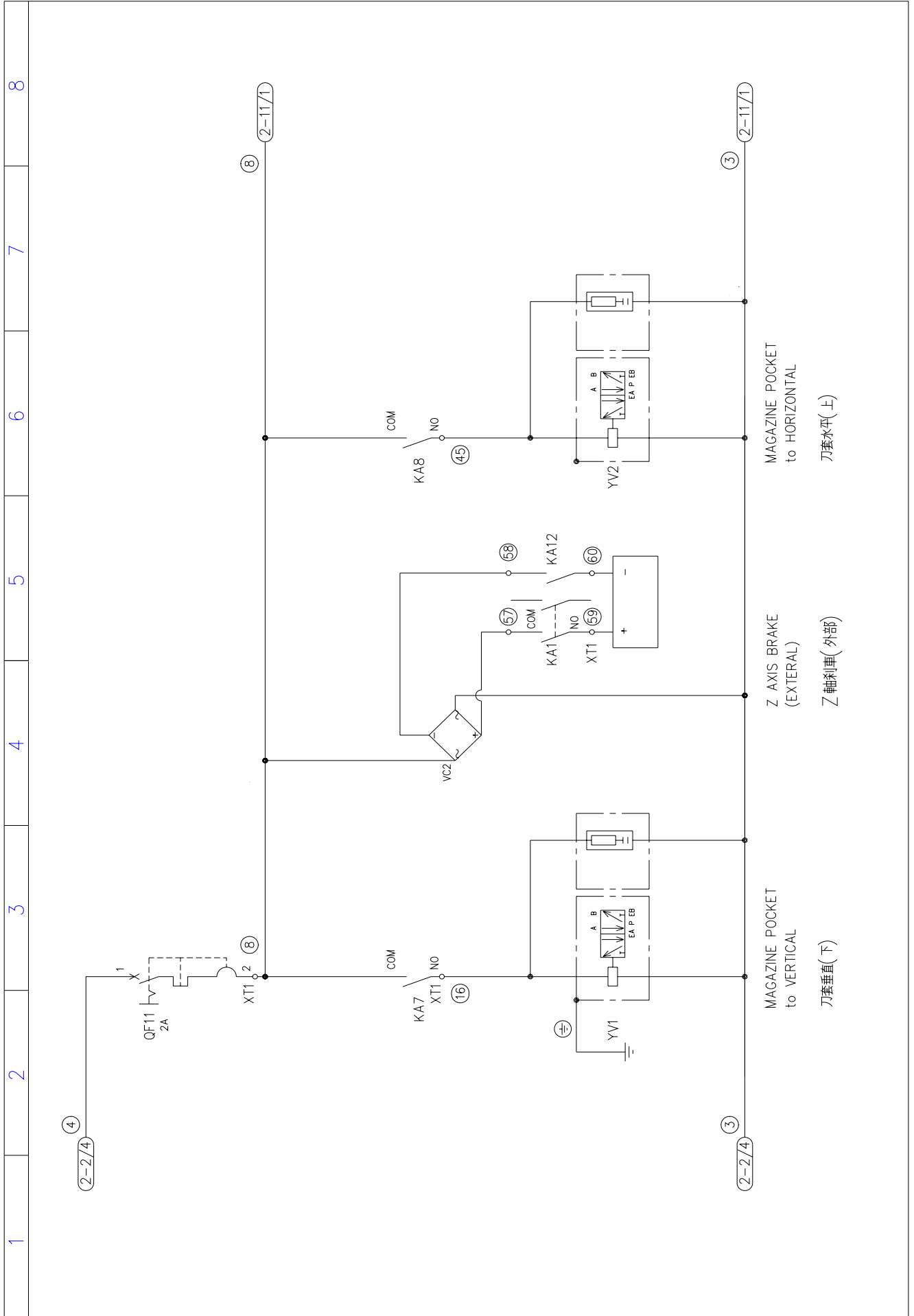
刀庫馬達反轉

MAGAZINE  
MOTOR CW

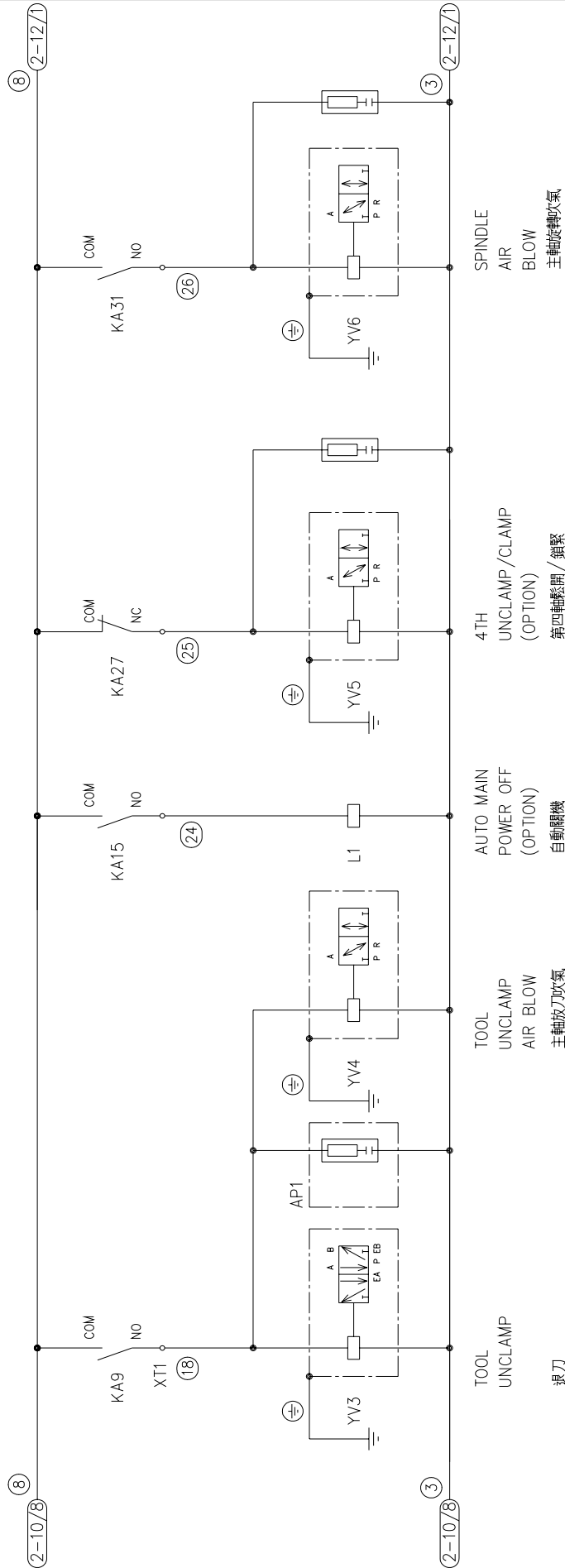
刀庫馬達正轉

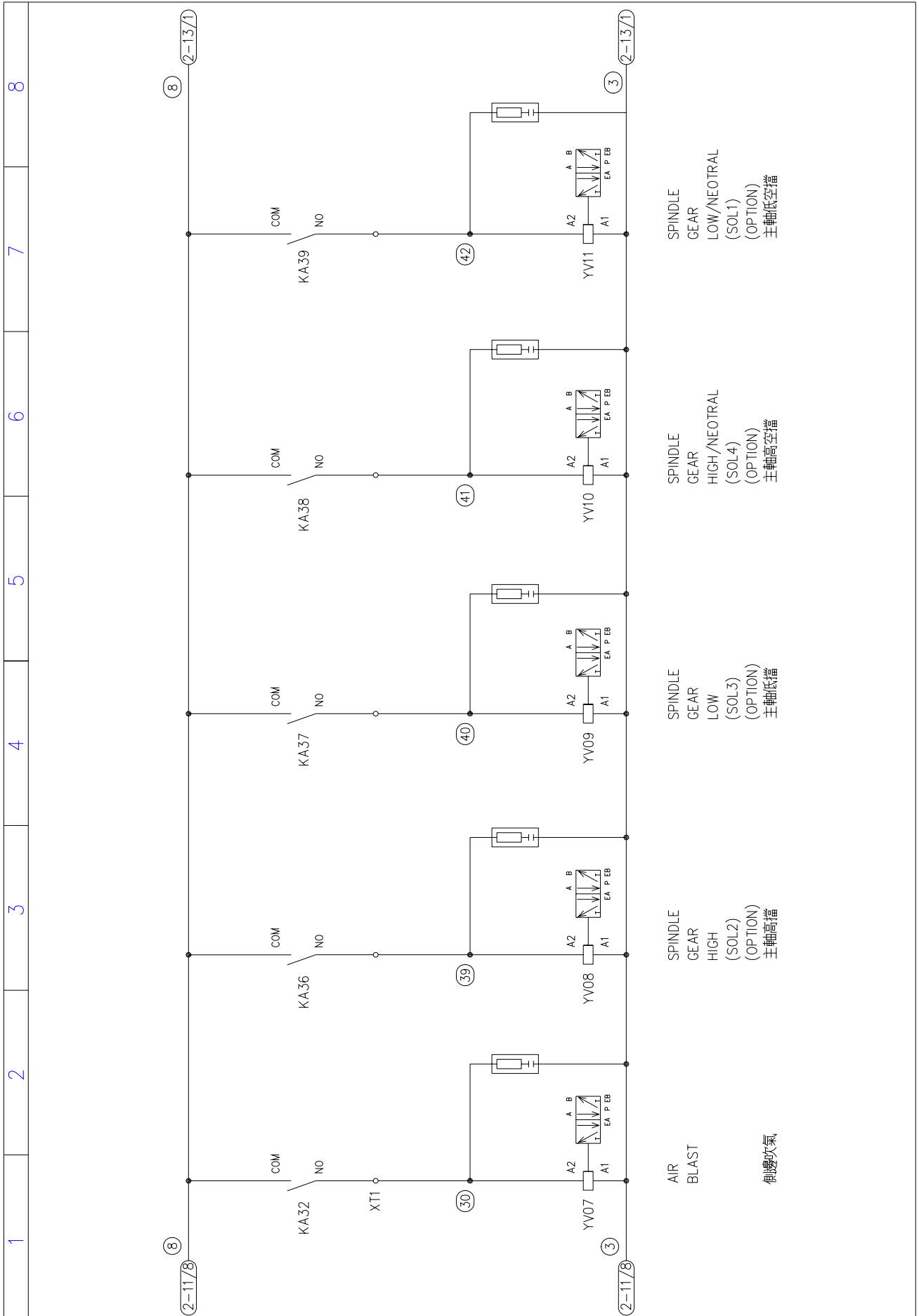
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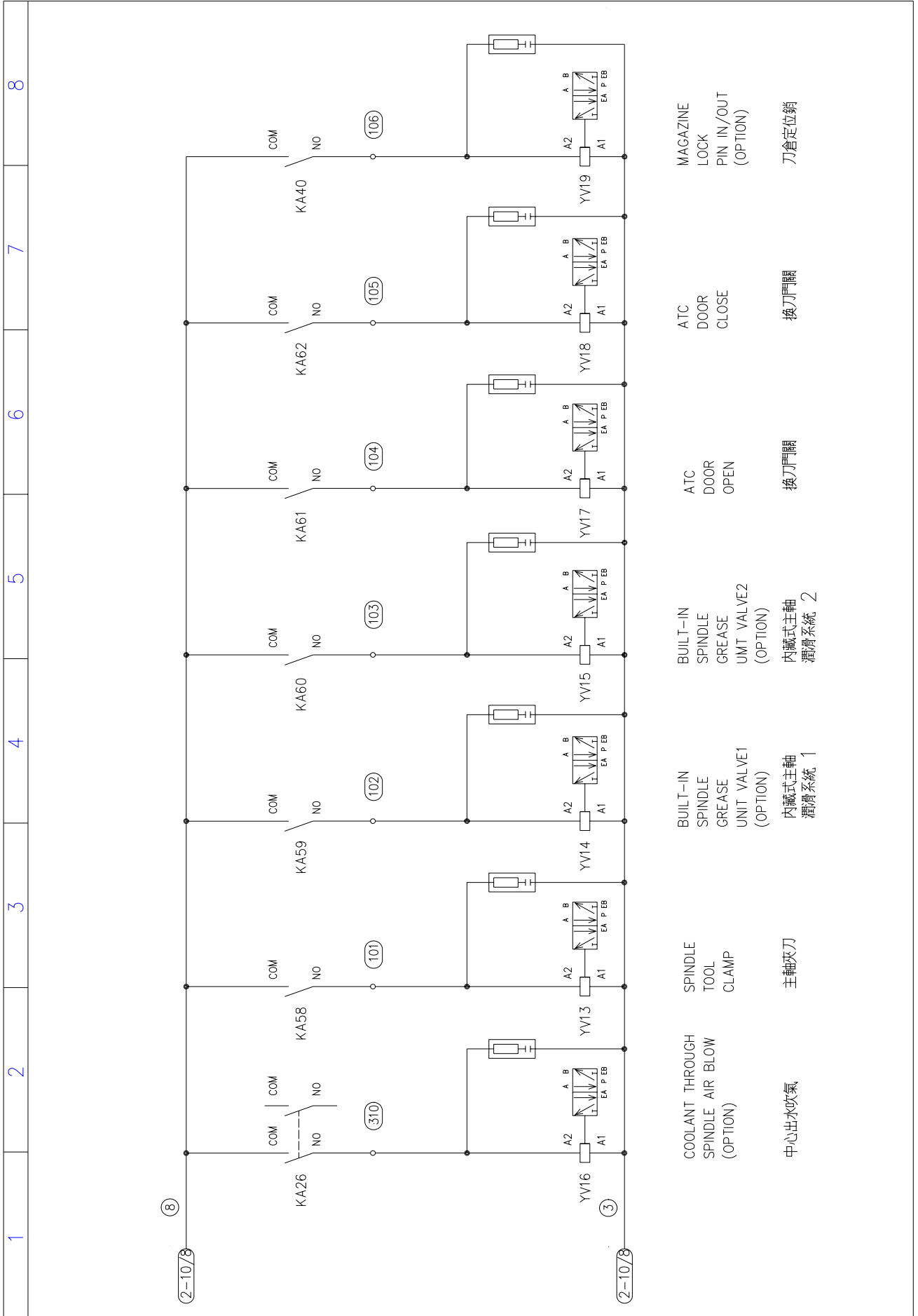




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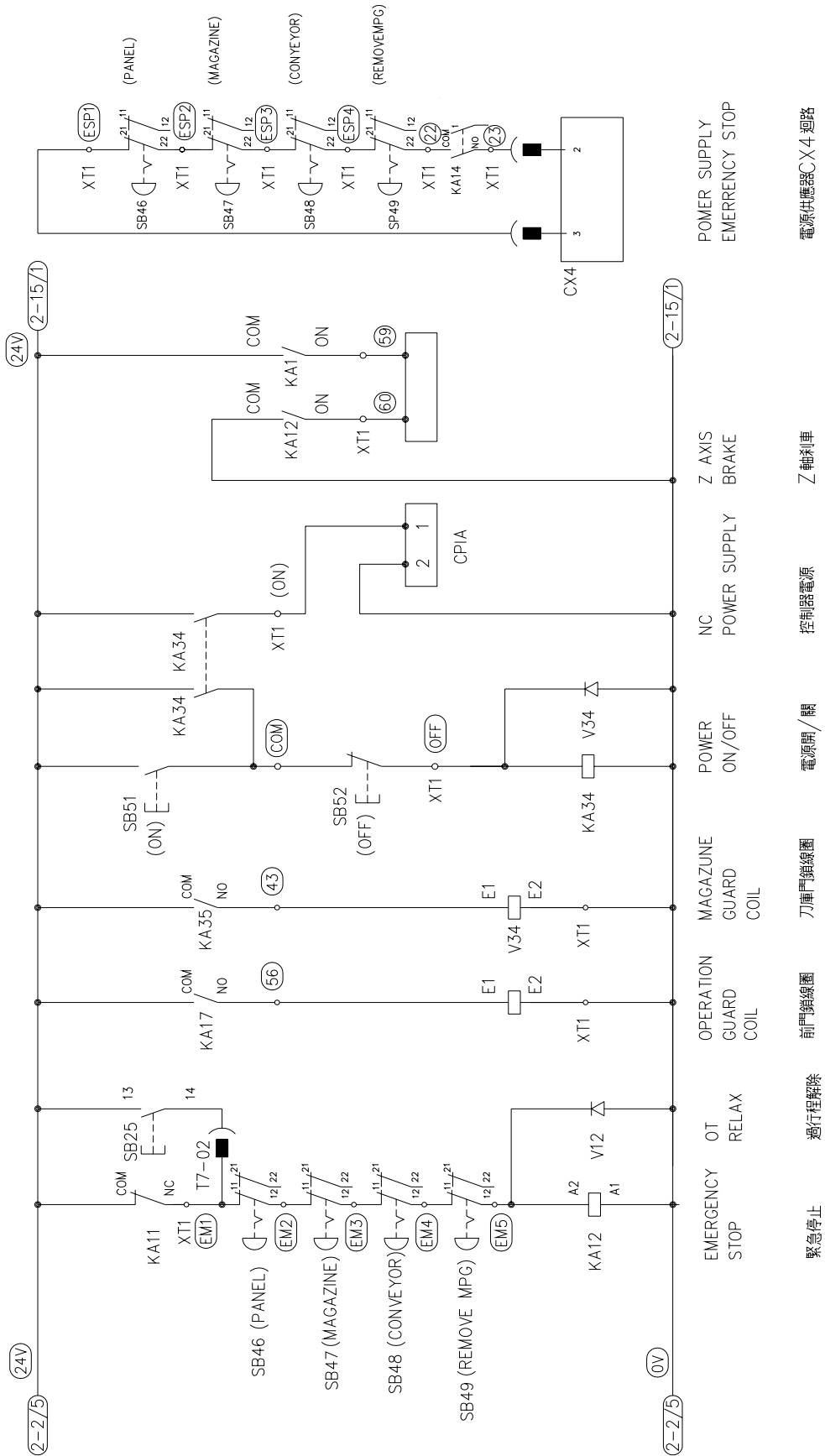
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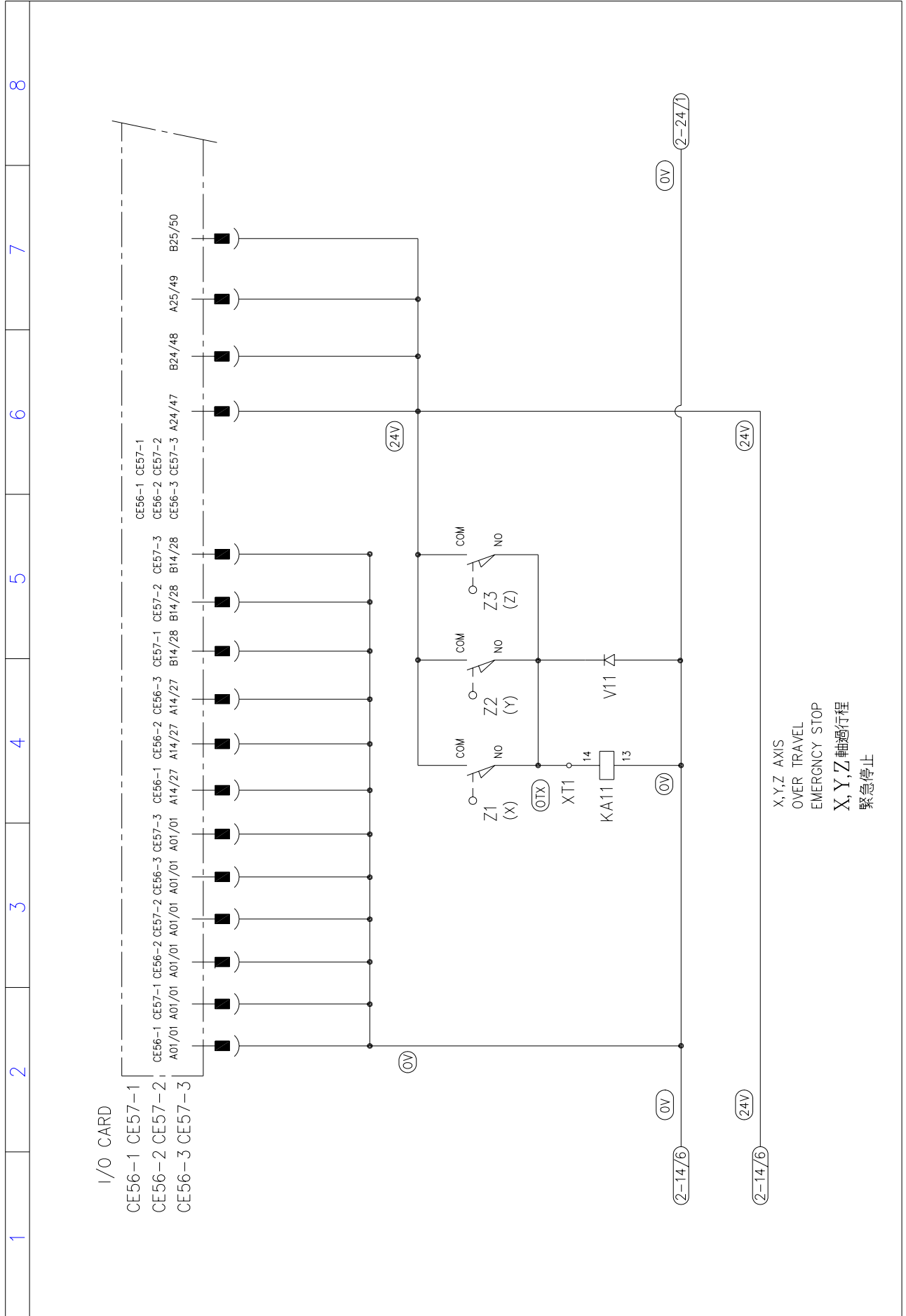
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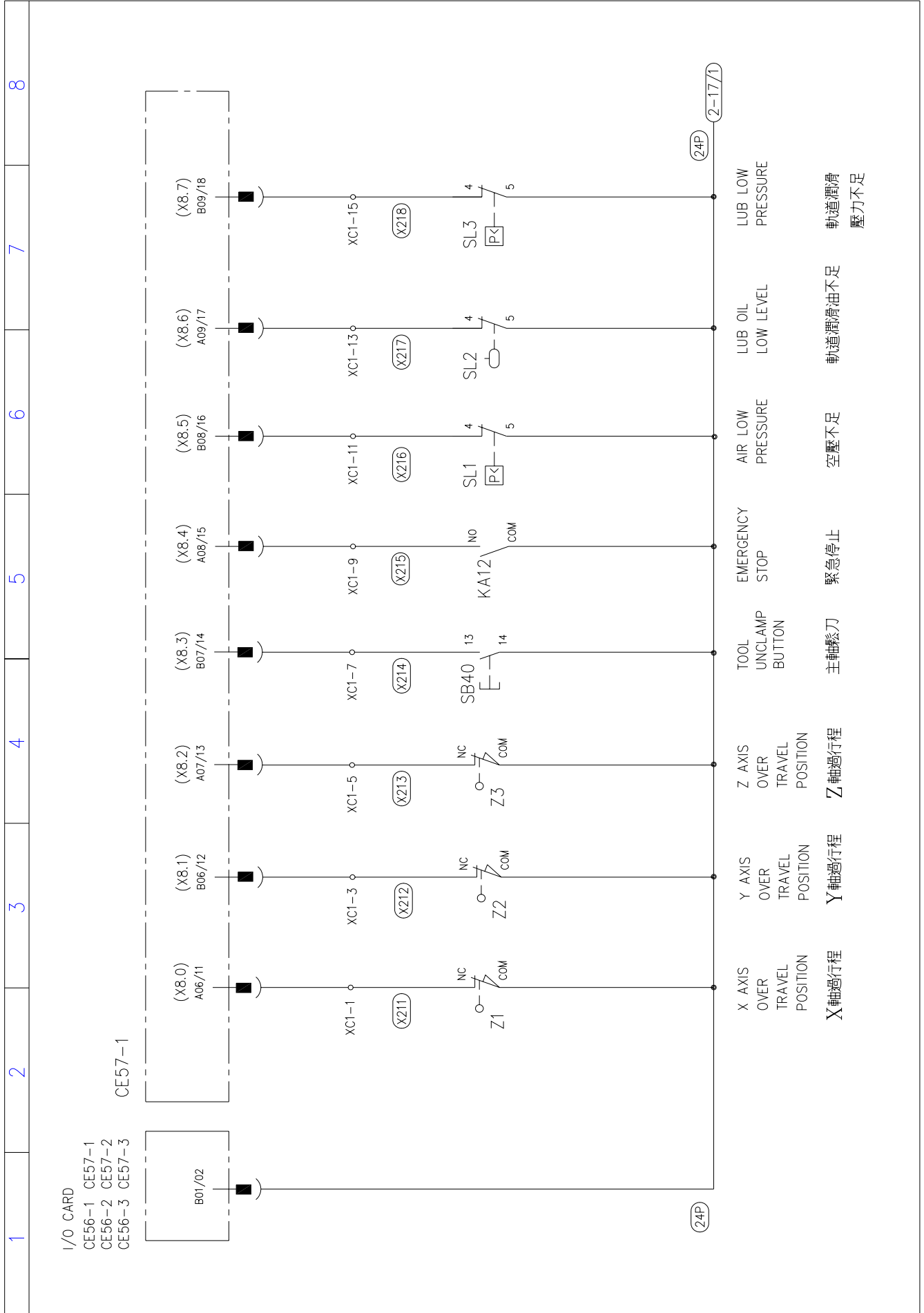
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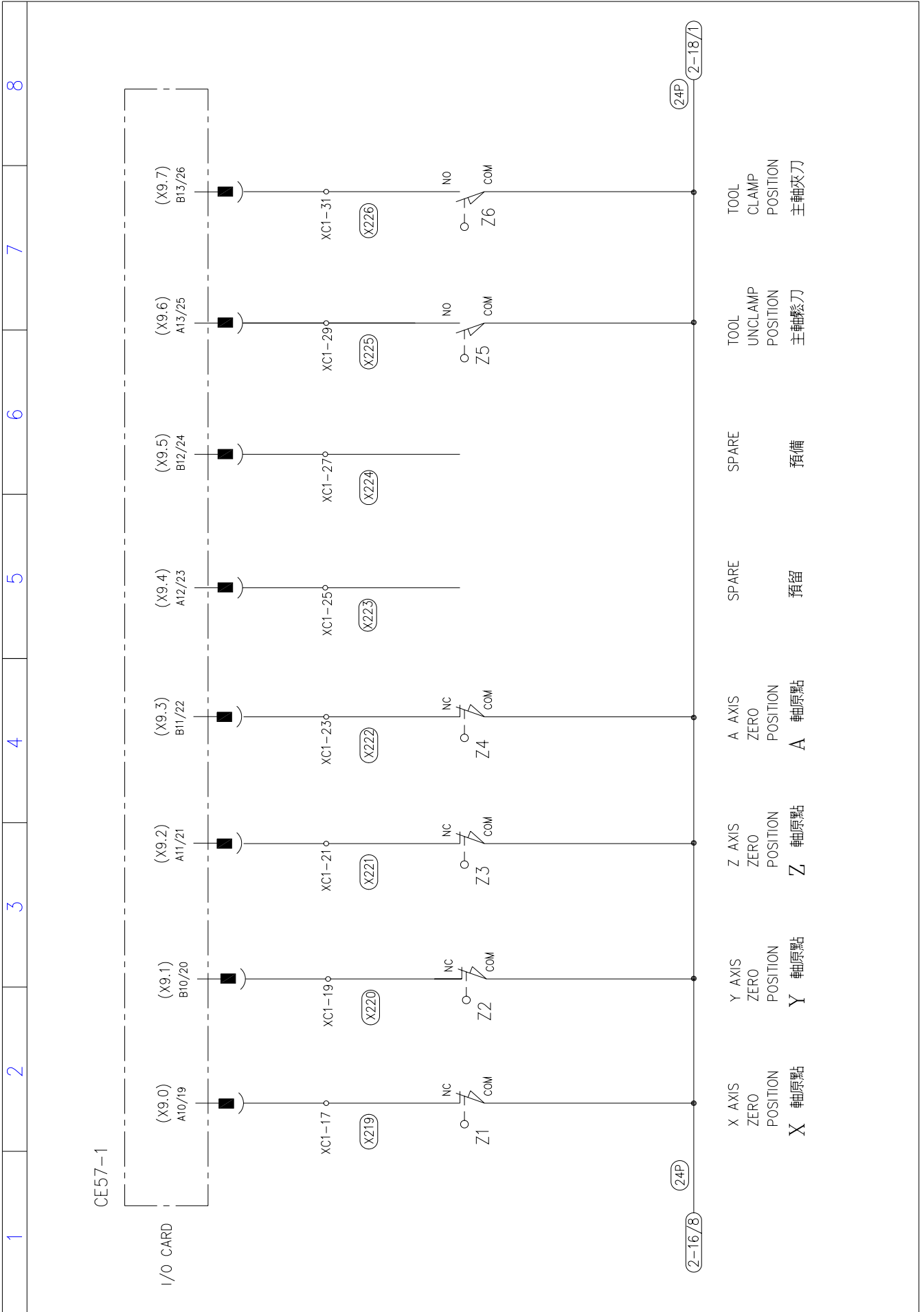
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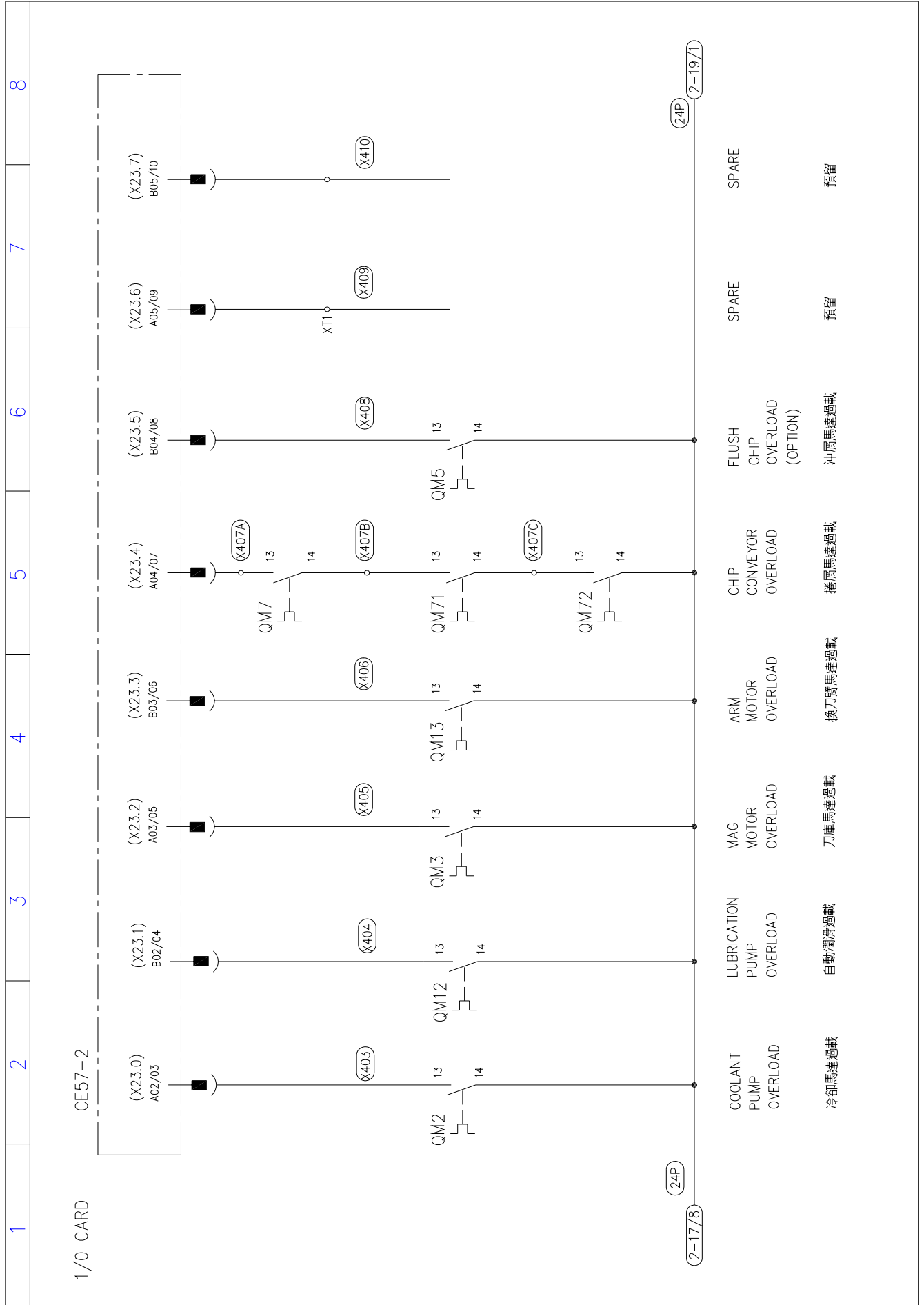
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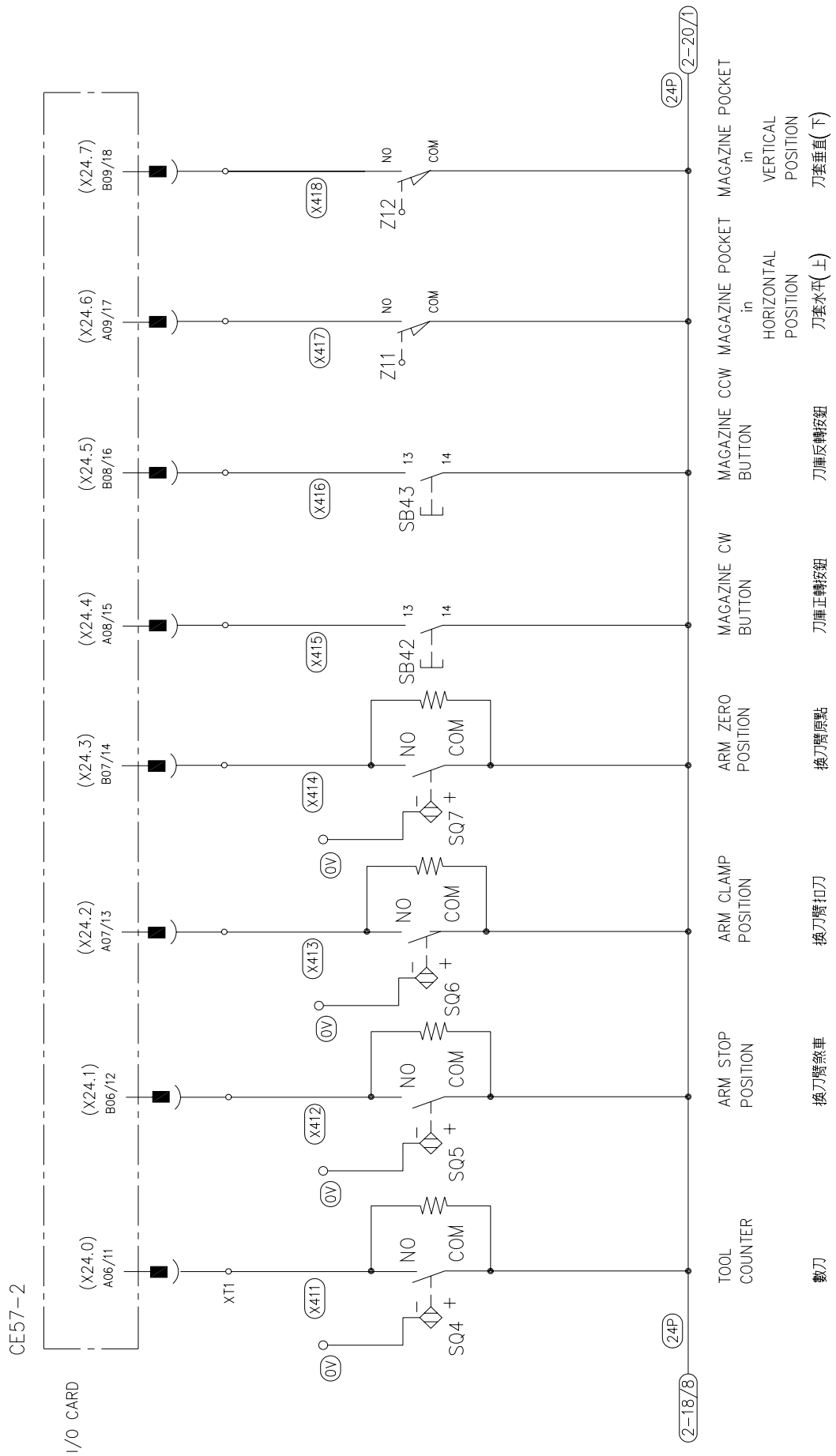




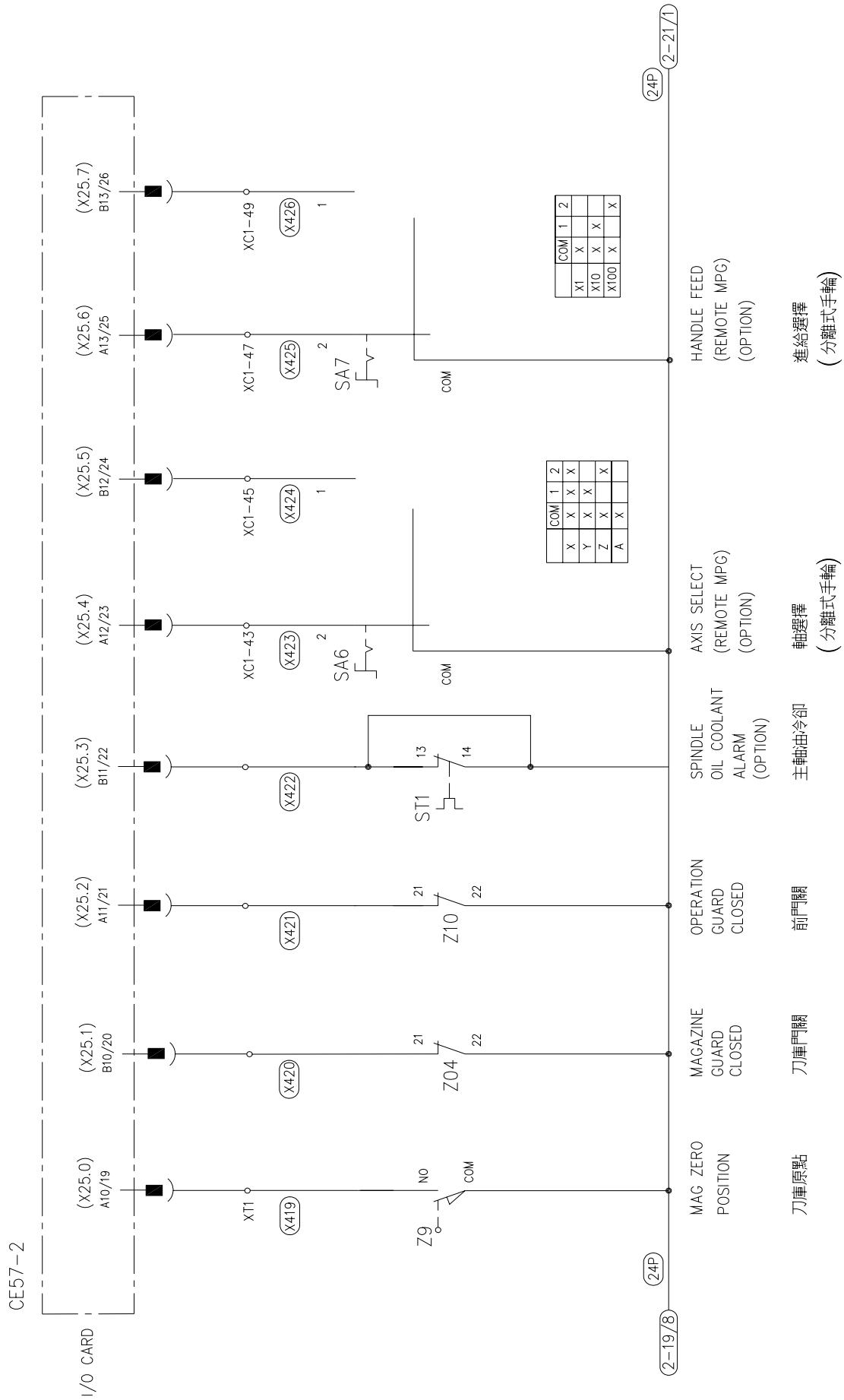




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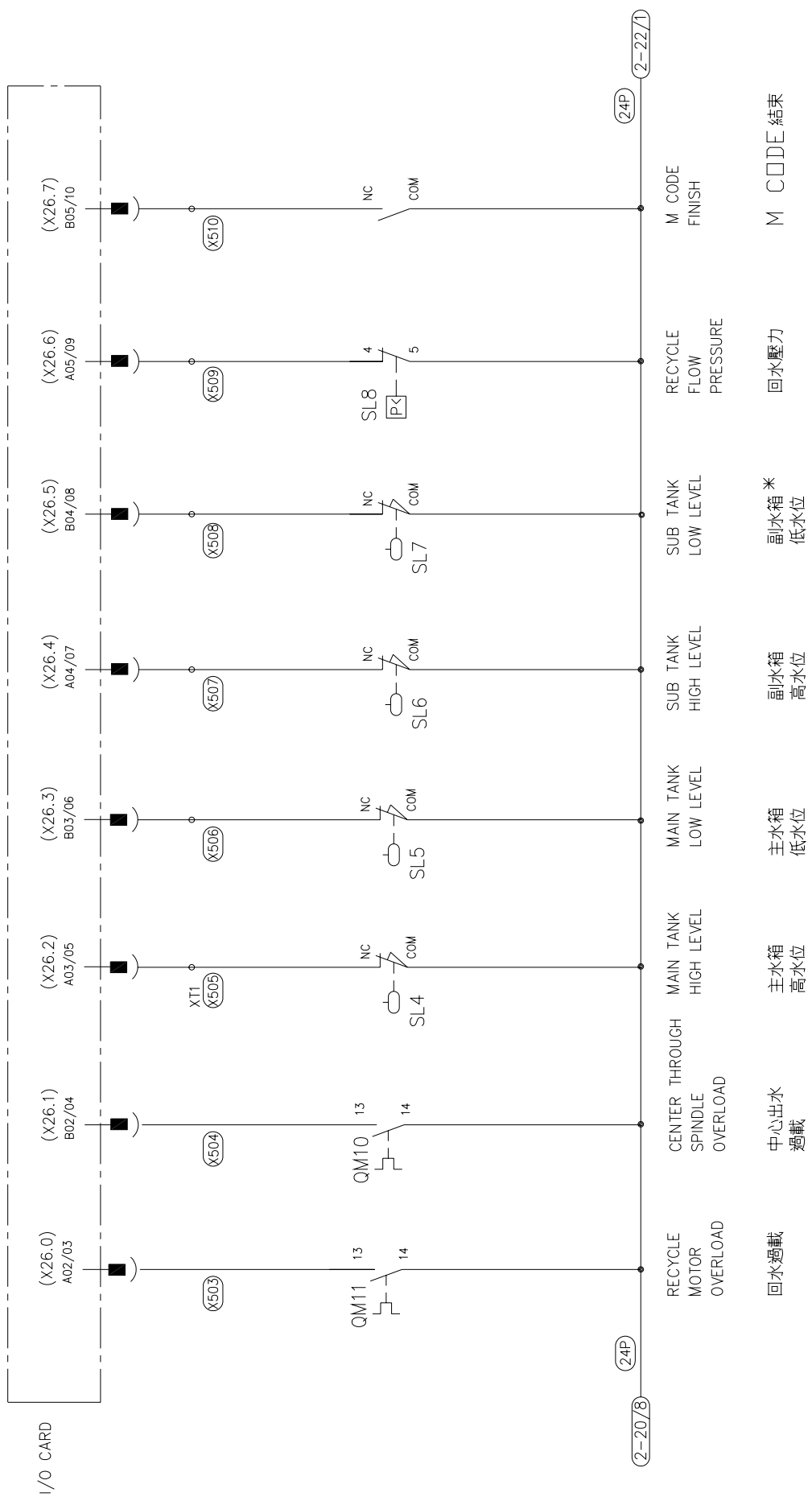


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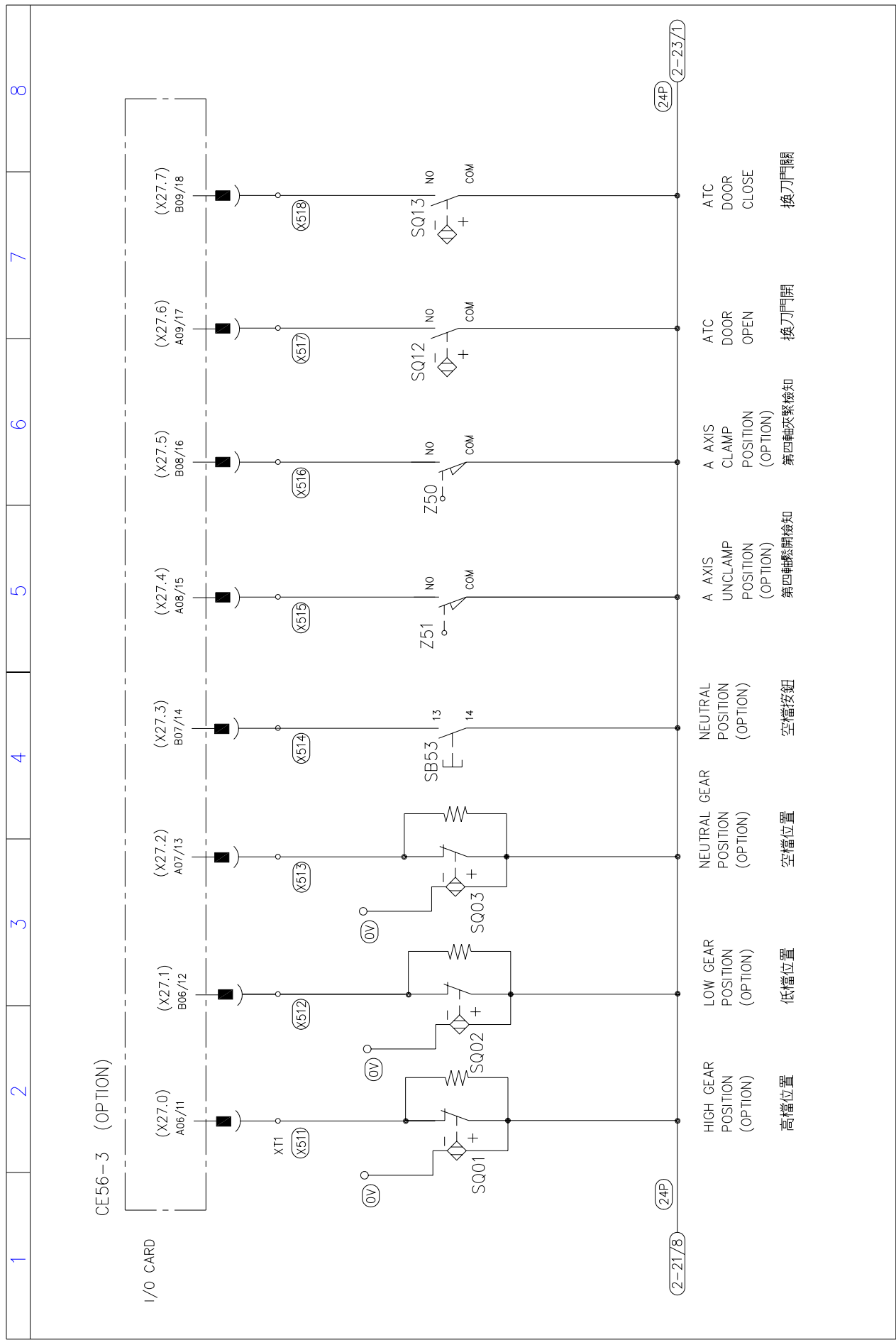
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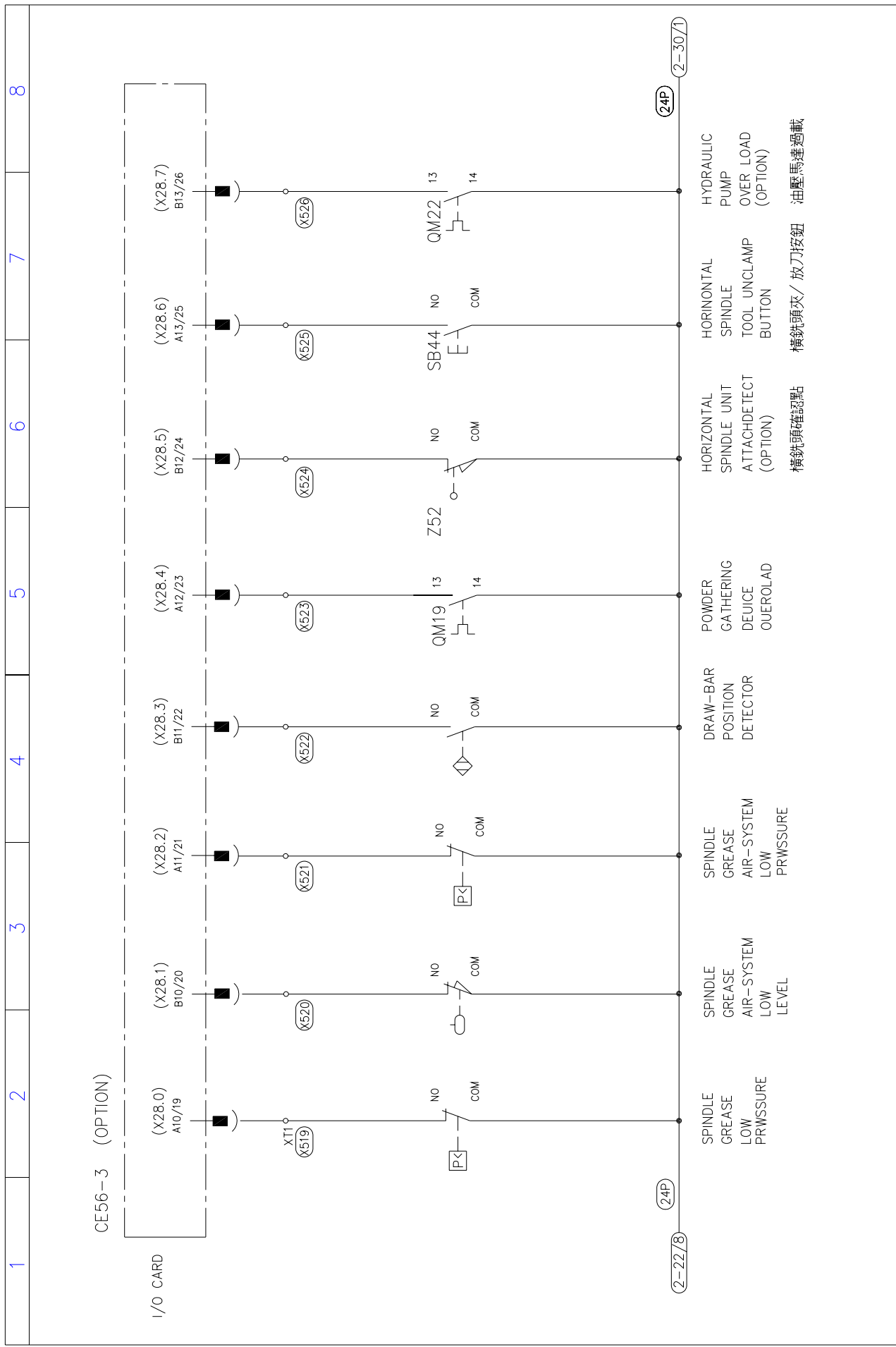
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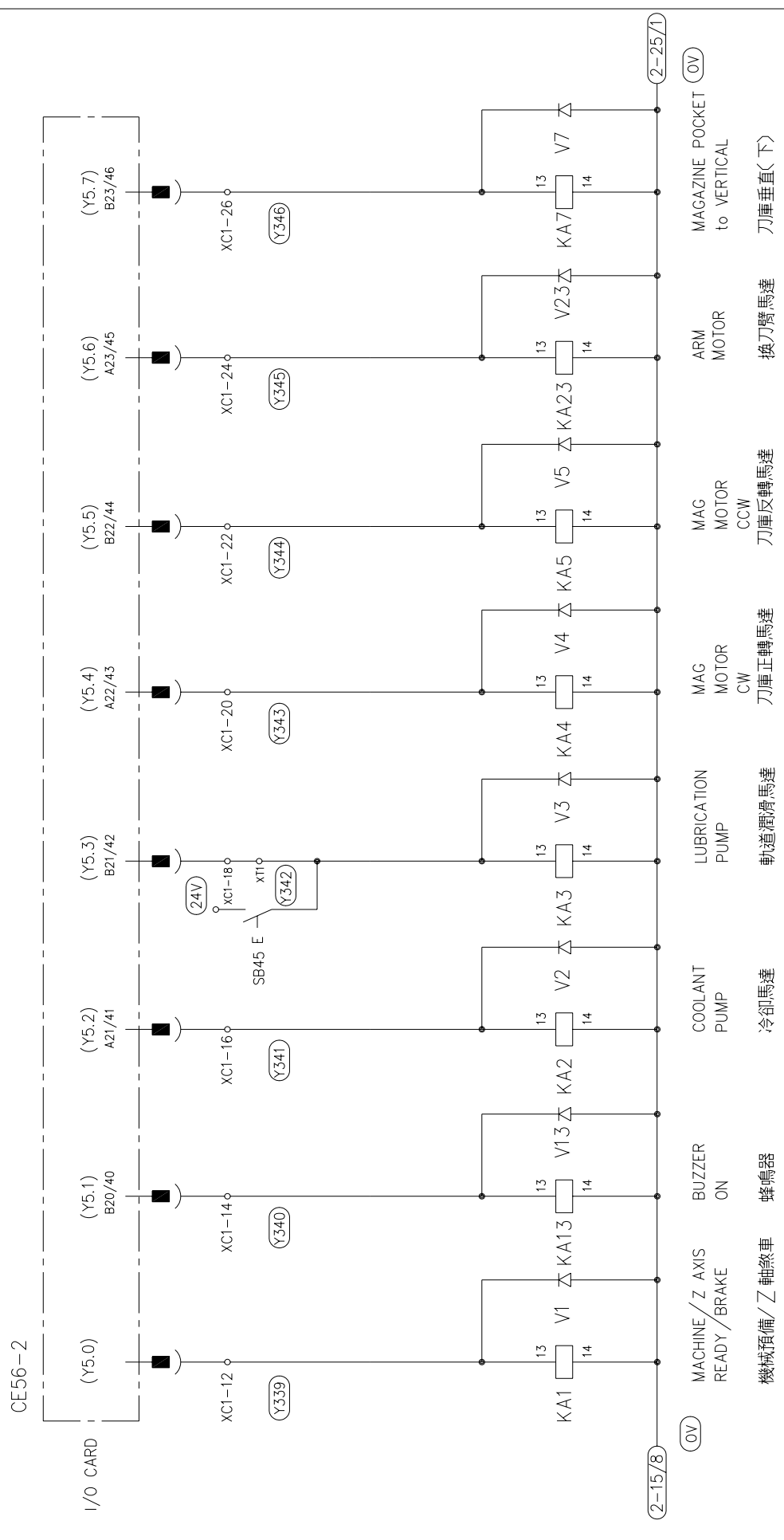


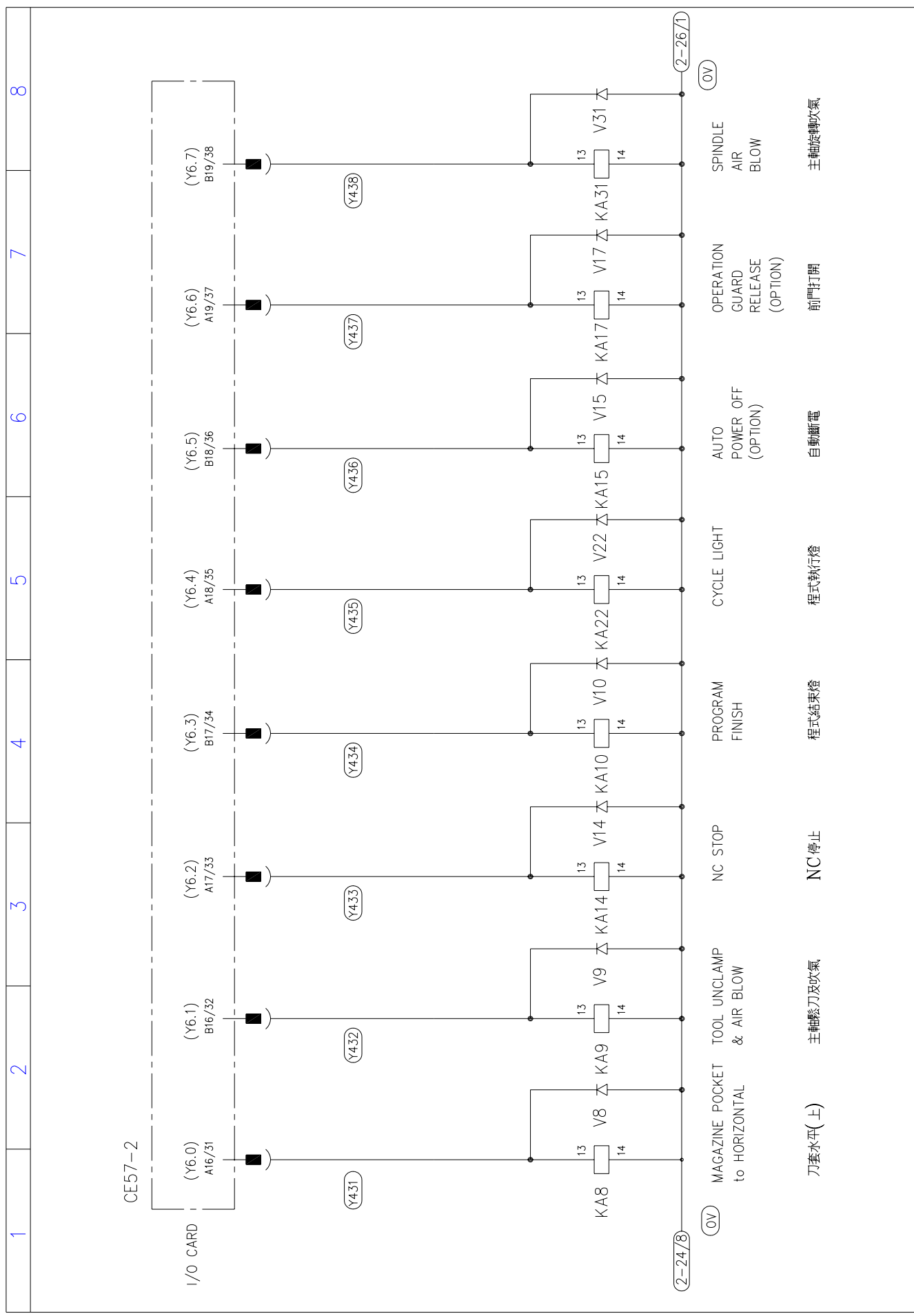
\* 新式中心出水低水位檢出

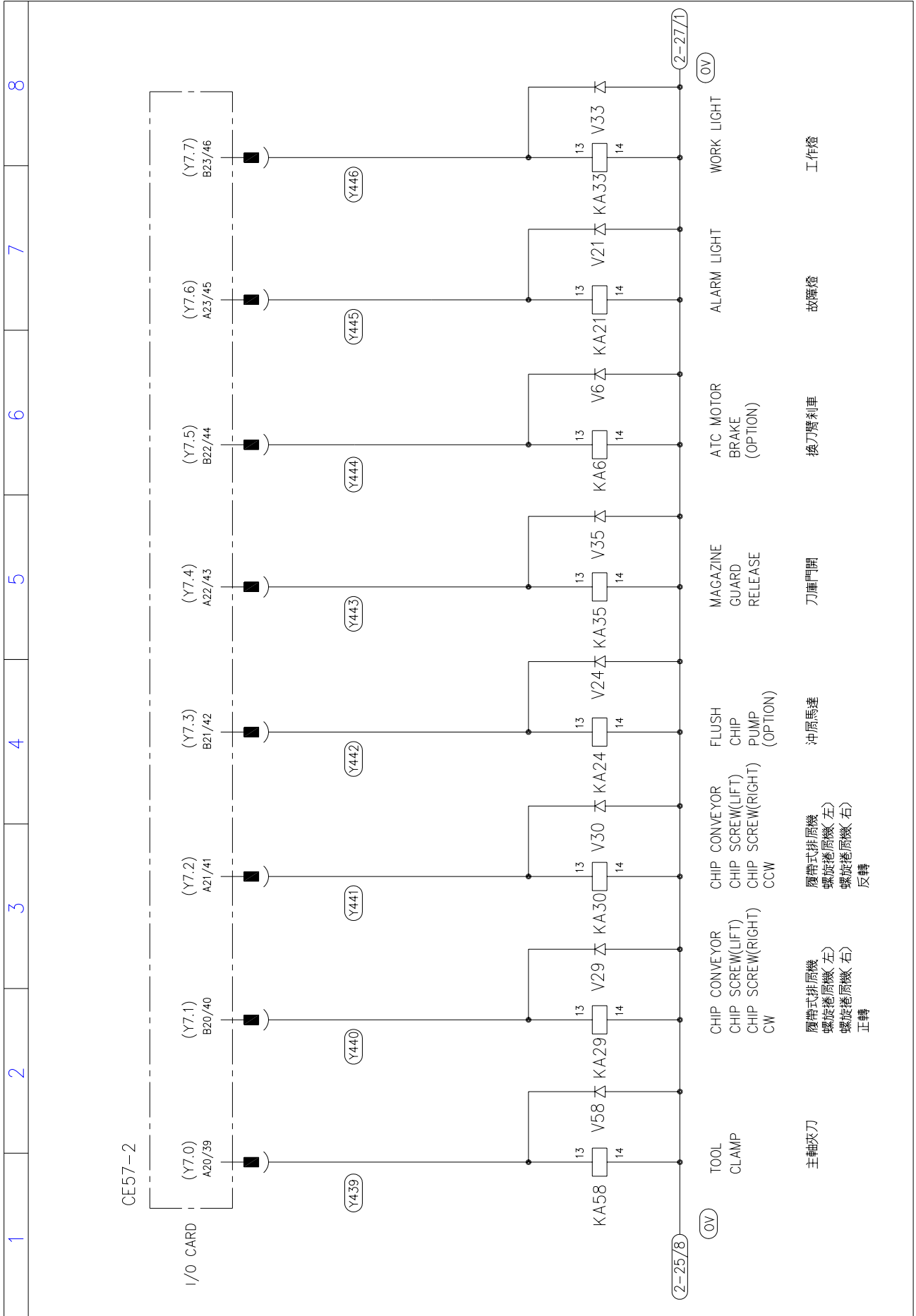


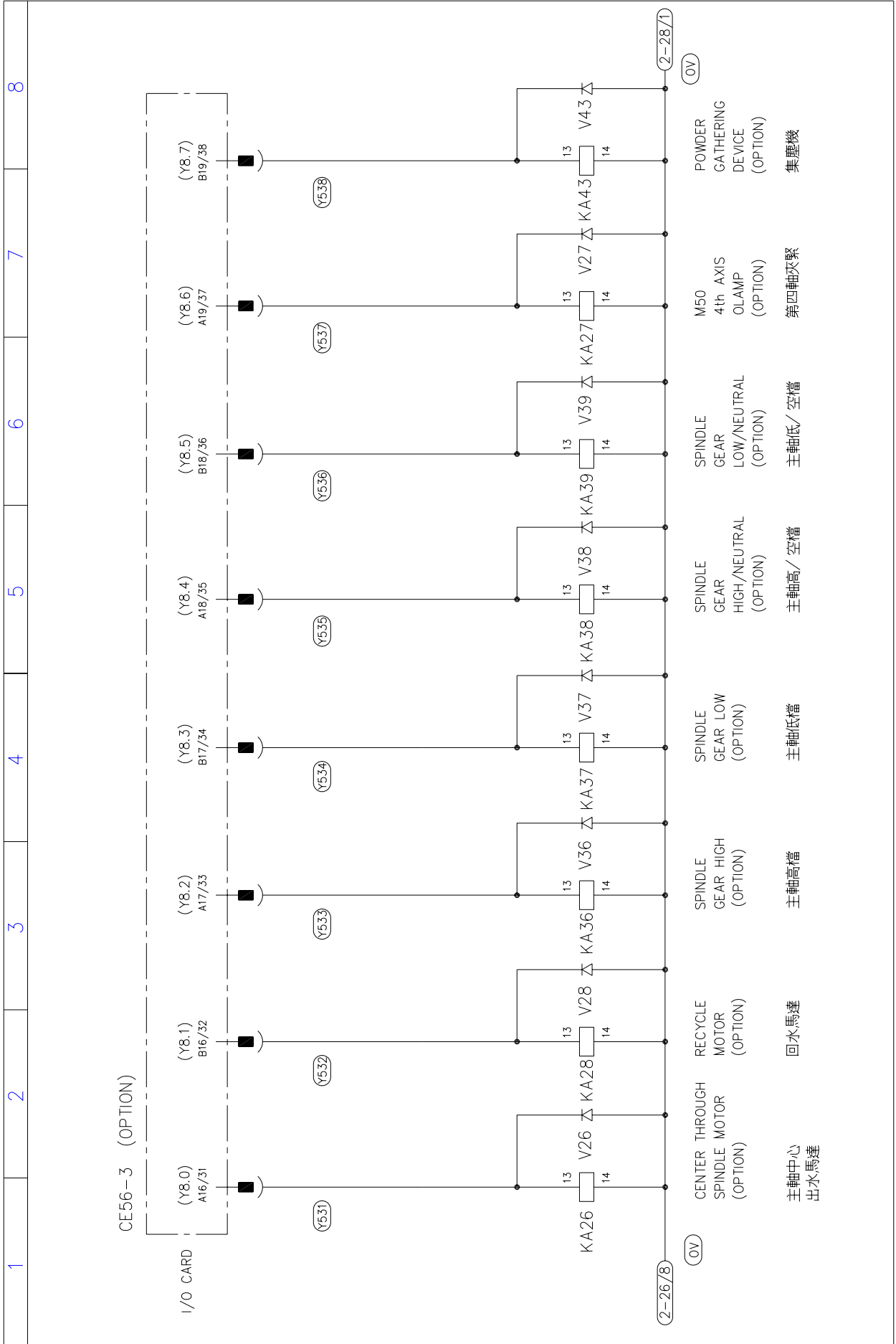






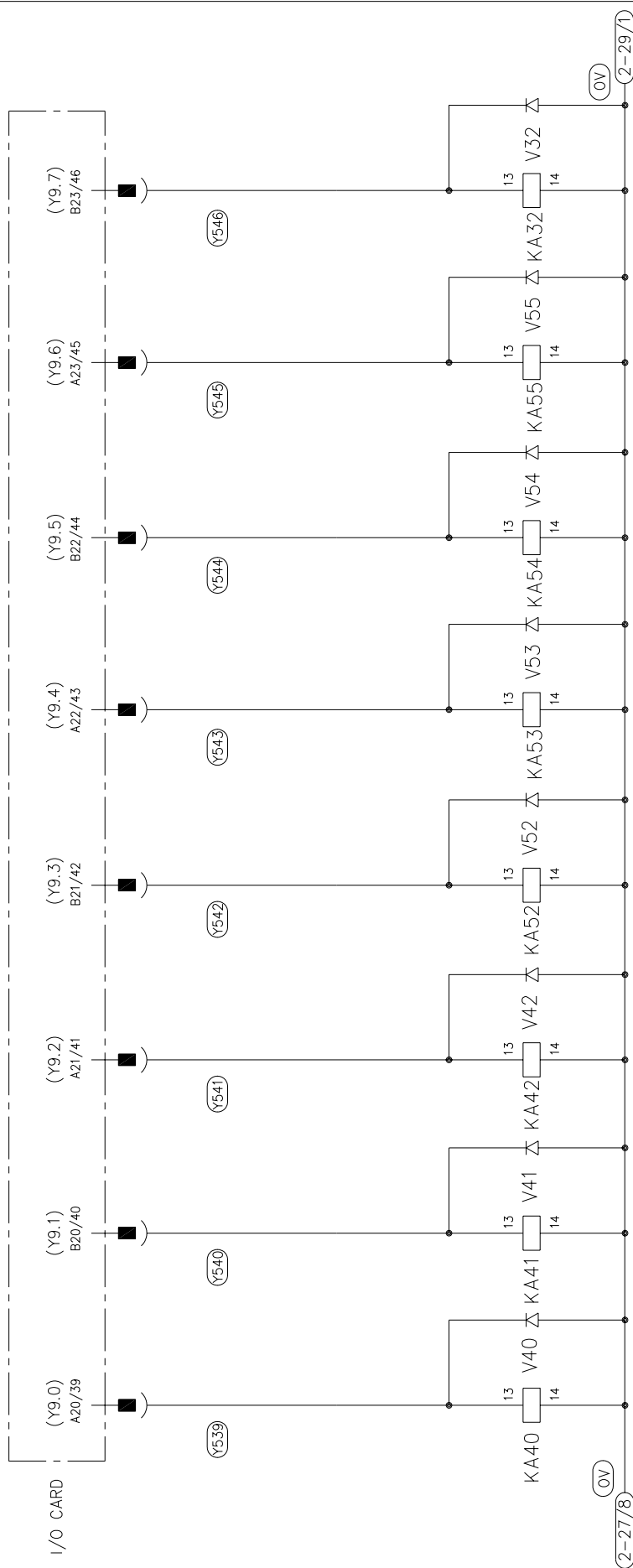




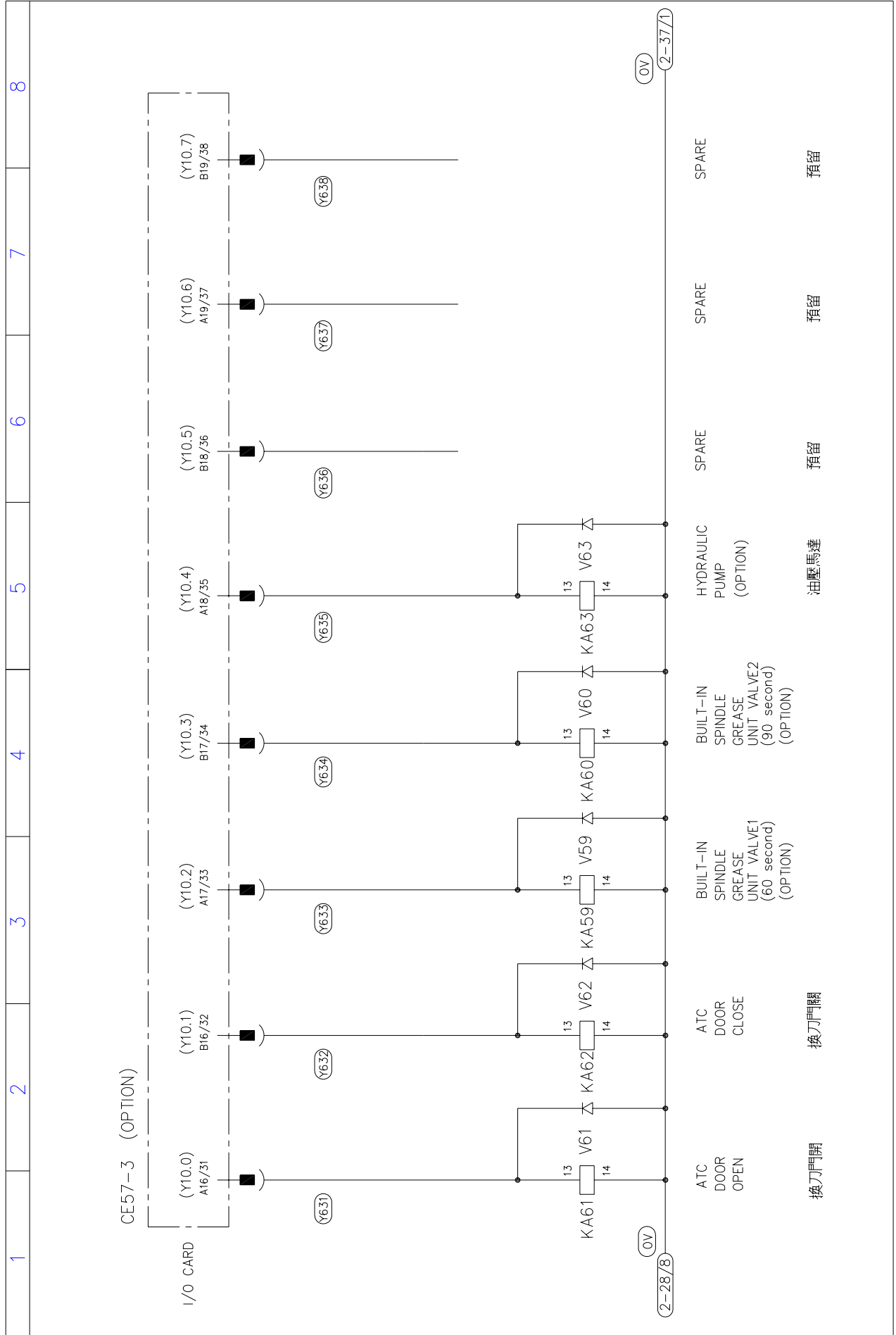


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CE56-3 (OPTION)

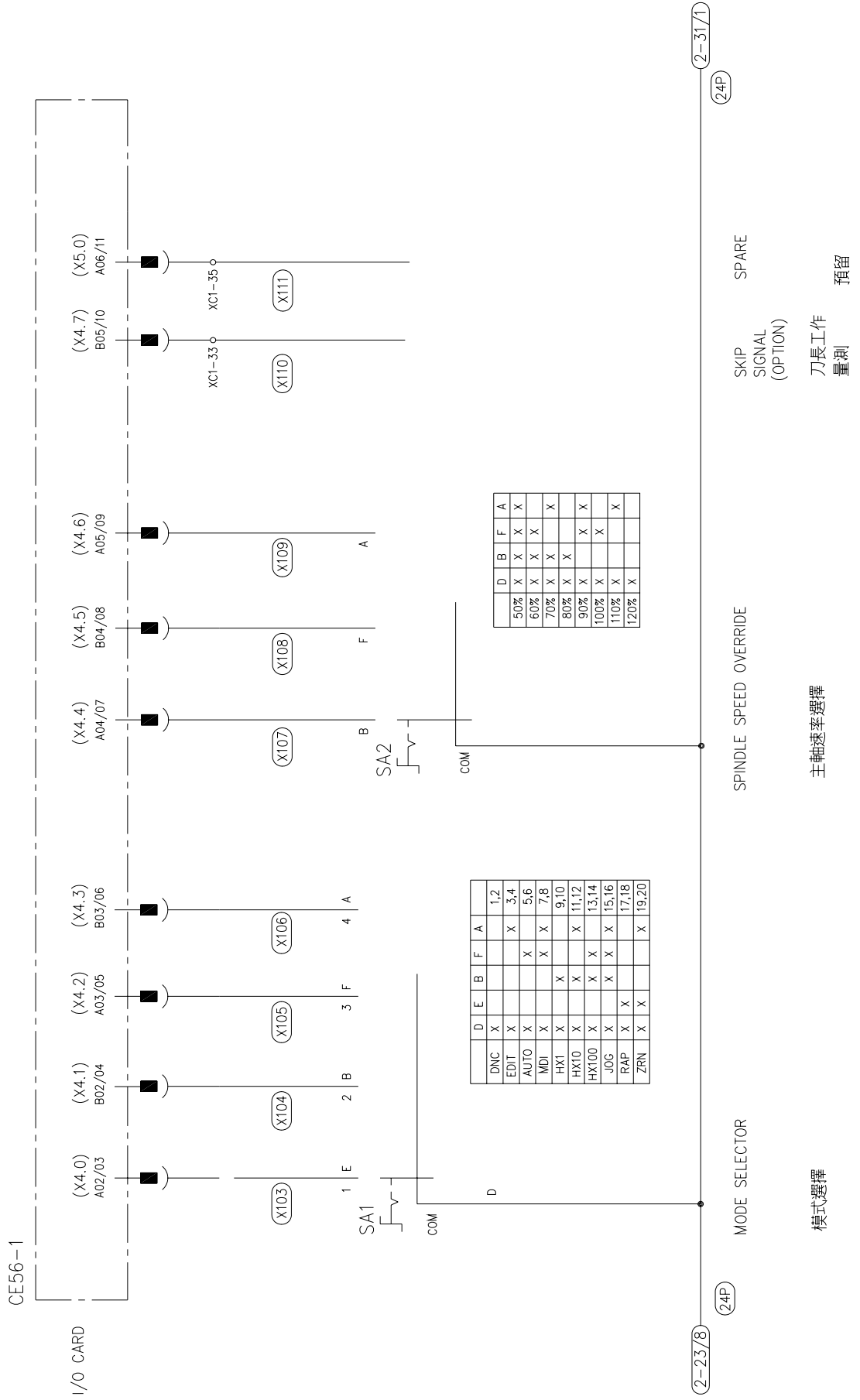


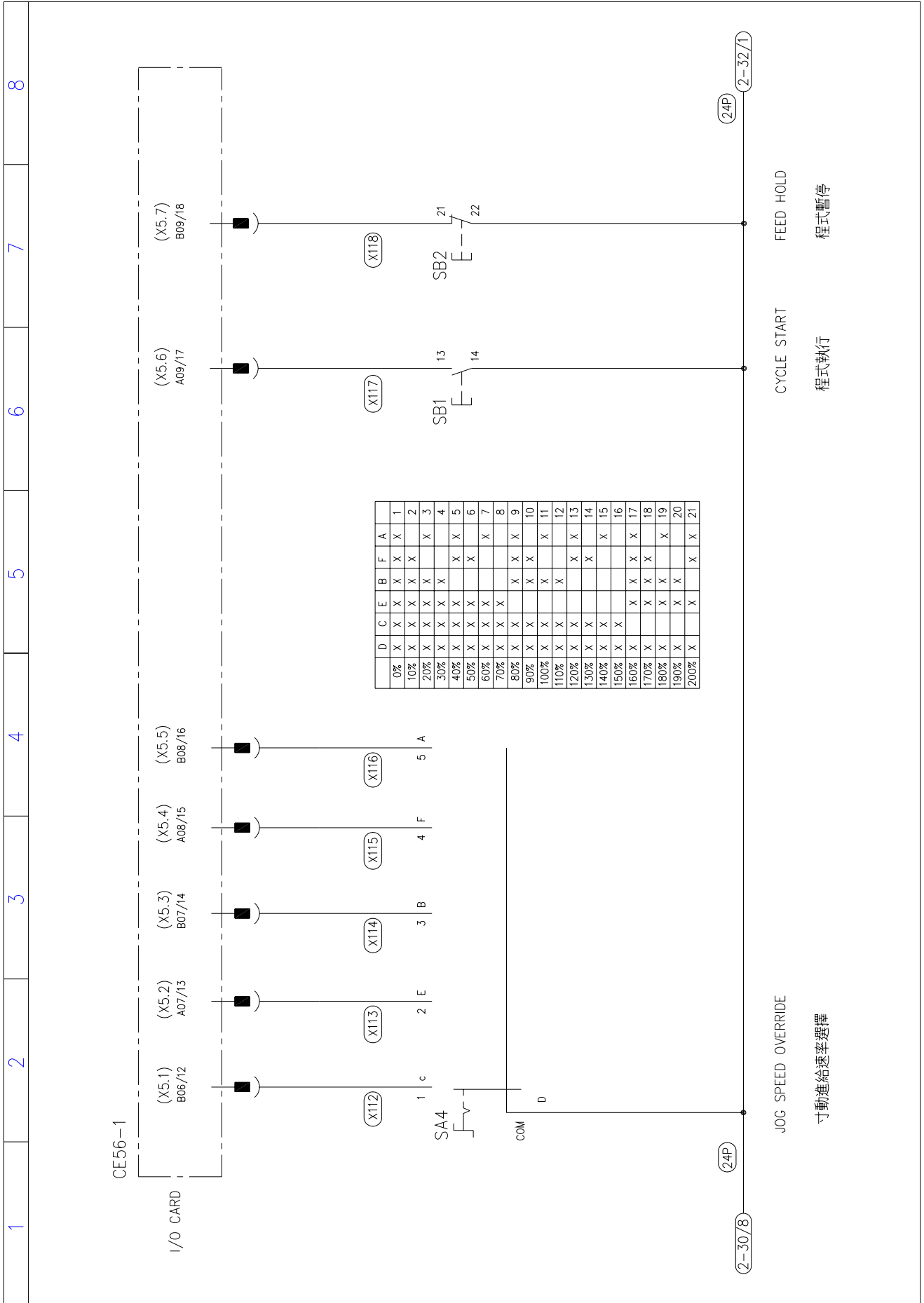
- MAGAZINE LOCK PIN IN/OUT (OPTION) 刀倉定位銷
- MAGAZINE ROTATION HIGH SPEED (OPTION) 刀倉旋轉(高檔)
- MAGAZINE ROTATION LOW SPEED (OPTION) 刀倉旋轉(低檔)
- M80 OUTPUT (M81 OFF) 第一組 預留 M CODE
- M82 OUTPUT (M83 OFF) 第二組 預留 M CODE
- M84 OUTPUT (M85 OFF) 第三組 預留 M CODE
- M85 OUTPUT (M86 OFF) 第四組 預留 M CODE
- AIR BLAST (OPTION) 側邊吹氣





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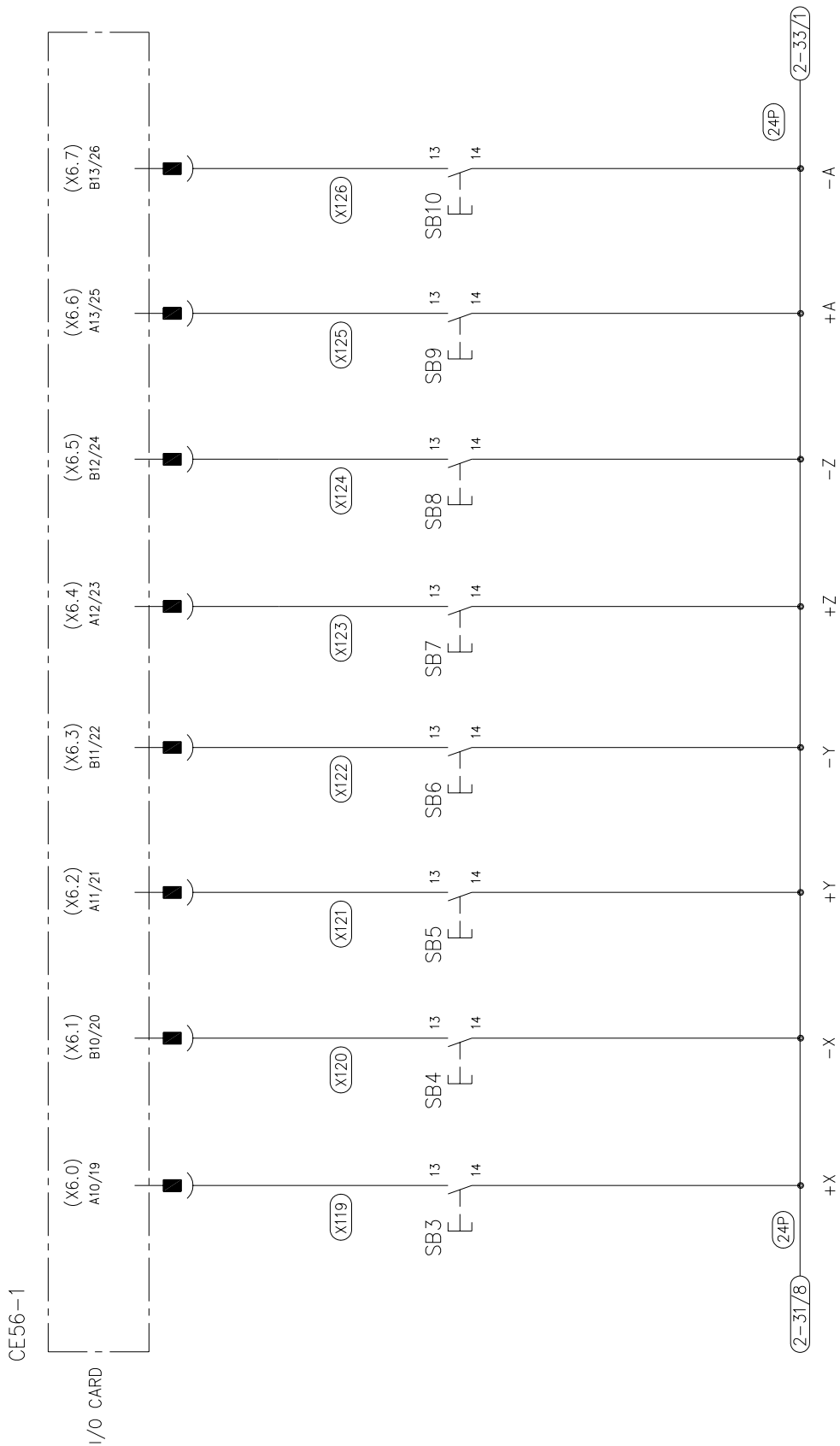
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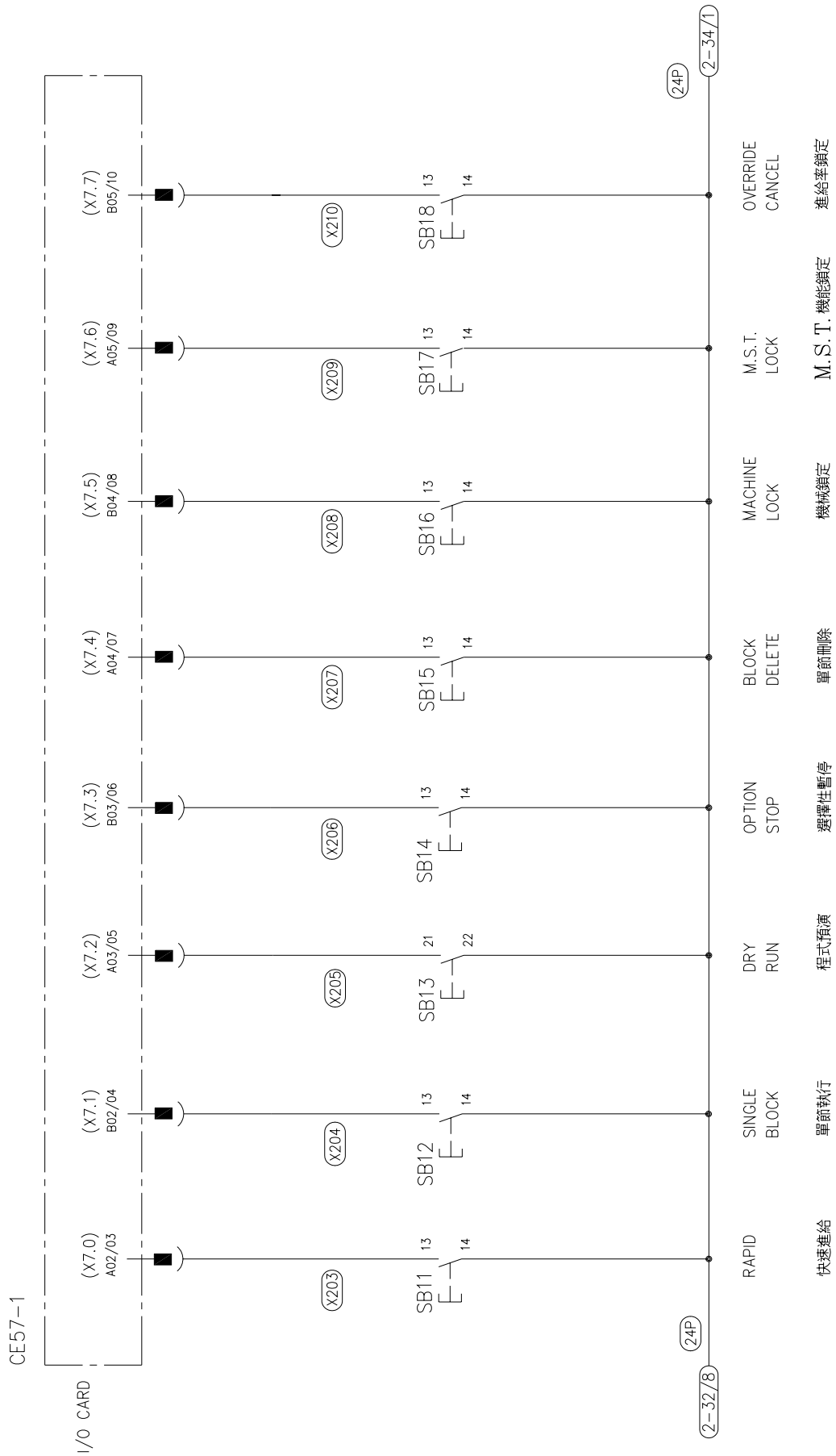
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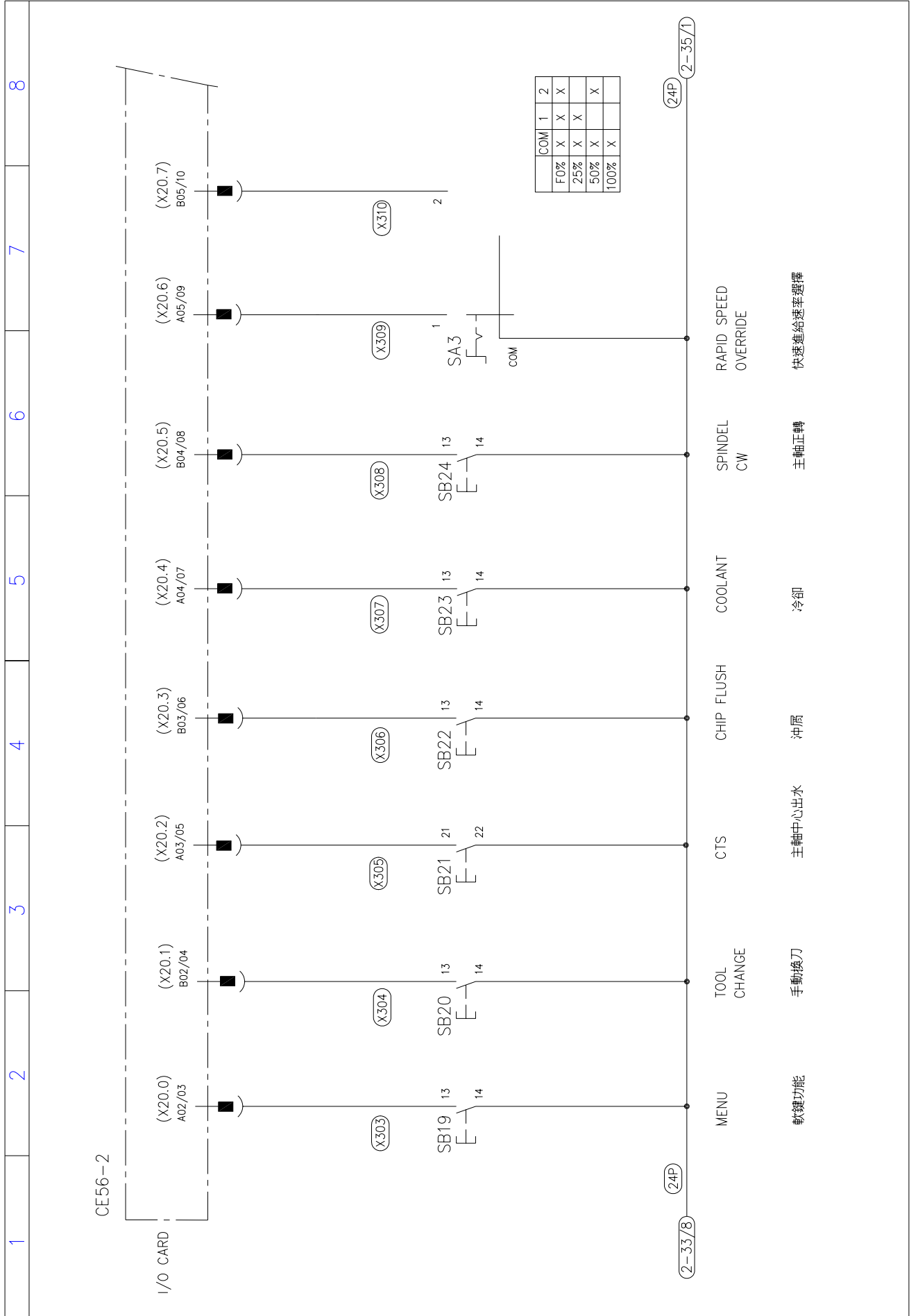
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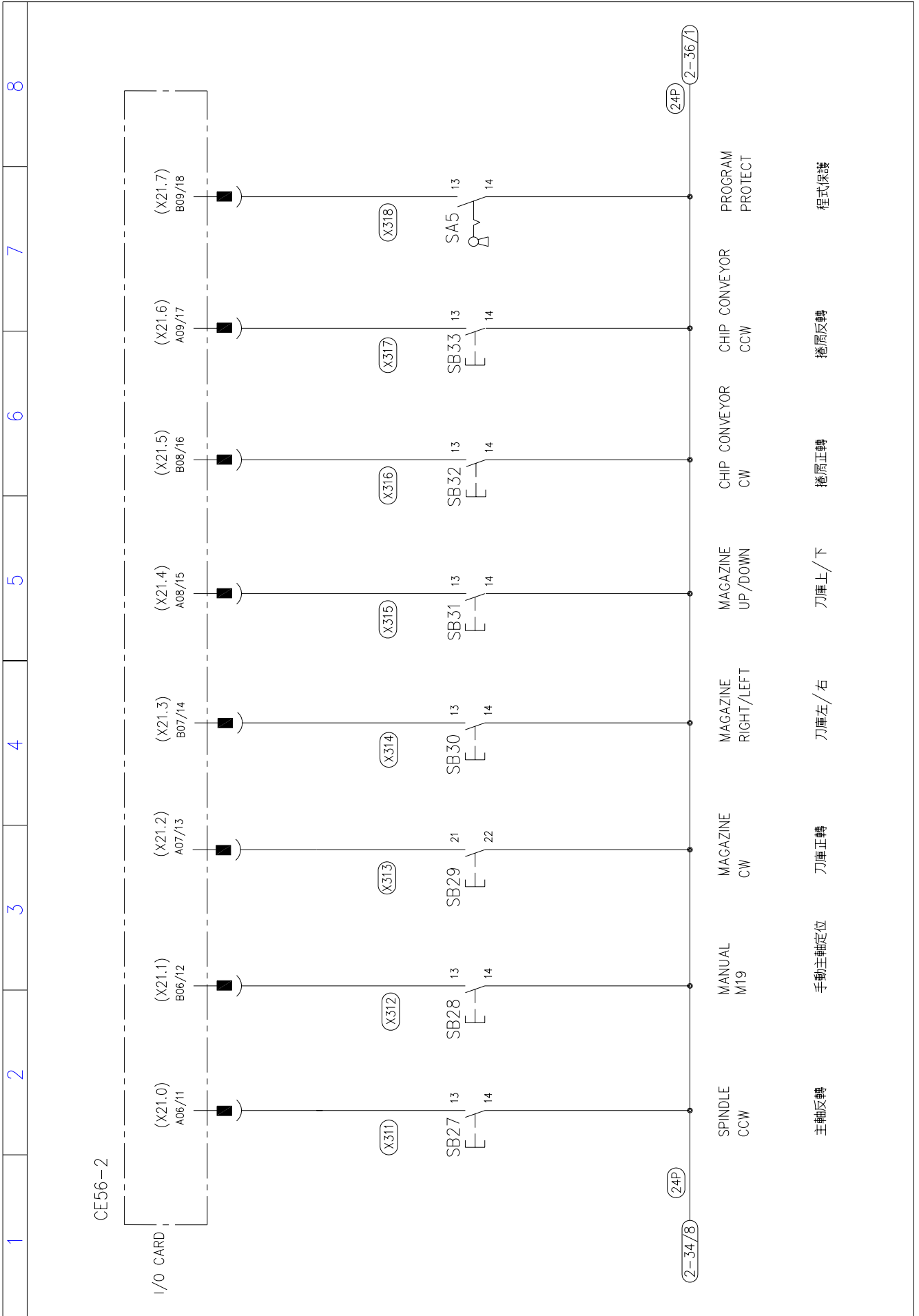
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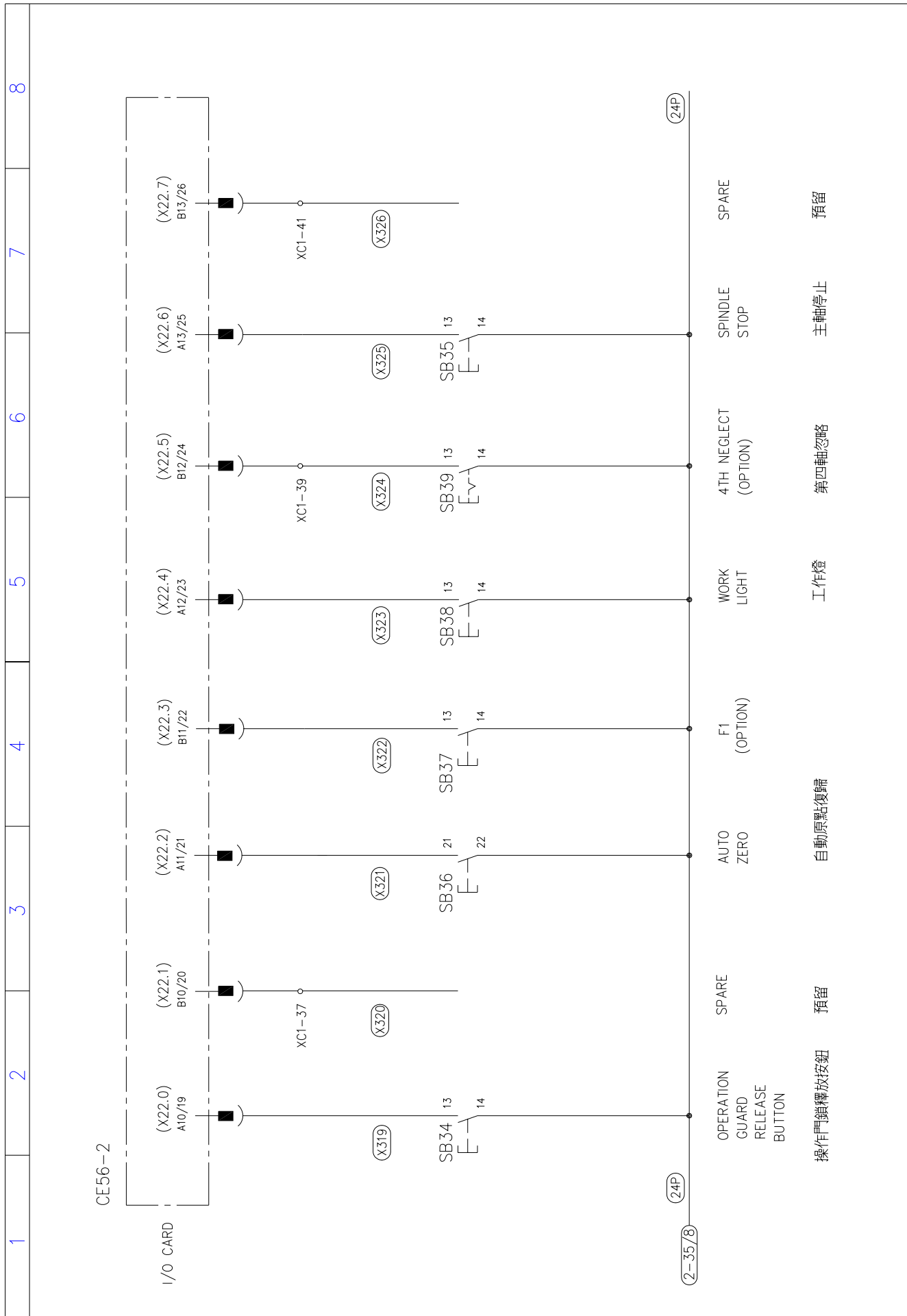
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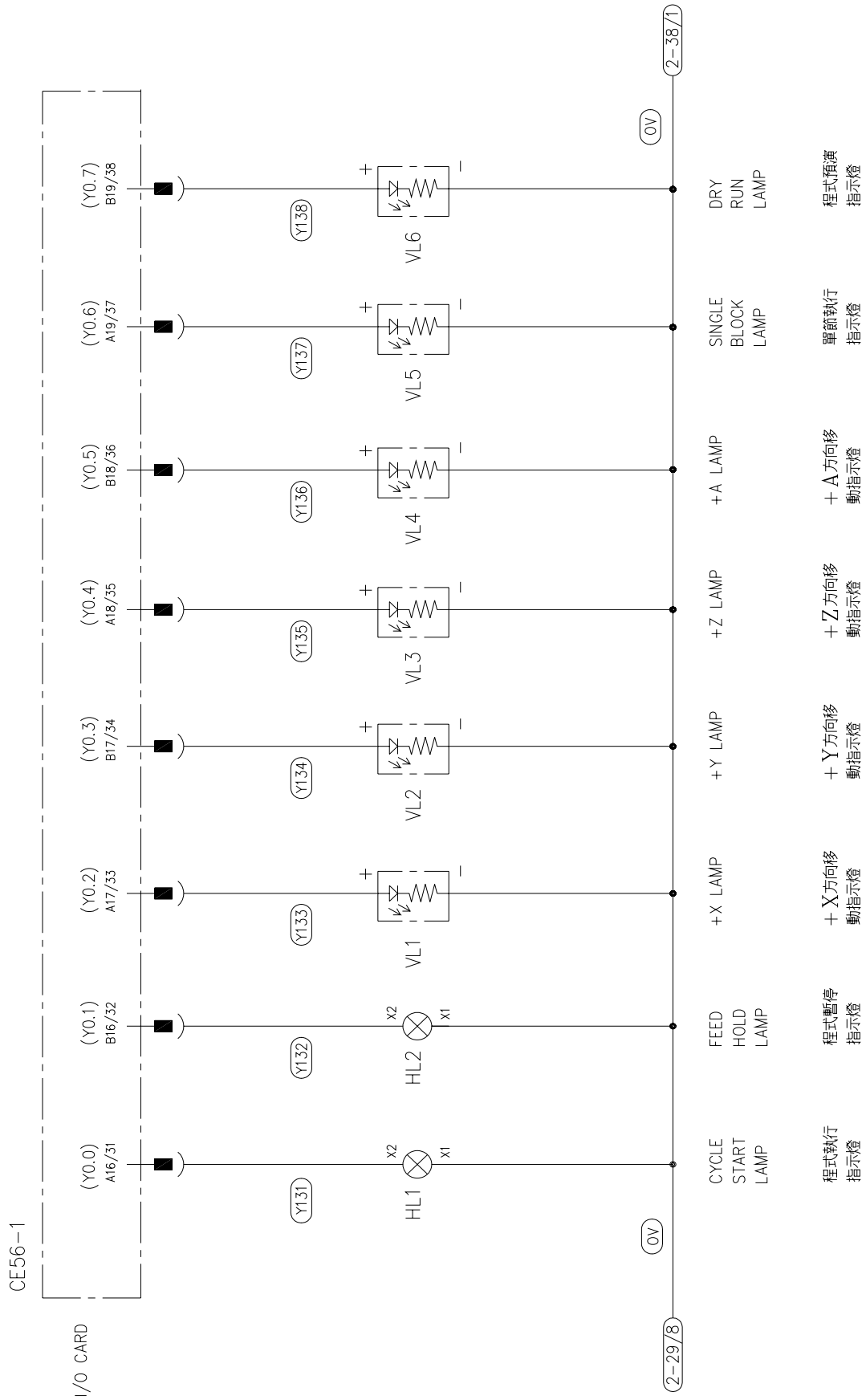






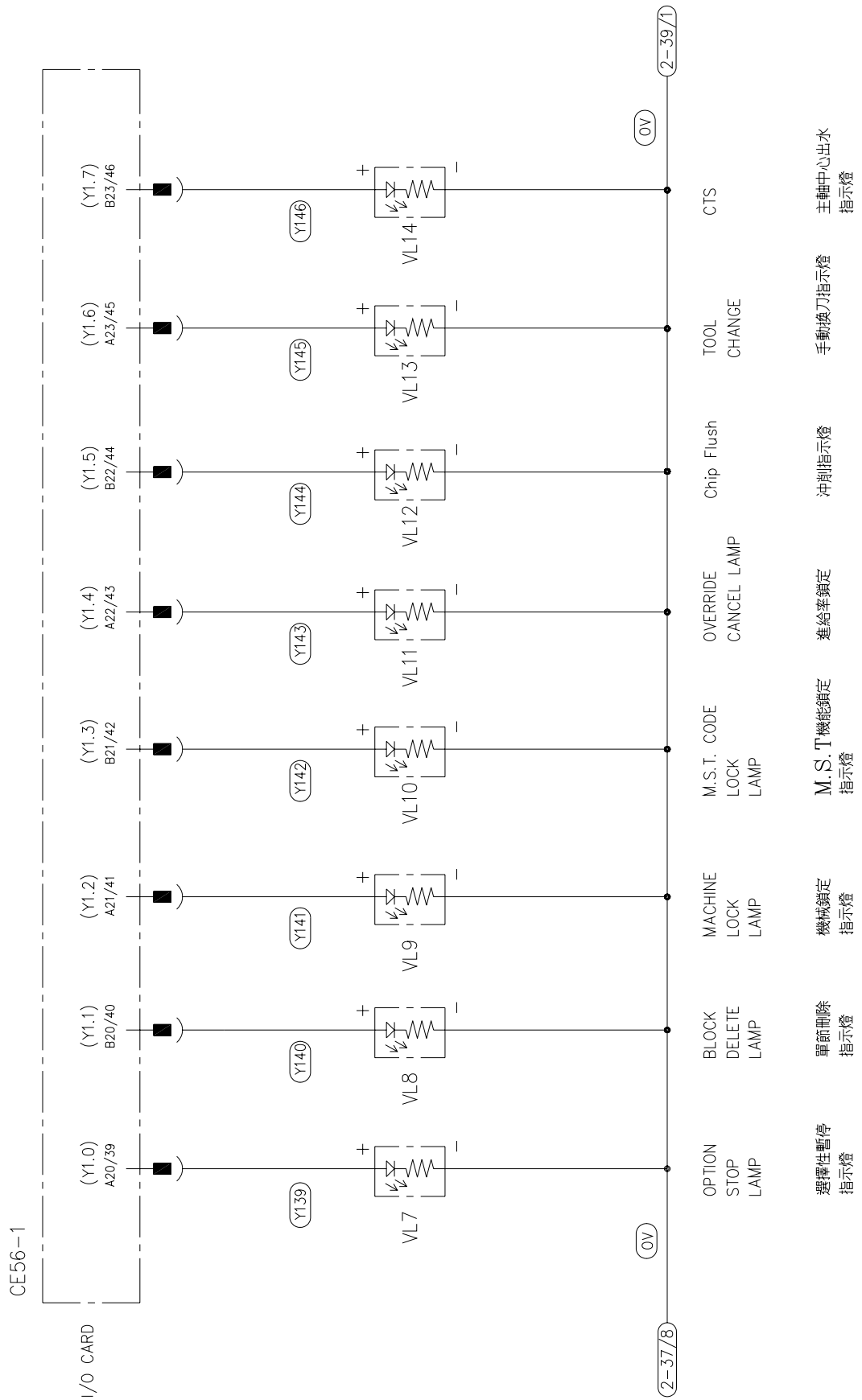


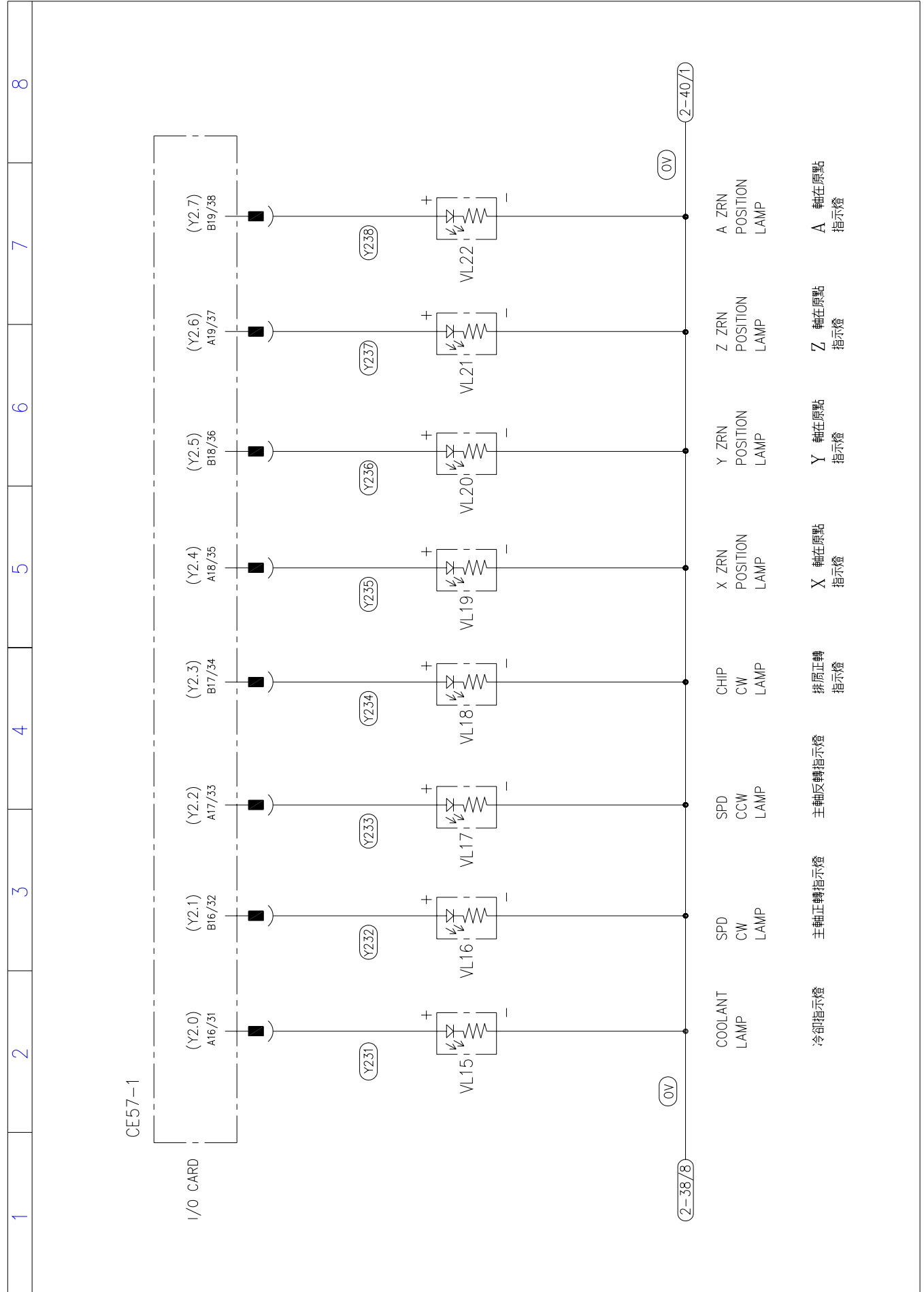
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1 2 3 4 5 6 7 8





8

7

6

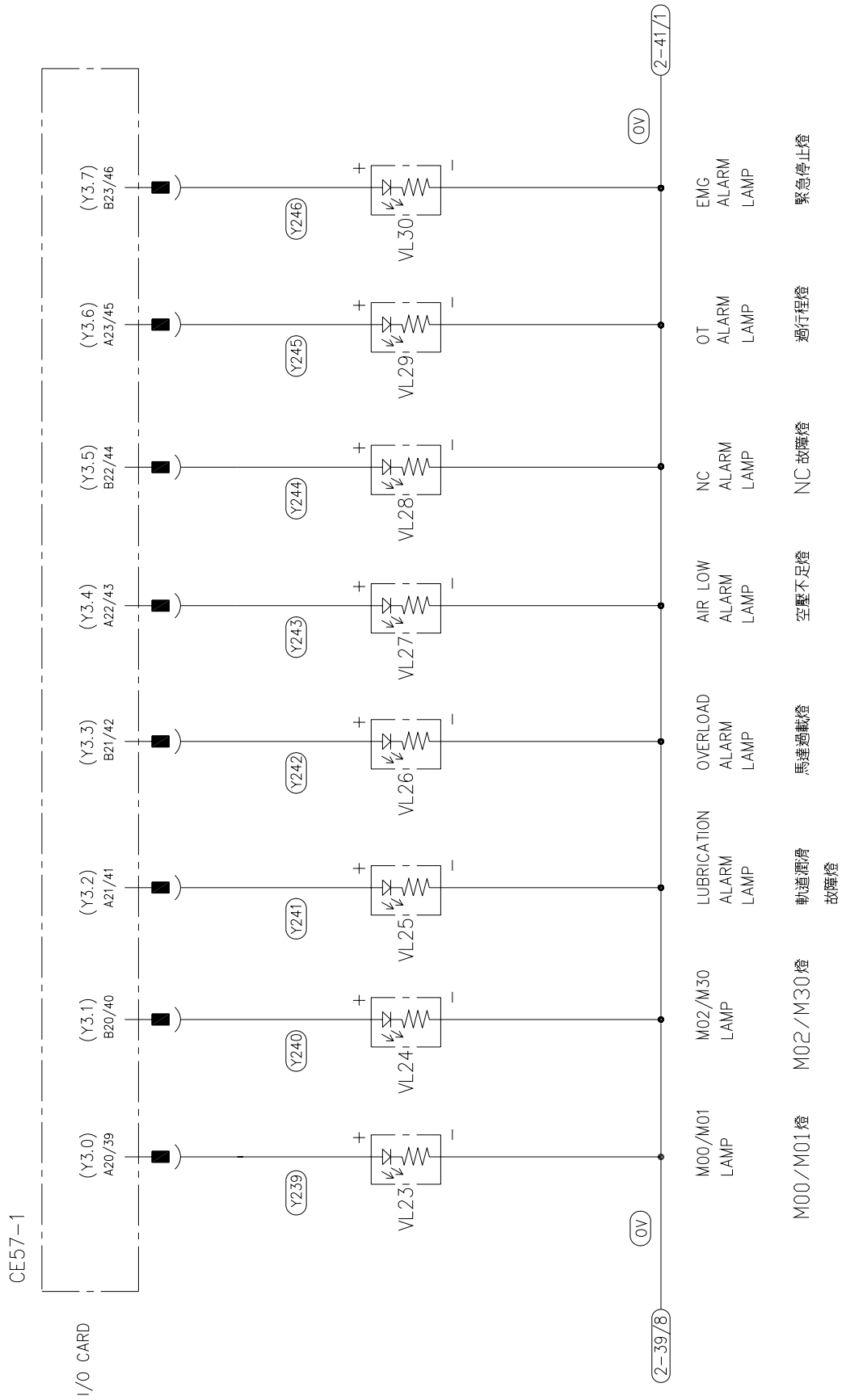
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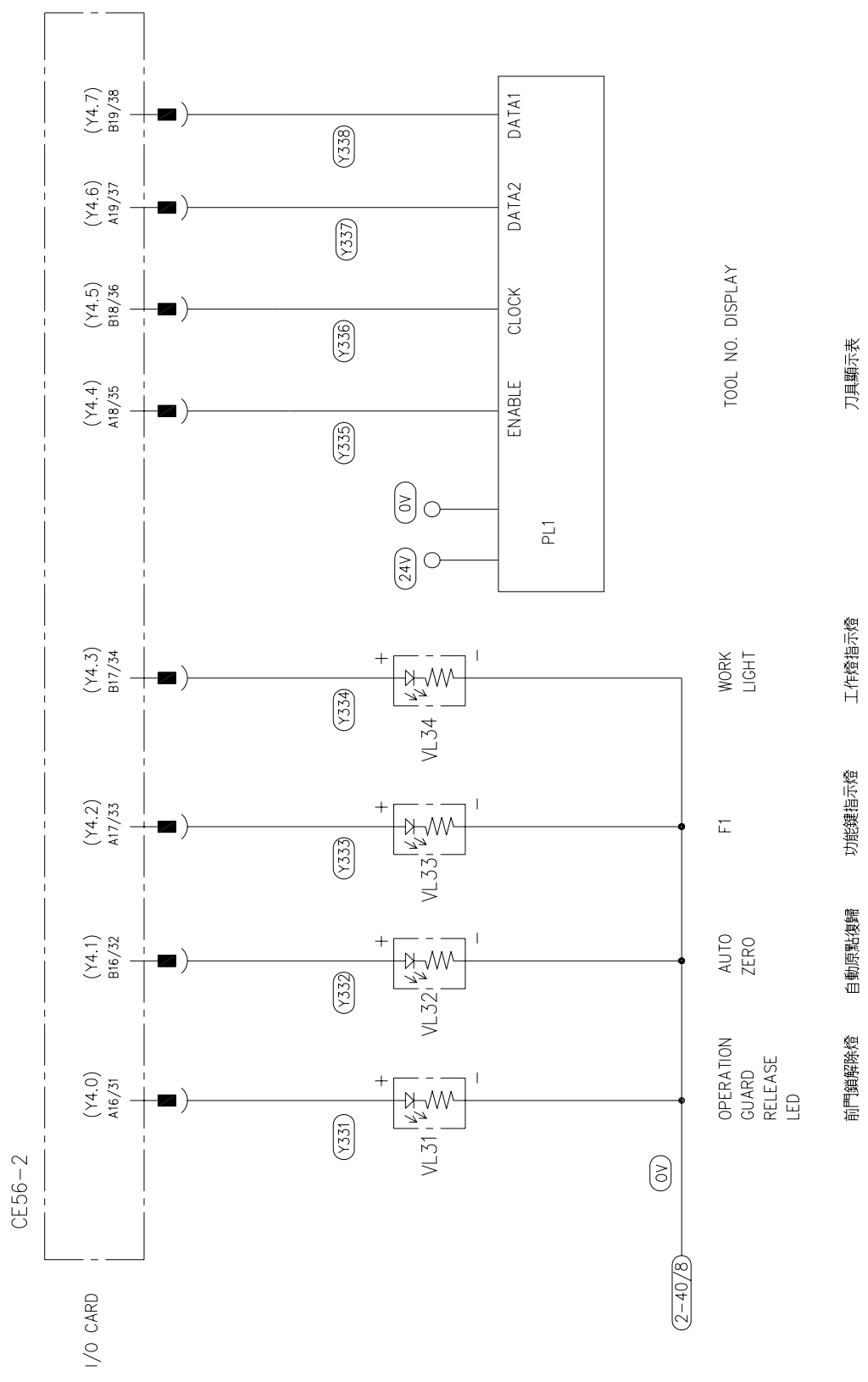
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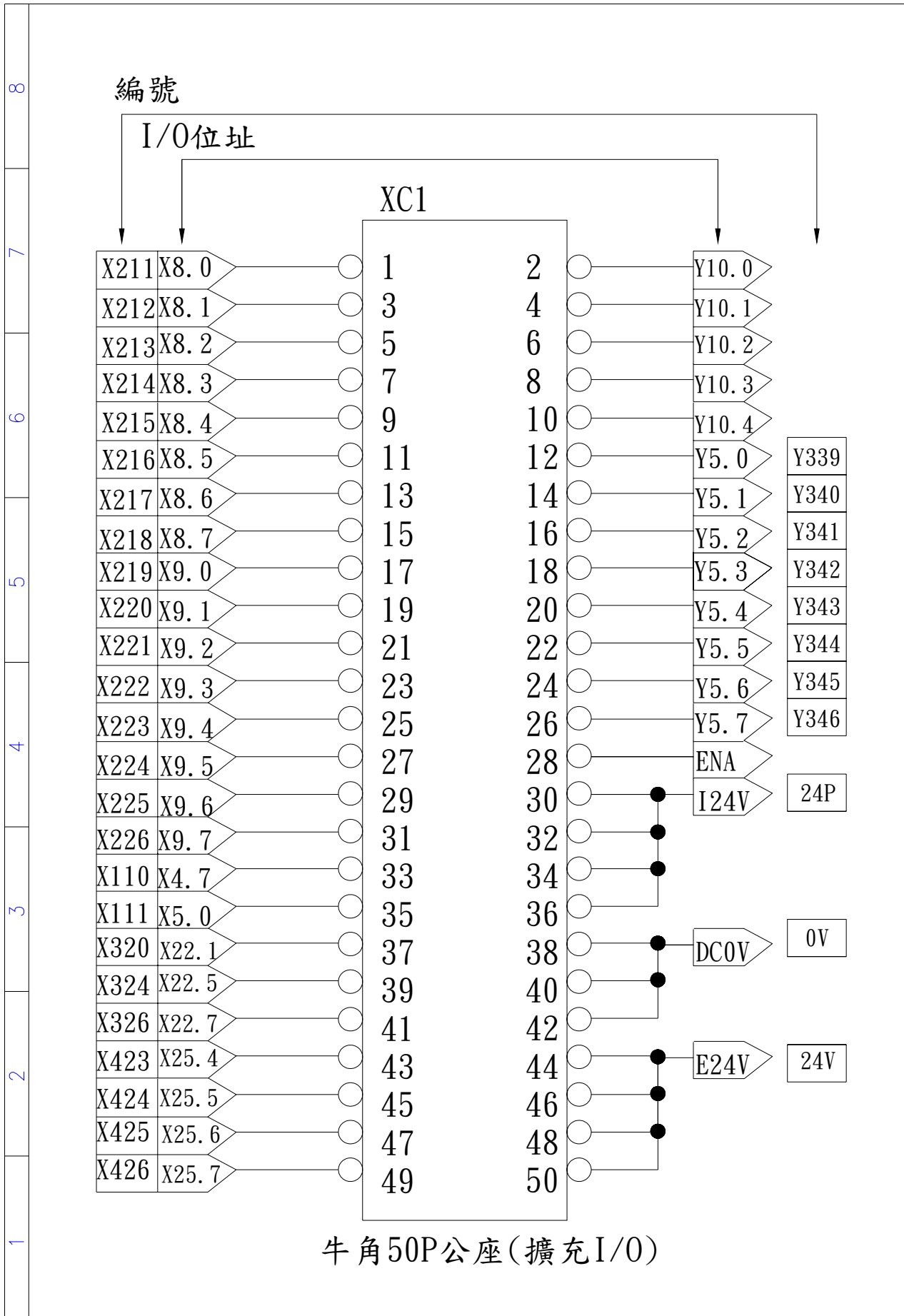
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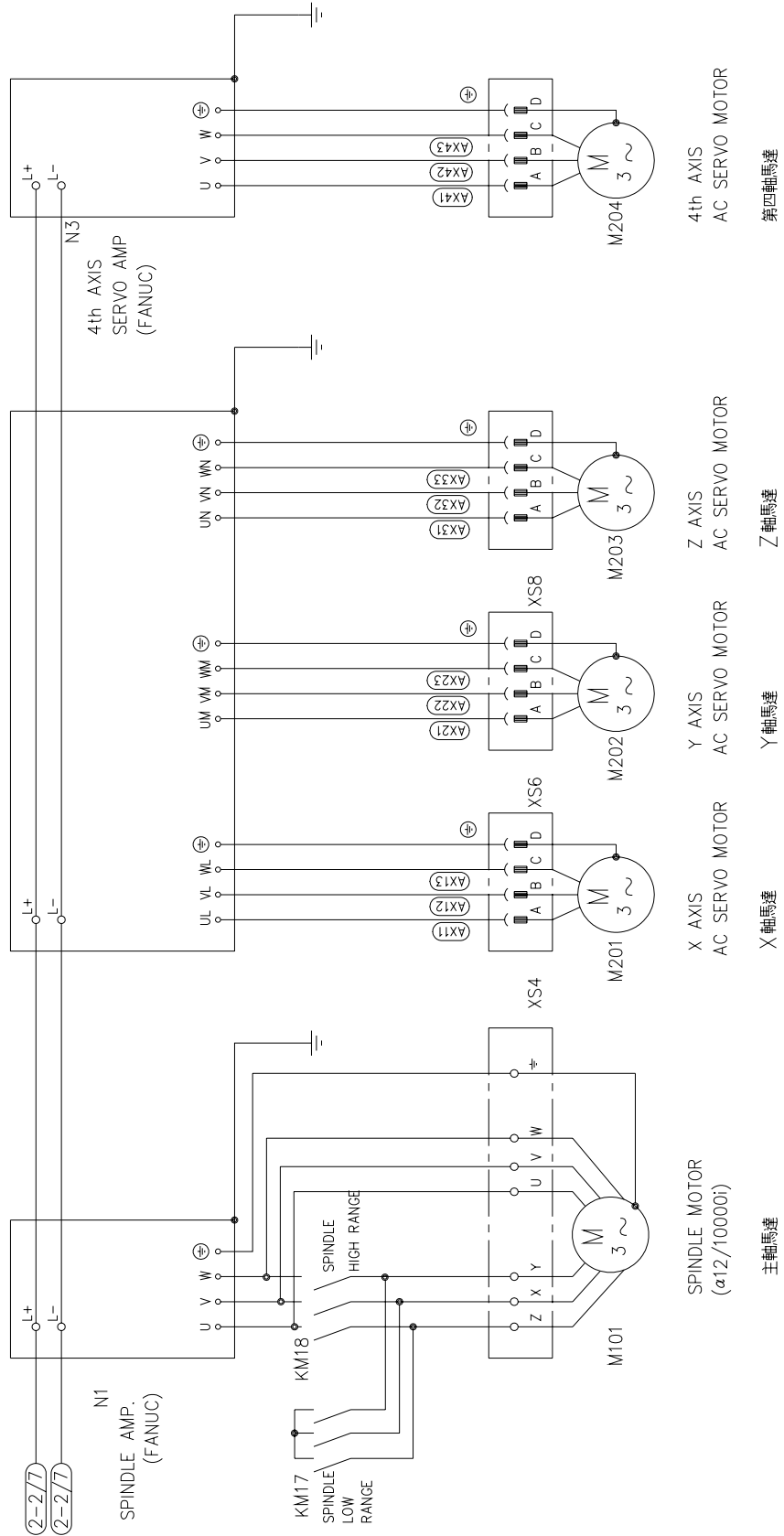
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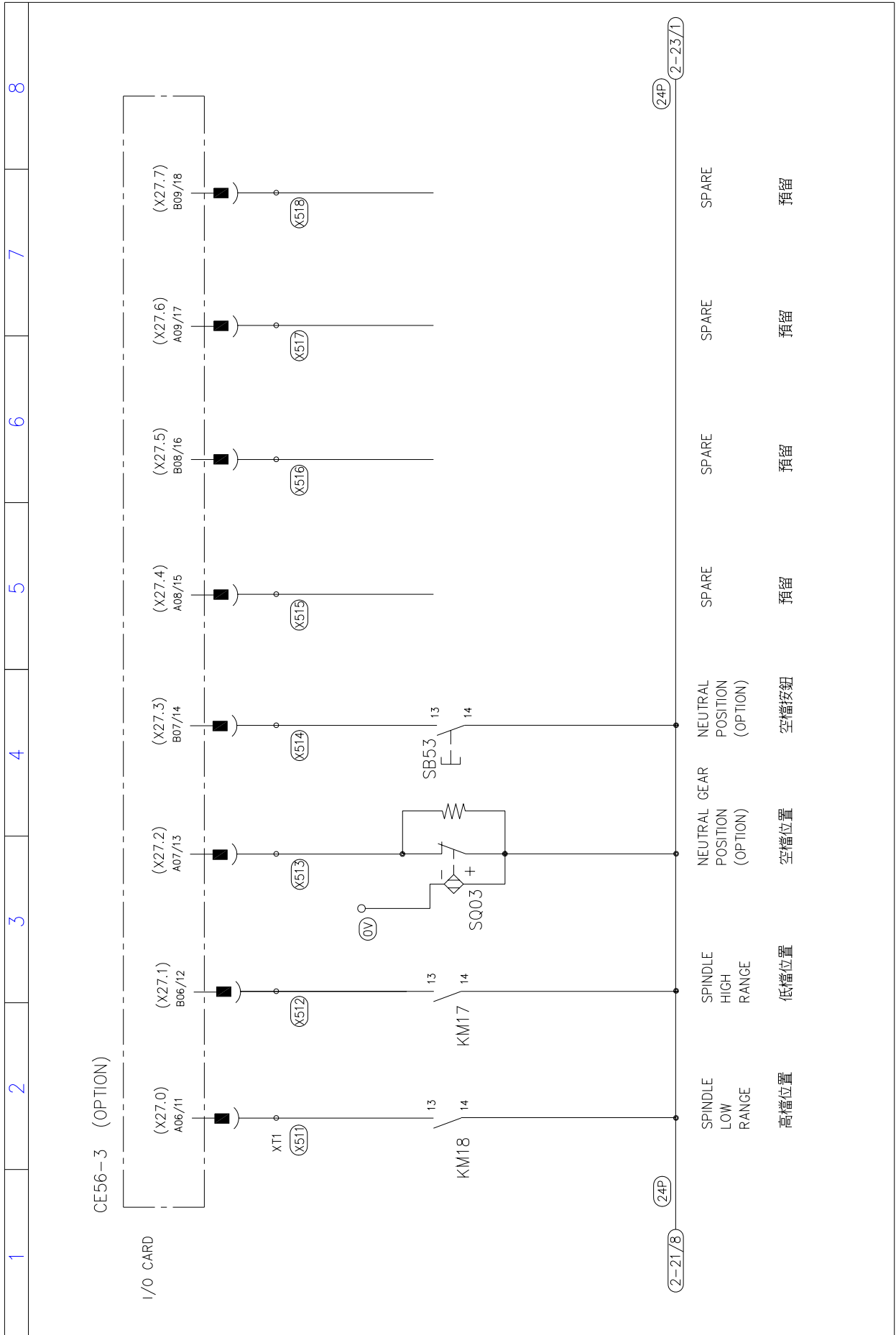


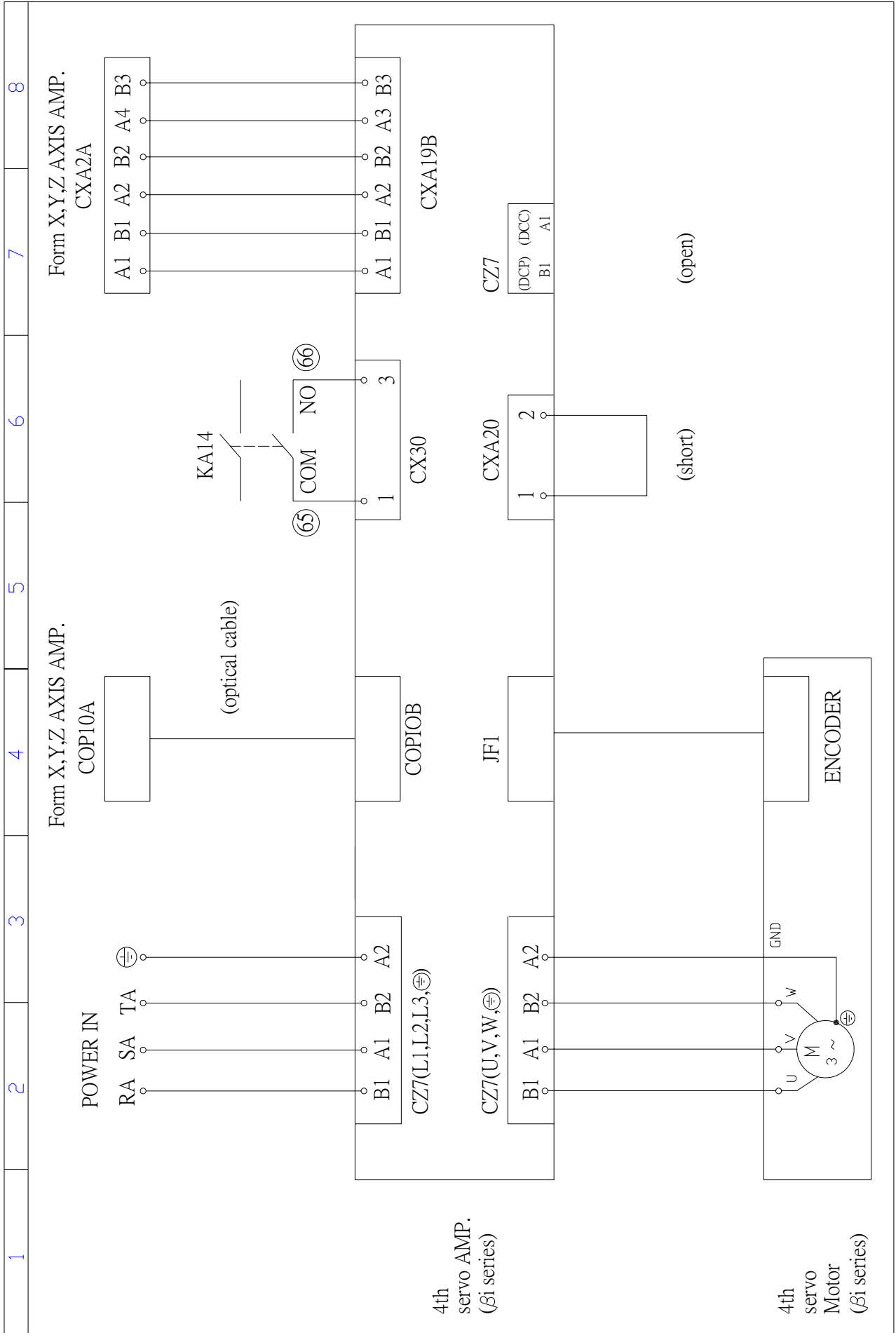


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1      2      3      4      5      6      7      8

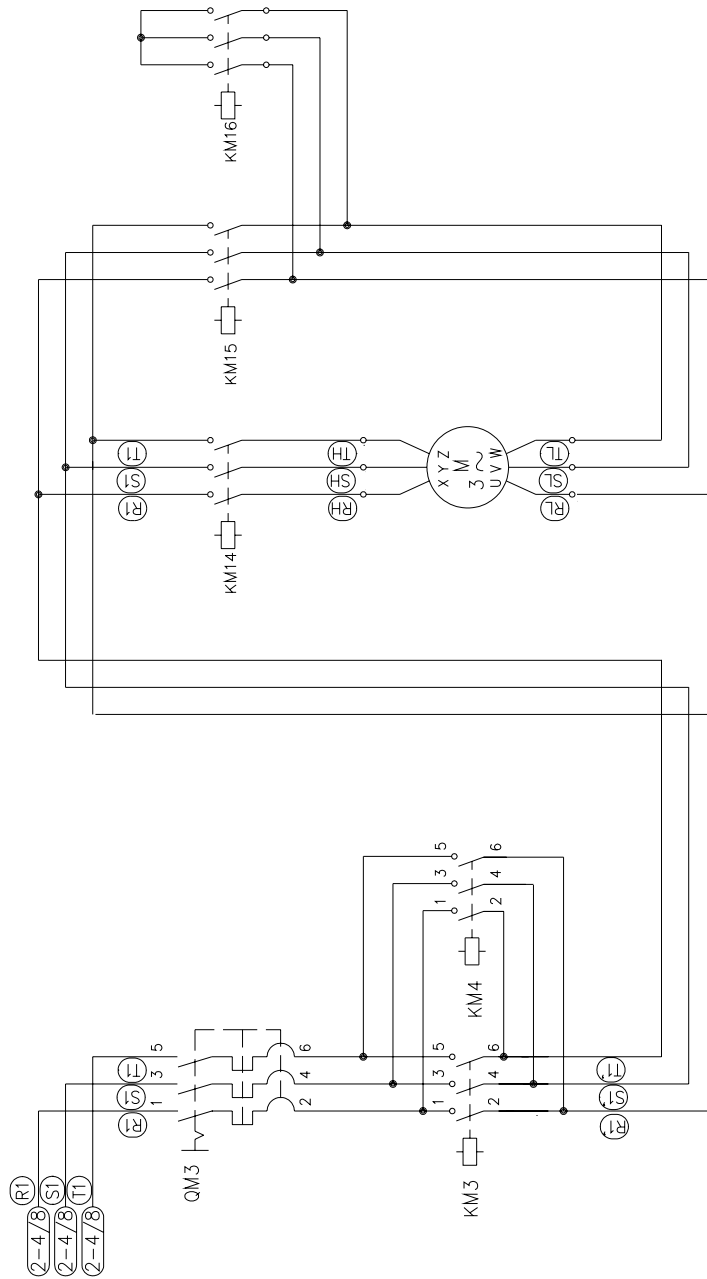








1 2 3 4 5 6 7 8



MAGAZINE  
CW/CCEW  
UNIT

刀倉正反轉

TRANSFORMER ( TV )				
ITEM DESIGNATION	DESCRIPTION AND FUNCTION	TECHNICAL DATA		SUPPLIER Item No
<b>TV 1</b>	MAIN POWER TRANSFORMER	INPUT : 380/415/440 V AC FREQ : 50 / 60 Hz OUTPUT : 200 / 220V AC / 20 KVA FREQ : 50 / 60 Hz	TAIWAN Suenn-Liang SP-TBSW-20KVA	
<b>TV 2</b>	CONTROL SYSTEM POWER TRANSFORMER	INPUT : 220 / 380 /440V AC FREQ. : 50 /60 Hz OOUTPUT : 24/100/110 AC 644VA	TAIWAN Suenn-Liang EB310644011 TBSW-644VA	
MOTOR ( M )				
ITEM DESIGNATION	DESCRIPTION AND FUNCTION	TECHNICAL DATA		SUPPLIER Item No
<b>M101</b>	SPINDLE MOTOR	WIND CONNECT: DELTA 3PH AMP. TEMP: 0 - 40 Deg. IEC60034-1 POWER FACTOR : 77% IP 54	MOTOR INPUT: 149-220V RATED OUTPUT : 5.5Kw 1500 - 6000 min <sup>-1</sup> 7.5 Kw 30 min	JAPAN Fanuc $\alpha 6$
			MOTOR INPUT: 149-220V RATED OUTPUT : 7.5 Kw 1500 - 6000 min <sup>-1</sup> 11 Kw 30 min	$\alpha 8$
			MOTOR INPUT: 161-220V RATED OUTPUT : 11 Kw 1500 - 6000 min <sup>-1</sup> 15 Kw 30 min	$\alpha 12$
<b>M201</b>	X AXIS AC SERVO MOTOR	OUTPUT: 1.0 Kw CONT. IEC60034-1	JAPAN Fanuc	
<b>M202</b>	Y AXIS AC SERVO MOTOR	RATED SPEED : 2000 min <sup>-1</sup>	$\alpha C12i / 2000$	

<b>M203</b>	Z AXIS AC SERVO MOTOR	OUTPUT: 3.0 Kw CONT. IEC60034-1 RATED SPEED : 2000 min <sup>-1</sup>	JAPAN Fanuc $\alpha$ C22iB/2000
<b>M204</b>	A AXIS AC SERVO MOTOR	IEC60034-1 RATED SPEED:2000min <sup>-1</sup>	JAPAN Fanuc $\alpha$ C3
<b>M02</b>	COOLANT PUMP	370W / 3 / 220(AC)/1.92A IP54 3 / 400 V AC/1.1A 50 / 60 Hz 2850 /2880 min <sup>-1</sup>	TAIWAN / GRUND FOS 1060-1006-500 SPK4-3
		3PH/200-255V/1.8-2.8A 550W 380-440V/1.2-1.4A	TAIEAN WALAUS TPK4r3-3
<b>M03</b>	MAGAZINE MOTOR	190W RAT: 1/20 220/380 V 50/60 Hz AMP 1.1/0.7 1420/1730 min <sup>-1</sup> IEC34-1 EN60034-1	TAIWAN Lung-Tang LT-15-01-(V) AEVF
<b>M05</b>	CHIP FLUSH	550W / 3 /220V/2.75A IP54 3 / 400V/1.58A 50 / 60 Hz 200-255 / 380-440 V 2830-2850 min <sup>-1</sup>	TAIWAN GRUNDFOS SPK4-5
		900W/3PH/200-255V/2.6-4.5A 380-440V/1.7-2.5A	TAIWAN WALAUS TPK4T5-5
<b>M07</b>	CHIP CONVEYOR MOTOR	190W 3PH 220/380V 50/60HZ 0.85/0.52A	TAIEAN FONGE
<b>M09</b>	MIST COOLANT PUMP	370W / 3 / 220(AC)/1.92A IP54 3 / 400 V AC/1.1A 50 / 60 Hz 2850 /2880 min <sup>-1</sup>	TAIWAN / GRUND FOS 1060-1006-500 SPK4-3
		3PH/200-255V/1.8-2.8A 550W 380-440V/1.2-1.4A	TAIEAN WALAUS TPK4r3-3
<b>M10</b>	COOLANT THROUGH SPINDLE MOTOR	3Kw 50Hz 220-240D / 380-415V 2900-3500 min <sup>-1</sup>	TW GRUNDFOS 1112MB2-28F T130-C CRK2-260/26A-W-A-AUUV

		3500 min <sup>-1</sup> p/ t 90bar Q 2.5m/h H 177.9 m IP54	C40ZA8025P10127
<b>M11</b>	RECYCLE COOLANT MOTOR	3X220-240/ 380-415 V~ Q 4m / h H 17 m 2.1 / 1.2 A IP54 Pt 6-10/90-40 bar	GB GRUNDFOS CH4-20 A-A-CVBV H4551102 P29823
<b>M12</b>	LUBRICATION PUMP	CAPACITY : 4.6 L MAX. PRESSURE: 2-15 Kg/cm FLOW RATE: 0.6L / min <sup>-1</sup> VOLT: 200/220 V AC/25W 50/60 Hz	TAIWAN Chen-Ying CEVB-II
<b>M13</b>	ATC MOTOR	IEC34-1 EN60034-1 3/400W / 220/380V / 50/60HZ	TAIWAN Lung-Tang

#### CONTACTOR ( KM )

ITEM DESIGNATION	DESCRIPTION AND FUNCTION	TECHNICAL DATA	SUPPLIER Item No
<b>KM00</b>	CONTROL SYSTEM READY	3a + 1a1b AC3 : 65A 440 VAC	FRANCE Telemecanique LC1D50B7
<b>KM01</b>		IEC/EN 60947 VDE 0660	
<b>KM02</b>	COOLANT PUMP	3a + 1a1b	FRANCE Telemecanique LC1 D096 B7
<b>KM03</b>	MAGAZINE MOTOR CW	Ith:25A 600VAC IEC/EN 60947	
<b>KM04</b>	MAGAZINE MOTOR CCW	VDE 0660	
<b>KM05</b>	CHIP FLUSH MOTOR		
<b>KM06</b>	TAPPING OIL PUMP		

<b>KM07</b>	CHIP CONVEYER MOTOR CW	3a + 1a1b Ith:25A	FRANCE Telemecanique
<b>KM08</b>	CHIP CONVEYOR MOTOR CCW	600VAC IEC/EN 60947 VDE 0660	LC1 D096 B7
<b>KM09</b>	MIST COOLANT PUMP		
<b>KM10</b>	COOLANT THROUGH SPINDLE PUMP	3a + 1a1b 600VAC IEC/EN 60947 VDE0660	FRANCE Telemecanique LC1 D126 B7
<b>KM12</b>	LUBRICATION PUMP	3a + 1a1b Ith : 25A 600VAC IEC/EN 60947	FRANCE Telemecanique LC1 D096 B7
<b>KM13</b>	ATC MOTOR	VDE 0660	
<b>KM17</b>	SPINDLE LOW RANGE	3a + 1a1b AC3 : 65A	FRANCE Telemecanique
<b>KM18</b>	SPINDLE HIGH RANGE	440 VAC IEC/EN 60947 VDE 0660	LC1D50B7

#### MOTOR PROTECTION SWITCH ( QM )

<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>QM01</b>	SPINDLE COOLER	3/220V 50/60HZ HB0-250PTSB3-1	TAIEAN HABOR
<b>QM02</b>	COOLANT PUMP	2.5 – 4A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0113	FRANCE Telemecanique GV2 - ME08
<b>QM03</b>	MAGAZINE MOTOR	1 - 1.6 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0113	FRANCE Telemecanique GV2 - ME06

<b>QM05</b>	CHIP FLUSH PUMP	2.5 – 4 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0113	FRANCE Telemecanique GV2 - ME08
<b>QM06</b>	TAPPING OIL PUMP	2.5 – 4 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 – ME08
<b>QM07</b>	CHIP CONVEYOR MOTOR	0.63 - 1 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 - ME05
<b>QM09</b>	MIST COOLANT PUMP	1 – 1.6 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 - ME06
<b>QM10</b>	COOLANT THROUGH SPINDLE PUMP	13-18 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 – ME20
<b>QM11</b>	RECYCLE COOLANT PUMP	1.6 - 2.5 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 - ME07
<b>QM12</b>	LUBRICATION PUMP	0.25 - 0.4 A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 - ME03
<b>QM13</b>	ATC MOTOR	1.6A-2.5A IEC/EN60947-2 IEC/EN60947-4-1 VDE0660.0111	FRANCE Telemecanique GV2 - ME07



<b>NO FUSE BREAKER ( QF )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>QF01</b>	TRANSFORMER INPUT	IEC/EN60947 VDE0660	Moeller NZM4-63
<b>QF02</b>	TRANSFORMER OUTPUT	IEC/EN60947 VDE0660	Moeller NZM7-80N
<b>QF03</b>	FANUC MASTER AND POWER SUPPLY	230 / 400 V AC 6 A	GERMANY Moeller FAZ-S6
<b>QF04</b>	EXHAUST FAN	230 / 400 V AC 2 A IEC/EN60947 VDE0660	GERMANY Moeller FAZ-S2
<b>QF5</b>	SPINDLE MOTOR FAN	230 / 400 V AC 0.5 A IEC/EN60947 VDE0660	GERMANY Moeller PKZM0-0.63
<b>QF06</b>	TV2 INPUT	230 / 400 V AC 4 A	GERMANY Moeller
<b>QF07</b>	WORK LIGHT	IEC/EN60947 VDE0660	FAZN-S4
<b>QF08</b>	AC 24V CONTROL CIRCUIT		
<b>QF09</b>	INDICATION LAMP	230 / 400 V AC 2 A	GERMANY Moeller
<b>QF11</b>	AC 110V CONTROL CIRCUIT	IEC/EN60947 VDE0660	FAZ-S2

<b>MAGNETIC CONECTOR RELAY ( KA )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>KA01</b>	MACHINE READY	1.24V DC	JAPAN
<b>KA02</b>	COOLANT PUMP	5A 250V~ AC	Omron
		2.3A 30V DC	MY2J
<b>KA03</b>	LUBRICATION PUMP	7A 1/6 HP	JAPAN
		125,250V AC	National
<b>KA04</b>	MAGAZINE MOTOR CW		NAis
			HC2-H-DC24V
<b>KA05</b>	MAGAZINE MOTOR CCW		AP3222K
<b>KA06</b>	MAGAZINE BRAKE / ATC MOTOR BRAKE		
<b>KA07</b>	MAGAZINE FORWARD/BACKWA RD. / MAGAZINE POCKET TO VERTICAL		
<b>KA08</b>	MAGAZINE UP/DOWN / MAGAZINE POCKET TO HORIZON TAL		
<b>KA09</b>	TOOL UNCLAMP & AIR BLOW		
<b>KA10</b>	PROGRAM FINISH		
<b>KA11</b>	OVER TRAVEL EMERGENCY STOP		
<b>KA12</b>	EMERGENCY STOP		
<b>KA13</b>	BUZZER		
<b>KA14</b>	NC STOP		
<b>KA15</b>	AUTO POWER OFF		
<b>KA16</b>	TAPPING OIL PUMP		



<b>KA17</b>	OPERATION GUARDRELEASE		
<b>KA21</b>	ALARM LIGHT		
<b>KA22</b>	CYCLE LIGHT		
<b>KA23</b>	ARM MOTOR		
<b>KA24</b>	CHIP FLUSH PUMP		
<b>KA26</b>	COOLANT THROUGH SPINDLE		
<b>KA27</b>	M50 th-AXIS CLAMP		
<b>KA28</b>	RECYCLE COOLANT PUMP		
<b>KA29</b>	CHIP CONVEYOR CW		
<b>KA30</b>	CHIP CONVEYOR CCW		
<b>KA31</b>	SPINDLE ROTATE AIR BLOW		
<b>KA32</b>	AIR BLAST		
<b>KA33</b>	WORK LAMP		
<b>KA34</b>	NC POWER		
<b>KA35</b>	MAG DOOR OPEN		
<b>KA36</b>	SPINDLE GEAR HIGH		
<b>KA37</b>	SPINDLE GEAR LOW		
<b>KA38</b>	SPINDLE GEAR HIGH / NEUTRAL		
<b>KA39</b>	SPINDLE GEAR LOW / NEUTRAL		
<b>KA49</b>	EMERZNCY STOP AUX RELAY1		

<b>KA50</b>	EMERGENCY STOP AUX RELAY2		
<b>SELECT SWITCH ( SA )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>SA01</b>	MODE SELECTOR	25 VDC 0.05A EN61010-1	JAPAN TOSOKU DPN-01-N
<b>SA02</b>	SPINDLE OVERRIDE	25 VDC 0.05A EN61010-1	JAPAN TOSOKU DPN-02-N
<b>SA03</b>	RAPID OVERRIDE	25 VDC 0.05A EN61010-1	JAPAN TOSOKU 4N-1-2-5-BP30
<b>SA04</b>	JOG OVERRIDE	25 VDC 0.05A EN61010-1	JAPAN TOSOKU DPN-02-J
<b>SA05</b>	PROGRAM PROTECT & ENAGLE OPERATING MODE	AC250V VDE0660	JAPAN FUJI AH164-J3A22
<b>SA06</b>	AXES SELECTOR (REMOTE MPG)	25 VDC 0.05A EN61010-1	JAPAN TOSOKU 4N-1-2-5-BP30
<b>SA07</b>	HANDLE FEED (REMOTE MPG)		

<b>PUSH BUTTON ( SB )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>SB01</b>	CYCLE START	61-1150.0+61-8410.12 VDE. 	Eao SWISS
<b>SB02</b>	FEED HOLD	61-1150.0+61-8440.12 VDE. 	
<b>SB03</b>	+X	LC - 0IMATE-B 0I-MB	TAIWAN FUTURE
<b>SB04</b>	-X		
<b>SB05</b>	+Y		
<b>SB06</b>	-Y		
<b>SB07</b>	+Z		
<b>SB08</b>	-Z		
<b>SB09</b>	+A		
<b>SB10</b>	-A		
<b>SB11</b>	RAPID		
<b>SB12</b>	SINGLE BLOCK		
<b>SB13</b>	DRY RUN		
<b>SB14</b>	OPTION STOP		
<b>SB15</b>	BLOCK DELETE		
<b>SB16</b>	MACHINE LOCK		
<b>SB17</b>	M.S.T. LOSK		
<b>SB18</b>	OVERRIDE CANCEL		
<b>SB19</b>	MENU		
<b>SB20</b>	TOOL CHANGE		
<b>SB21</b>	CTS ON/OFF		
<b>SB22</b>	CHIP FLUSH ON/OFF		
<b>SB23</b>	COOLANT ON/OFF		
<b>SB24</b>	SPINDLE CW		
<b>SB25</b>	OT RELEASE		

<b>SB26</b>	PERMISSIVE BUTTON 1		
<b>SB27</b>	SPINDLE CCW		
<b>SB28</b>	MANUAL M19		
<b>SB29</b>	MAGAZINE CW		
<b>SB30</b>	MAG RIGHT/LEFT		
<b>SB31</b>	MAG UP/DOWN		
<b>SB32</b>	CHIP CONVEYOR CW		
<b>SB33</b>	CHIP CONVEYOR CCW		
<b>SB34</b>	SPINDLE INTERLOCK		
<b>SB35</b>	SPINDLE STOP		
<b>SB36</b>	AUTO ZERO		
<b>SB37</b>	F1(OPTION)		
<b>SB38</b>	WORK LIGHT		
<b>SB39</b>	4 <sup>TH</sup> AXIS NEGLECT		
<b>SB40</b>	TOOL UNCLAMP	AC15:240V 3A	FRANCE
<b>SB41</b>	MANUAL SPINDLE NEUTRAL	IEC/EN60947-5-1	Telemecanique ZB4-BA1 ZB4 BZ101
<b>SB42</b>	MANUAL MAG CW		
<b>SB43</b>	MANUAL MAG CCW		
<b>SB44</b>	PERMISSIVE BUTTON 2		
<b>SB45</b>	MANUAL LUBRICATION	BELONG TO LUBRICATION SYSTEM	TAIWAN Chen-Ying
<b>SB46</b>	EMG PANEL	AC15:240V 3A	IEC/EN60947-5-1 T.E
<b>SB47</b>	EMG MAGAZINE		FRANCE Telemecanique
<b>SB48</b>	EMG CONVEYOR CHIP		ZB4-BZ102
<b>SB49</b>	EMG MPG	U'L CSA CE	JAPAN FUJI AH-165V
<b>SB51</b>	NC POWER ON	6 / 250 V without push lock	TE. ZB5 AA4 IEC/EN60947-5-1

<b>SB52</b>	NC POWER OFF	6 / 250 V without push lock	SWISS EAO 61-1130.0
<b>SB53</b>	NE UTRAL POSITION		
<b>SB54</b>	MAGAZINE CCW		
<b>SB55</b>	OPERATION GUARD RELEASE		
<b>SB56</b>	CONTROL ON		
<b>SB57</b>	SUFT KEY ENABLE by HARD KEY	UL CSA CE	
<b>SB58</b>	5th +	LC-0iMATE-B	TAIWAN FUTURE
<b>SB59</b>	5th -	0i-MB	
<b>SB60</b>	MAGAZINE GUARD RELEASE	AC15:240V3A EN60947-S-1	FRANCE Telemecanique ZB4-BA1 ZB4-BZ101

#### INDICATOR LAMP ( HL )

<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>HL 1</b>	CYCLE START	LAMP MAX. 60 V / 1.2 W	SWISS Eao
<b>HL 2</b>	FEED HOLD		

#### INDICATOR LED ( VL )

<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>VL01</b>	+X LAMP	LC-0iMATE-B 0i-MB	TAIWAN FUTURE
<b>VL02</b>	+Y LAMP		
<b>VL03</b>	+Z LAMP		
<b>VL04</b>	+A LAMP		
<b>VL05</b>	SINGLE BLOCK		
<b>VL06</b>	DRY RUN		
<b>VL07</b>	OPTION STOP		

<b>VL08</b>	BLOCK DELETE		
<b>VL09</b>	MACHINE LOCK		
<b>VL10</b>	MOST LOCK M.S.T.		
<b>VL11</b>	OVERRIDE CANCEL		
<b>VL12</b>	MENU		
<b>VL13</b>	TOOLCHANGE		
<b>VL14</b>	CTS1		
<b>VL15</b>	COOLANT ON/OFF		
<b>VL16</b>	SPINDLE CW		
<b>VL17</b>	SPINDLE CCW		
<b>VL18</b>	CHIP CONVEYOR CW		
<b>VL19</b>	X ZRN POSITION		
<b>VL20</b>	Y ZRN POSITION		
<b>VL21</b>	Z ZRN POSITION		
<b>VL22</b>	A ZRN POSITION		
<b>VL23</b>	M00/M01		
<b>VL24</b>	M02/M30		
<b>VL25</b>	LUBRICATION ALARM		
<b>VL26</b>	OVERLOAD ALARM		
<b>VL27</b>	AIR LOW ALARM		
<b>VL28</b>	NC ALARM		
<b>VL29</b>	OT ALARM		
<b>VL30</b>	EMG ALARM		
<b>VL31</b>	SPINDLE OVERRIDE INTERLOCK		
<b>VL32</b>	AUTO ZERO		
<b>VL33</b>	F1		
<b>VL34</b>	WORK LIGHT		
<b>VL35</b>	CHIP CONVEROR CCW		
<b>VL36</b>	MAGAZINE MOTOR CW		

<b>VL37</b>	MAGAZINE MOTOR CCW		
<b>VL38</b>	SPINDE MOTOR STOP		
<b>VL39</b>	SPARE		
<b>VL40</b>	SPARE		
<b>VL41</b>	SPARE		
<b>VL42</b>	SPARE		

#### LIMIT SWITCH( Z )

<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>Z01</b>	X AXIS OVER TRAVEL	10 A 250V ~ IP67	GERMANY Euchner SN02 D12-502 C1688
	X AXIS ZERO POSITION		
<b>Z02</b>	Y AXIS OVER TRAVEL		
	Y AXIS ZERO POSITION		
<b>Z03</b>	Z AXIS OVER TRAVEL		
	Z AXIS ZERO POSITION		
<b>Z05</b>	TOOL UNCLAMP POS.	2A 25V AC	JAPAN Omron SHL-Q2155
<b>Z06</b>	TOOL CLAMP POS.	2A 48V DC	
<b>Z07</b>	MAGAZINE IN LEFT POSITION.	0.5A125VDC EN60947-5-1	JAPAN Omron ZC-Q2255
<b>Z08</b>	MAGAZINE IN RIGHT POSITION.		
<b>Z09</b>	MAGAZION IN ZERO POSITION		
<b>Z11</b>	MAGAZINE IN UP POSITION or MAGAZIN POCKET in HORIZONTAL POSITION	24V DC	TAIWAN CHAN-TO SH22

<b>Z12</b>	MAGAZINE IN DOWN POSITION. or MAGAZIN POCKET In VERTICAL POSITION	24V DC	TAIWAN CHAN-TO SH22
<b>Z14</b>	5th ENP POSITION		
<b>Z30</b>	OPERATION GUARD With LOCK COIL	BIA954020 IEC947-5-1 EN1088	GUCHNER TP3-2131A024PG
<b>Z301</b>	OPERATION GUARD Without LOCK COIL	A300 Q300 4A/400VAC 6A/230VAC	GERMANY Moeller ATO-11-1-2B
<b>Z60</b>	MAGAZINE GUARD With LOCK COIL	BIA954020 IEC947-5-1 EN1088	EUCHNER TP3-2131A024PG
<b>Z601</b>	MAGAZINE GUARD Without LOCK COIL	A300 Q300 4A/400VAC 6A/230VA	GERMANY Moeller ATO-11-1-2B

### PROXIMITY SENSOR(SQ)

<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>SQ01</b>	SPINDLE HIGH GEAR POSITION	24VDC CS-100	TAIWAN CHAN-TO
<b>SQ02</b>	SPINDLE LOW GEAR POSITION	IN-LEE	
<b>SQ03</b>	SPINDLE NEUTRAL GEAR POSITION		
<b>SQ04</b>	TOOL COUNTER	24V DC PNP	GERMANY Schobuch 10CT1214
<b>SQ05</b>	ARM STOP POSITION	24V DC NPN	E2E-CR8C1 OMRON
<b>SQ06</b>	ARM CLAMP POSITION		
<b>SQ07</b>	ARM ZERO POSITION		



<b>SQ08</b>	MAGAZINE ZERO SPARE	24V DC NPN	E2E-CR8C1 OMRON
<b>SQ09</b>	MAGAZINE LOCK PIN FN	24VDC CS-100	TAIWAN CHAN-TO IN-LEE
<b>SQ10</b>	MAGAZINE LOCK PIN OUT		
<b>MAGNETIC VALVE( YV )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>YV01</b>	MAGAZINE FORWARD or MAGAZINE POCKET to VERTICAL	110VAC	GERMANY SHAKO 850404
<b>YV02</b>	MAGAZINE REVERES or MAGAZINE POCKET to HORIZONTAL		
<b>YV03</b>	TOOL UNCLAMP		
<b>YV04</b>	TOOL UNCLAMP & AIR BLOW		
<b>YV06</b>	SPINDLE ROTATE AIR BLOW		
<b>YV07</b>	AIR BLAST		
<b>YV08</b>	SPINDLE GEAR HIGH		
<b>YV09</b>	SPINDLE GEAR LOW		
<b>YV10</b>	SPINDLE GEAR HIGH / NEUTRAL		
<b>YV11</b>	SPINDLE GEAR LOW / NEUTRAL		

<b>OFF DELAY TIMER( D )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>D01</b>	DRIVER	IEC60664-1	JAPAN
<b>D02</b>	OFF DELAY	EN61812-1 24VDC/AC 50/60HZ	OMRON H3CR-H8L
<b>BRIDGE DIODE(VC)</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>VC1</b>	ATC MOTOR BRAKE	INPUT:24VAC OUPUT:24VDC EN60950	TAIWAN MIC MB256
<b>VC2</b>	Z AXIS BRAKE	INPUT:110VAC OUPUT:90VDC	
<b>COIL ( L )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>L01</b>	AUTO POWER OFF	AI-NZM416 A1 AC110V	GERMANY Moeller
<b>SAFETY RELAY ( U )</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>U01</b>	EMERGENCY STOP SAFETY RELAY	24VAC/DC	GERMANY PIIZ PNOZ X3
<b>PRESSURE &amp; FLOAT SWITCH (SL)</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>SL01</b>	AIR LOW PRESSURE	RANGE:0.2~7.5 bar DIFF:0.7~4 bar	POLAND KP35 Danfoss
<b>SL02</b>	LUBRICATION LOW LEVEL	BELONG TO LUBRICATION SYSTEM	TAIWAN Chen-Ying

<b>SL03</b>	LUBRICATION LOW PRESSURE	BELONG TO LUBRICATION SYSTEM	TAIWAN Chen-Ying
<b>EXHAUST FAN (EV)</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>EV1</b>	FAN for CABIN	AC230V 50/60HZ 29W UL.CSA.CE	TAIEAN FULLTECH UF-15PC23BTH
<b>EV2</b>	FAN for AMP.	AC230V 50/60HZ 17W UL.CSA.CE	TAIWAN FULLTECH UF-12A23H
<b>EV3</b>	FAN for SPINDLE MOTOR	Belong TO M101 SPINDLE MOTOR	JAPAN FANUC
<b>EXHAUST FAN (EV)</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>GS1</b>	DC 24V POWER SUPPLY	INPUT:220VAC OUPUT:24V4A	TAIWAN Mean Well
<b>GS2</b>	FANUC POWER SUPPLY MODULE	A06B-6087-H115	JAPAN FANUC
<b>EXHAUST FAN (EV)</b>			
<i>ITEM DESIGNATION</i>	<i>DESCRIPTION AND FUNCTION</i>	<i>TECHNICAL DATA</i>	<i>SUPPLIER Item No</i>
<b>EL01</b>	WORK LAMP	24V 50W EN60598-1	TAIWAN EMINENT MAIN HSN
<b>EL02</b>	INODICATION LAMP	AC110V SCRS-35	TAIWAN SHAN-HO