

Campro Precision Machinery Co., Ltd.

凱柏精密機械股份有限公司



電氣線路手冊

ELECTRICAL MANUAL

立式綜合加工中心機

VERTICAL MACHINING CENTER

HEIDENHAIN CNC

iTNC 530 HSCI Series

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料號 : BK07-530HSCI-EA01A

適用產品 COMPATIBLE PRODUCT :

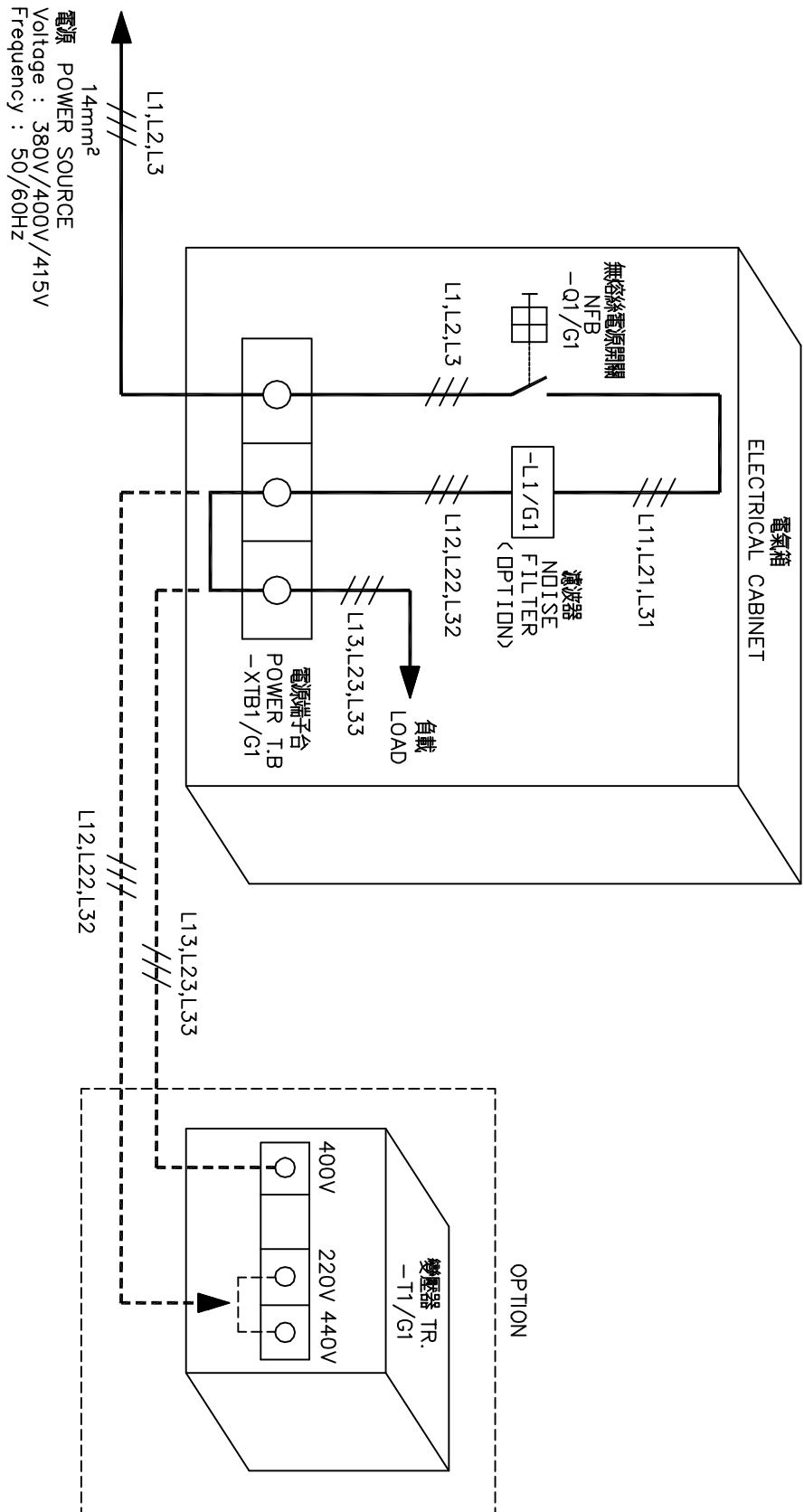
機型 MACHINE MODEL	控制器 CNC CONTROLLER
CPV-550	HEIDENHAIN : iTNC 530 HSCI Series
CPV-750	
CPV-900	
CPV-1100	
CPV-1300	
CPV-850B	
CPV-1100B	
CPV-1200B	
CPV-1400B	
CPV-1600B	
CQV-900	
CQV-1100	
CQV-1300	

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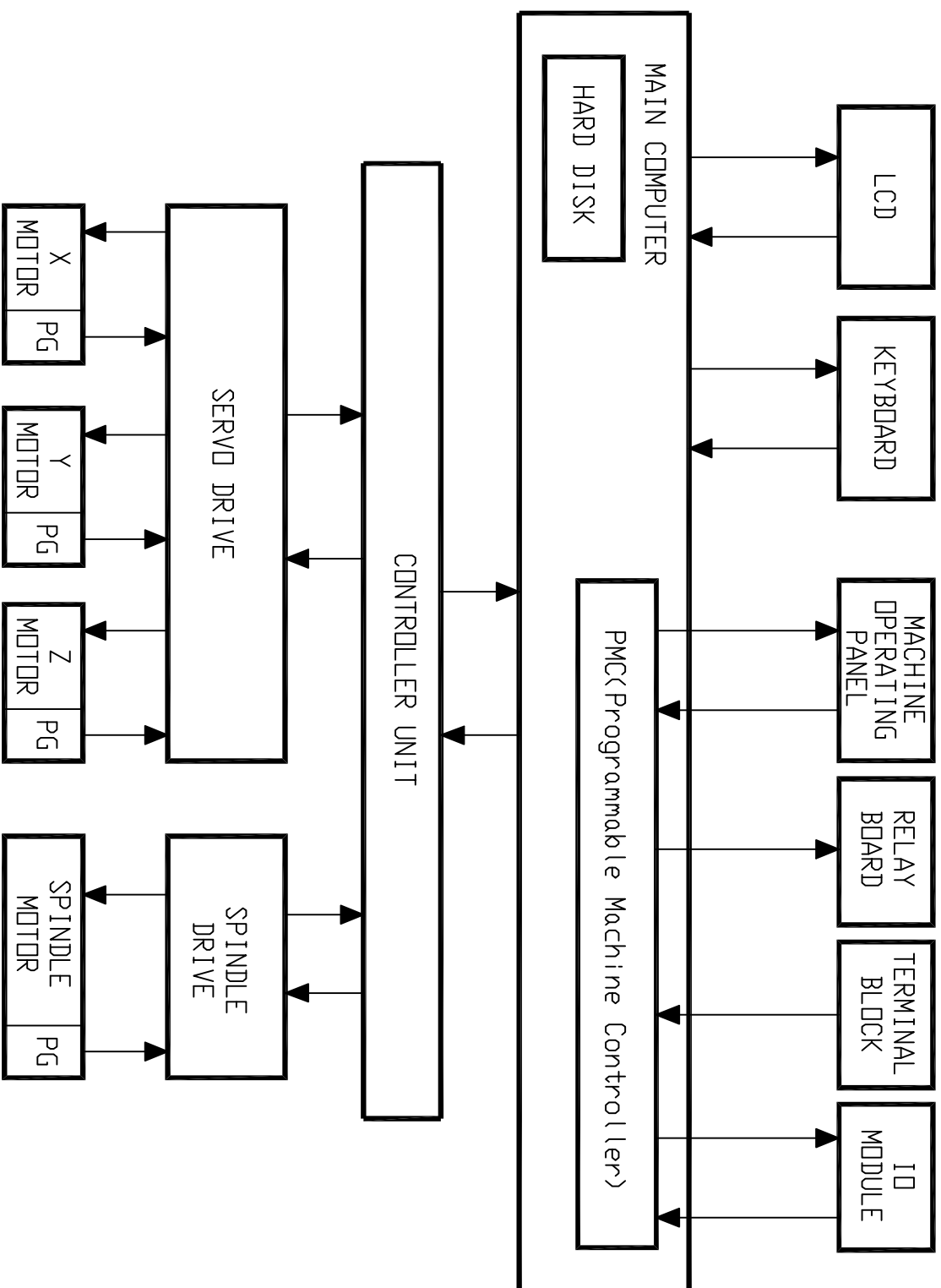
電源入力迴路圖 INCOMING SUPPLY CIRCUIT=



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TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
GENERAL	江健三		111222	H00171A	A1

＝電路系統方塊圖 ELECTRICAL SYSTEM BLOCK DIAGRAM＝



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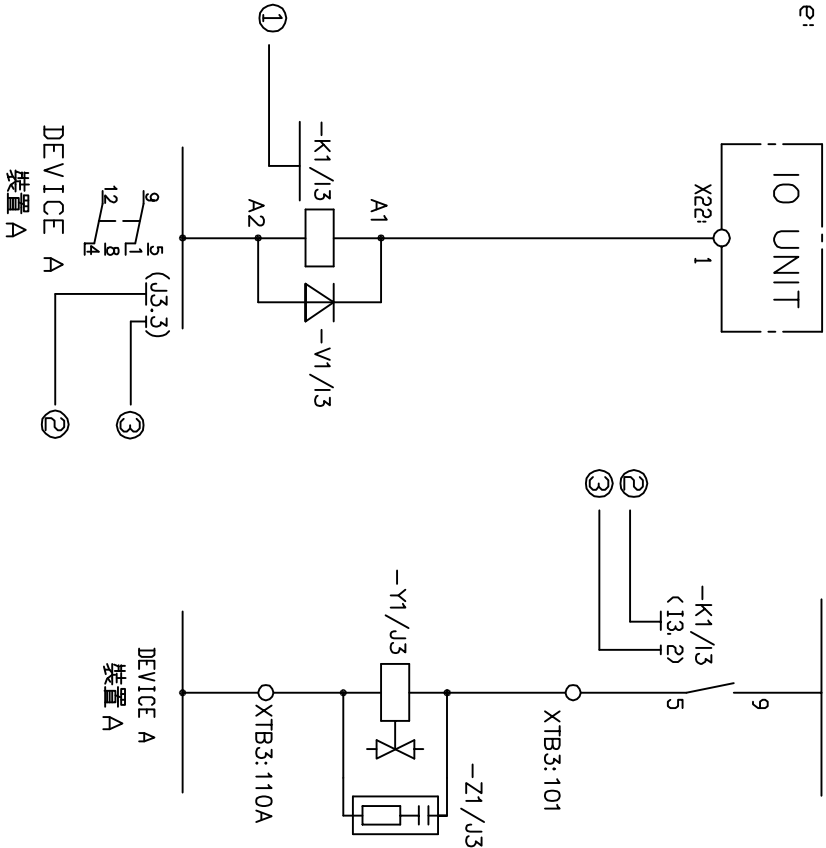
TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
GENERAL		江健三		111222	H00172A	A2

(1) DEVICE SYMBOL EXPLANATION
裝置符號說明

- A : Assemblies 組件
C : Capacitors 電容器
F : Protective devices 保護裝置
H : Signalling equipments 信號裝置
K : Relays, Contactors 繼電器, 接觸器
L : Inductors 感應器
M : Motors 馬達
P : Measuring equipments 量測裝置
Q : Breakers 斷路器
R : Resistors 電阻
S : Switches 開關
T : Transformers 變壓器
V : Semiconductors, Tubes 半導體, 燈管
W : Conductors 導體
X : Terminals, Plugs, Sockets 端子台, 插頭, 插座
Y : Brakes, Solenoids 煞車器, 電磁閥
Z : Spark killers 火花消除器




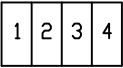




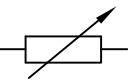





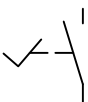
(2) DEVICE LOCATION SEARCH
裝置位置尋找




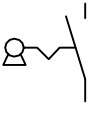
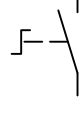

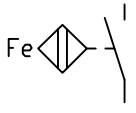
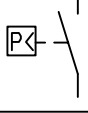
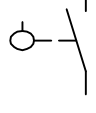
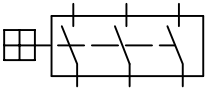
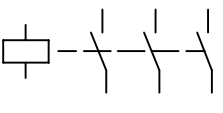
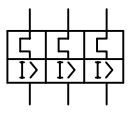
Example:
範例



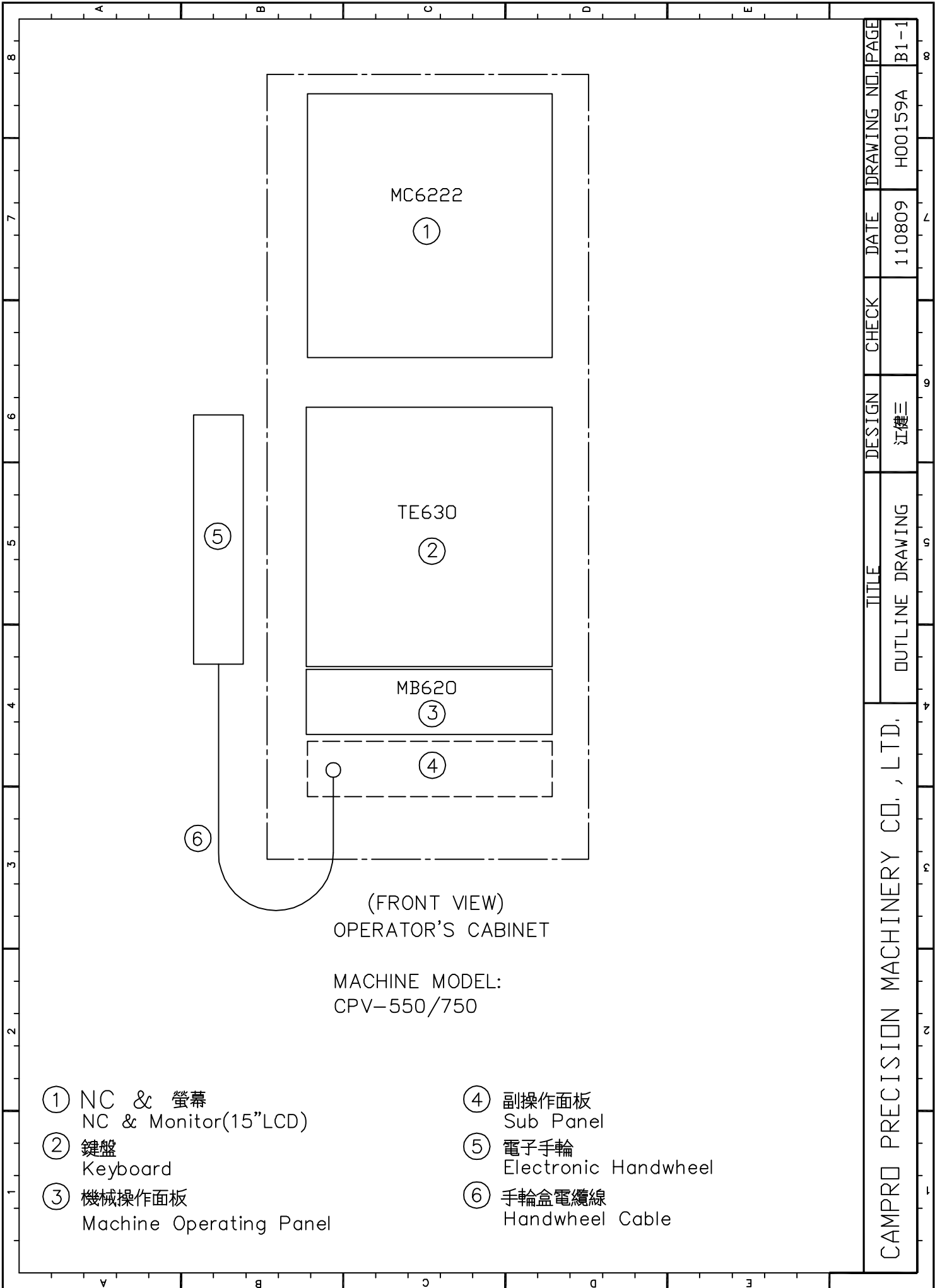
CAMP RD PRECISION MACHINERY CO., LTD.

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
GENERAL	江健三		111222	H00173A	A3-1

電路符號說明 (CIRCUIT SYMBOLS EXPLANATION)					TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
					GENERAL	江健三		111222	F00174A	A3-2
中文 (CHINESE)	英文 (ENGLISH)				符號 (SYMBOL)					
連結器	Connector				 or 					
端子	Terminal									
端子台	Terminal block									
接地	Earth, Ground									
裝置框	Frame for devices									
電阻	Resistor				 or 					
可調電阻	Variable resistor									
電容	Capacitor				 or 					
二極體	Semiconductor diode									
發光二極體	Light emitting diode (LED)									
儀錶	Meter									
腳踏開關	Foot Switch									

電路符號說明 (CIRCUIT SYMBOLS EXPLANATION)			DRAWING NO.	PAGE
中文 (CHINESE)	英文 (ENGLISH)	符號 (SYMBOL)		
按鈕開關	Push-button switch		F00175A	A3-3
二段式按鈕開關	Two-stage push-button switch			
緊急按鈕開關	Emergency push button switch			
鎖型開關	key switch		江健三	GENERAL
旋轉開關	Rotary switch			
極限開關	Limit switch			
近接開關	Proximity switch		CAMPRO PRECISION MACHINERY CO., LTD.	
壓力開關	Pressure switch			
液面開關	Fluid level switch			
三相斷路器	Three-pole breaker			
電磁接觸器	Magnetic contactor			
馬達保護斷路器	Motor-protective circuit-breaker			

電路符號說明 (CIRCUIT SYMBOLS EXPLANATION)			TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
			GENERAL	江健三		111222	F00176A	A3-4
CAMPRO PRECISION MACHINERY CO., LTD.								
中文 (CHINESE)	英文 (ENGLISH)	符號 (SYMBOL)						
線路斷路器	Circuit breaker							
保險絲	Fuse							
變壓器	Transformer							
單相交流馬達	A. C. Single-phase motor							
三相交流馬達	A. C. Three-phase motor							
風扇	Fan							
繼電器	Relay							
計時器	Timer							
電磁閥	Solenoid valve							
蜂鳴器	Buzzer							
燈泡	Lamp							
火花消除器	Spark killer							



(FRONT VIEW)
OPERATOR'S CABINET

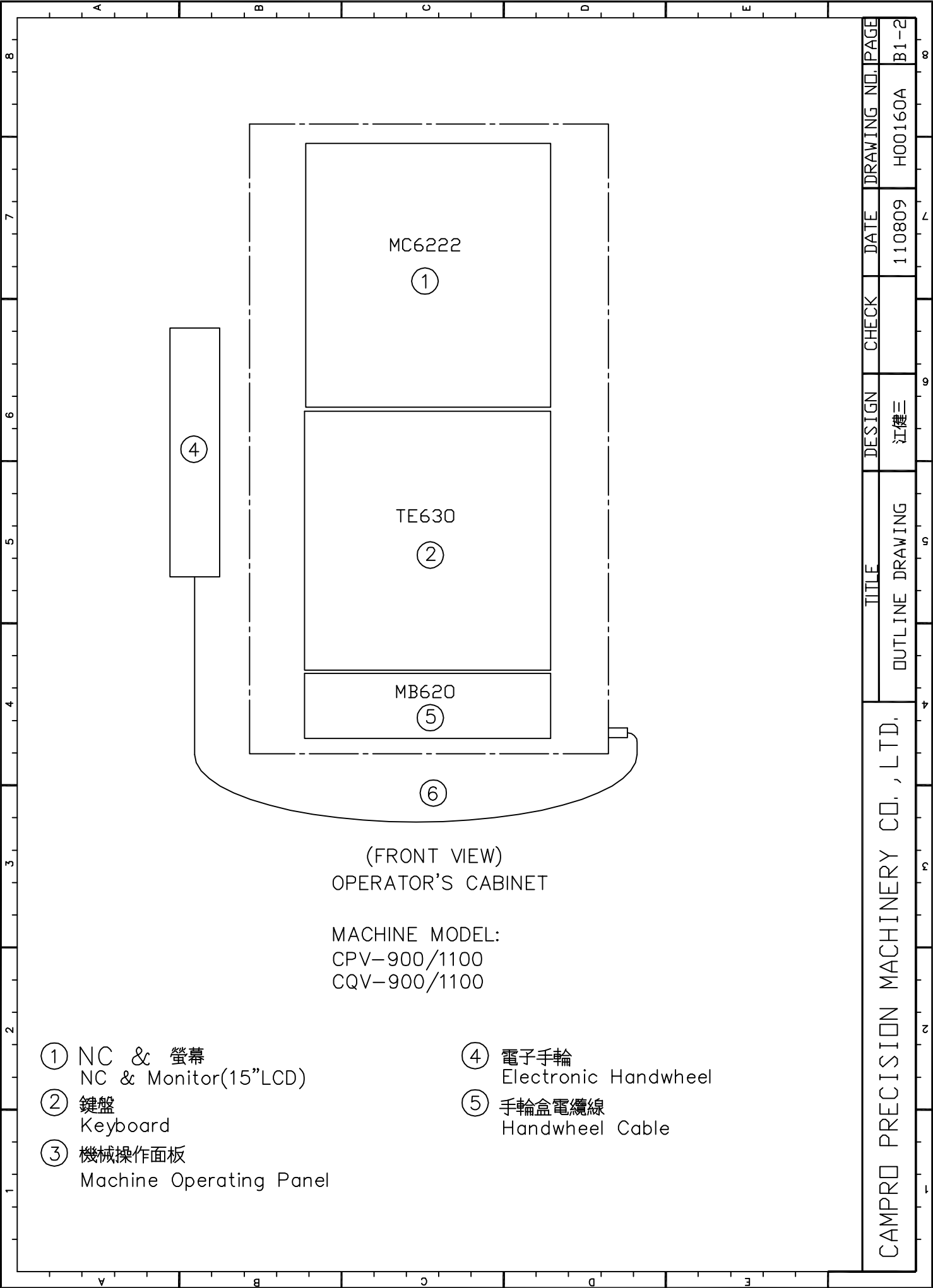
MACHINE MODEL:
CPV-550/750

- ① NC & 螢幕
NC & Monitor(15"LCD)
- ② 鍵盤
Keyboard
- ③ 機械操作面板
Machine Operating Panel

- ④ 副操作面板
Sub Panel
- ⑤ 電子手輪
Electronic Handwheel
- ⑥ 手輪盒電纜線
Handwheel Cable

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING	江健三		110809	H00159A	B1-1

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(FRONT VIEW)
OPERATOR'S CABINET

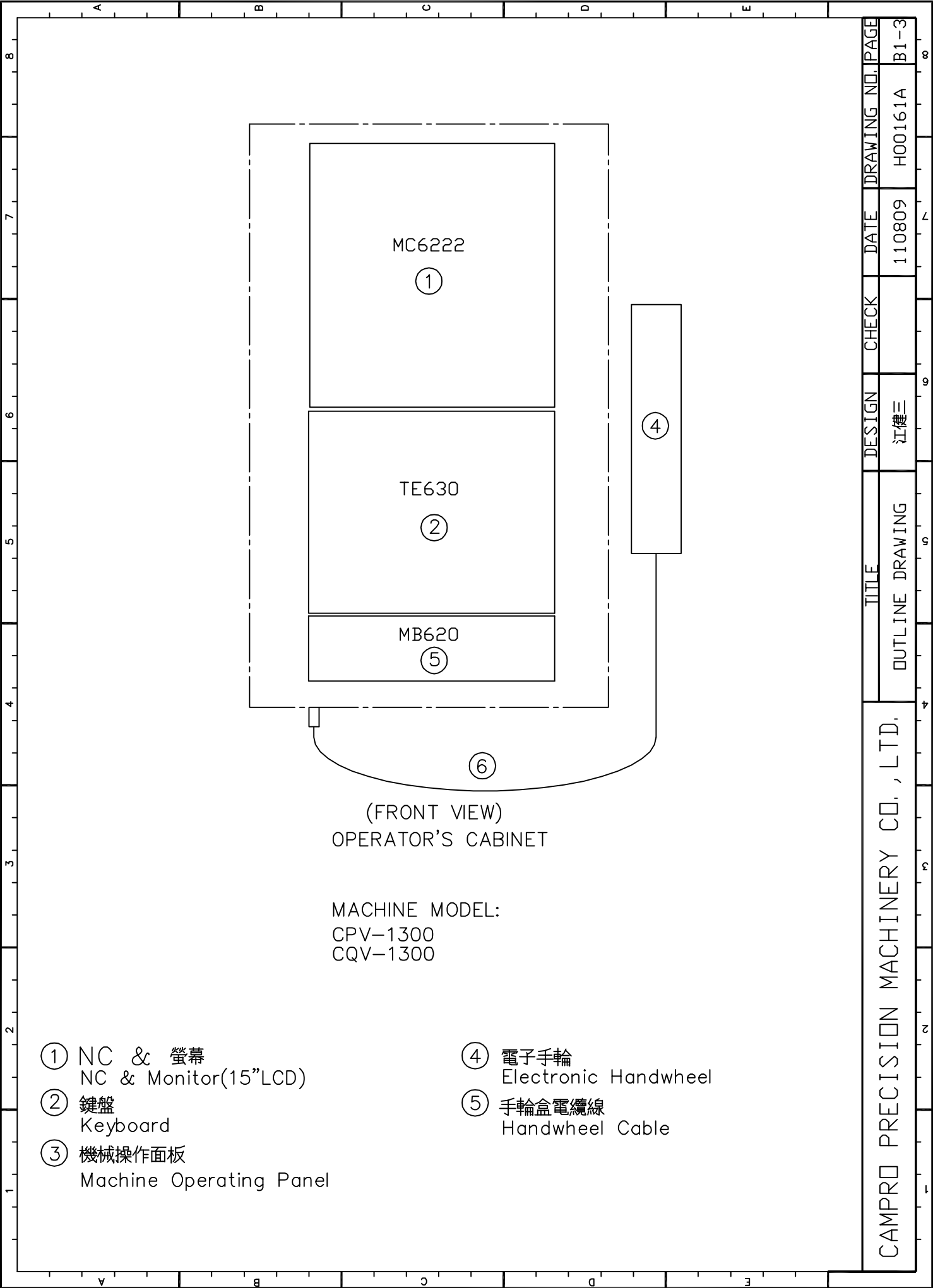
MACHINE MODEL:
CPV-900/1100
CQV-900/1100

- ① NC & 螢幕
NC & Monitor(15"LCD)
- ② 鍵盤
Keyboard
- ③ 機械操作面板
Machine Operating Panel

- ④ 電子手輪
Electronic Handwheel
- ⑤ 手輪盒電纜線
Handwheel Cable

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING		江健三		110809	H00160A	B1-2

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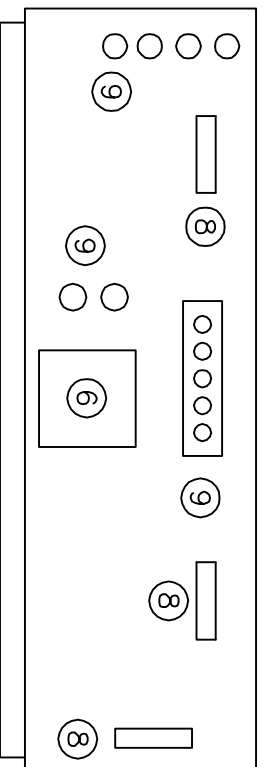
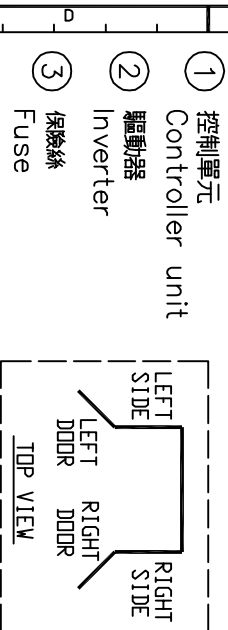
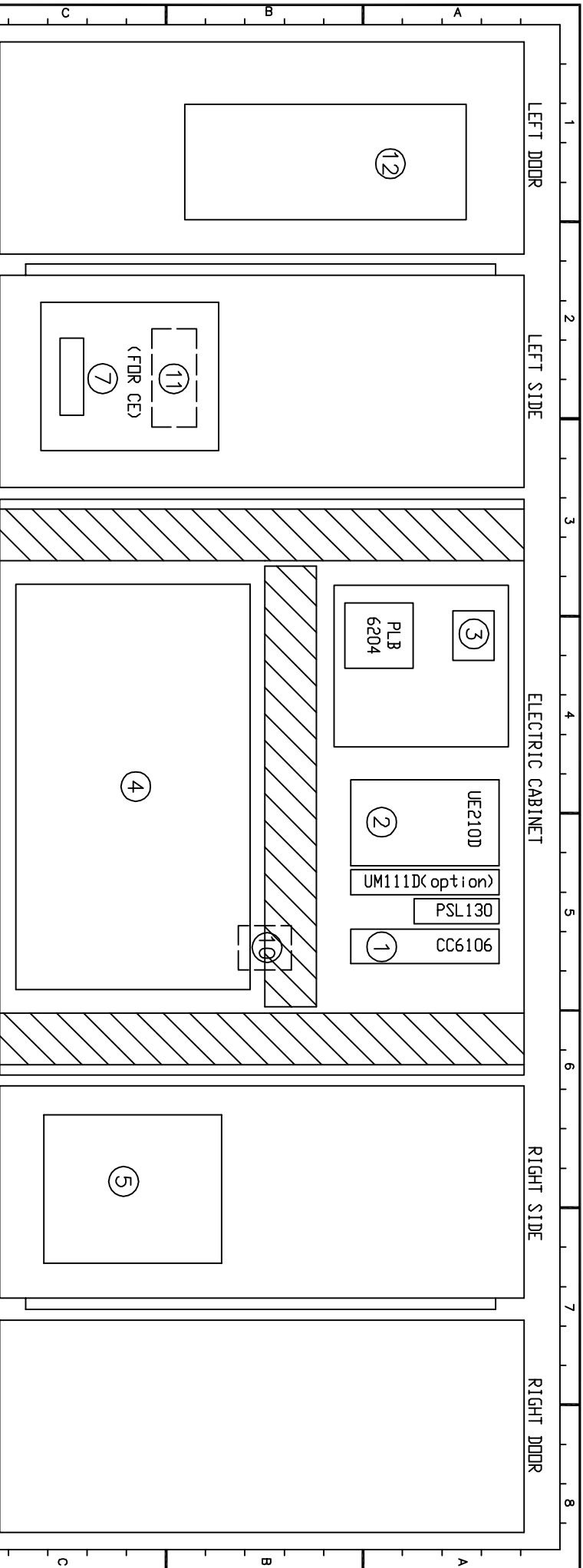
(FRONT VIEW)
OPERATOR'S CABINET

MACHINE MODEL:
CPV-1300
CQV-1300

- ① NC & 螢幕
NC & Monitor(15"LCD)
- ② 鍵盤
Keyboard
- ③ 機械操作面板
Machine Operating Panel

- ④ 電子手輪
Electronic Handwheel
- ⑤ 手輪盒電纜線
Handwheel Cable

CAMPRO PRECISION MACHINERY CO., LTD.	TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
	OUTLINE DRAWING	江健三		110809	H00161A	B1-3



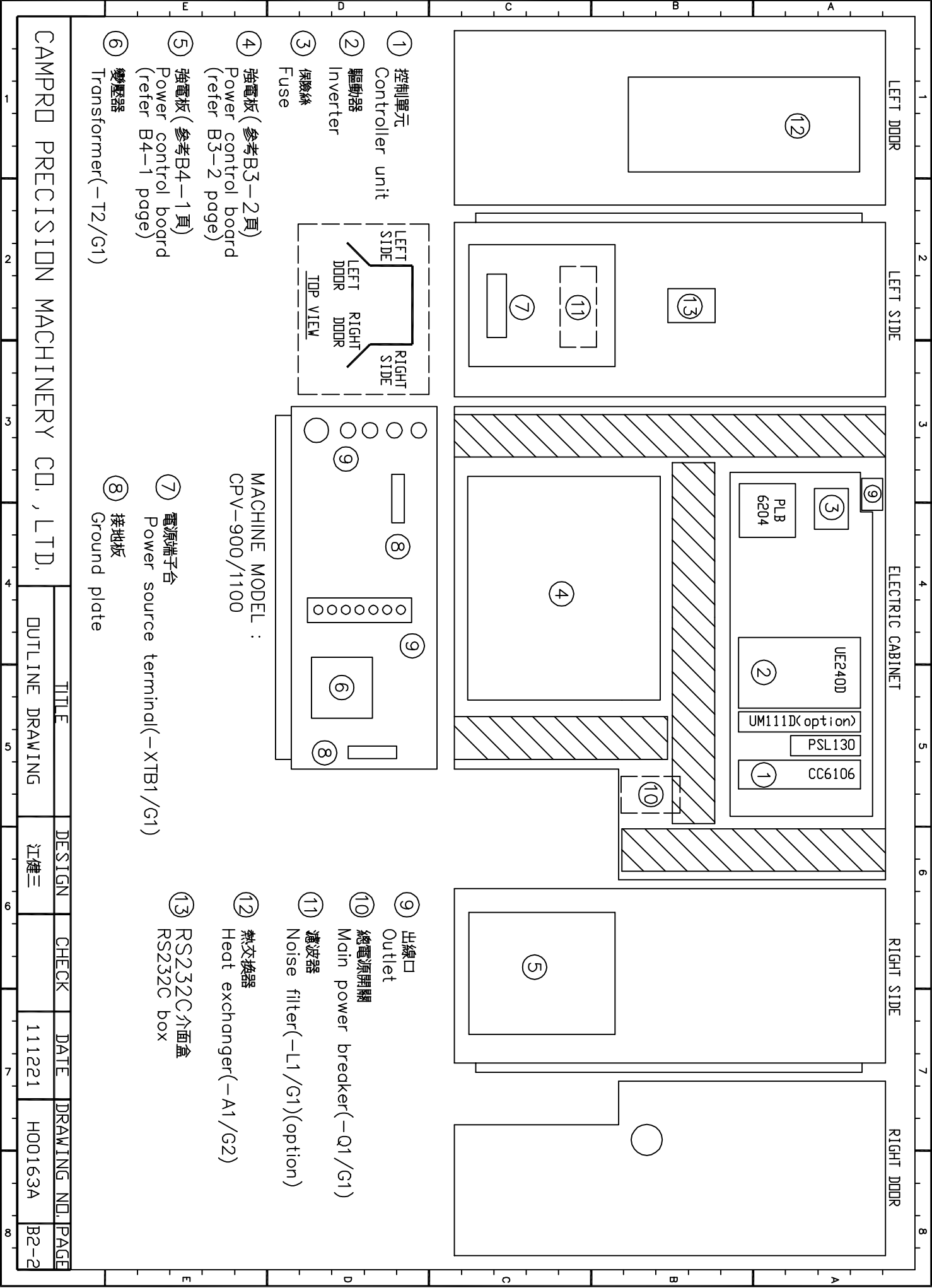
- 1 控制單元
Controller unit
- 2 驅動器
Inverter
- 3 保險絲
Fuse
- 4 強電板 (參考B3-1頁)
Power control board
(refer B3-1 page)
- 5 強電板 (參考B4-1頁)
Power control board
(refer B4-1 page)
- 6 變壓器
Transformer(-T2/G1)

- 7 電源端子台
Power source terminal(-XTB1/G1)
- 8 接地板
Ground plate

- 9 出線口
Outlet
- 10 總電源開關
Main power breaker(-Q1/G1)
- 11 濾波器
Noise filter(-L1/G1)(option)
- 12 熱交換器
Heat exchanger(-A1/G2)

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TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING	江健三		111221	H00162A	B2-1



LEFT DOOR

LEFT SIDE

ELECTRIC CABINET

RIGHT SIDE

RIGHT DOOR

12

13

4

5

1 控制單元
Controller unit

2 驅動器
Inverter

3 保險絲
Fuse

4 強電板 (參考B3-2頁)
Power control board
(refer B3-2 page)

5 強電板 (參考B4-1頁)
Power control board
(refer B4-1 page)

6 變壓器
Transformer(-T2/G1)

7 電源端子台
Power source terminal(-XTB1/G1)

8 接地板
Ground plate

LEFT SIDE
RIGHT SIDE
LEFT DOOR
RIGHT DOOR
TOP VIEW

MACHINE MODEL :
CPV-900/1100

9 出線口
Outlet

10 總電源開關
Main power breaker(-Q1/G1)

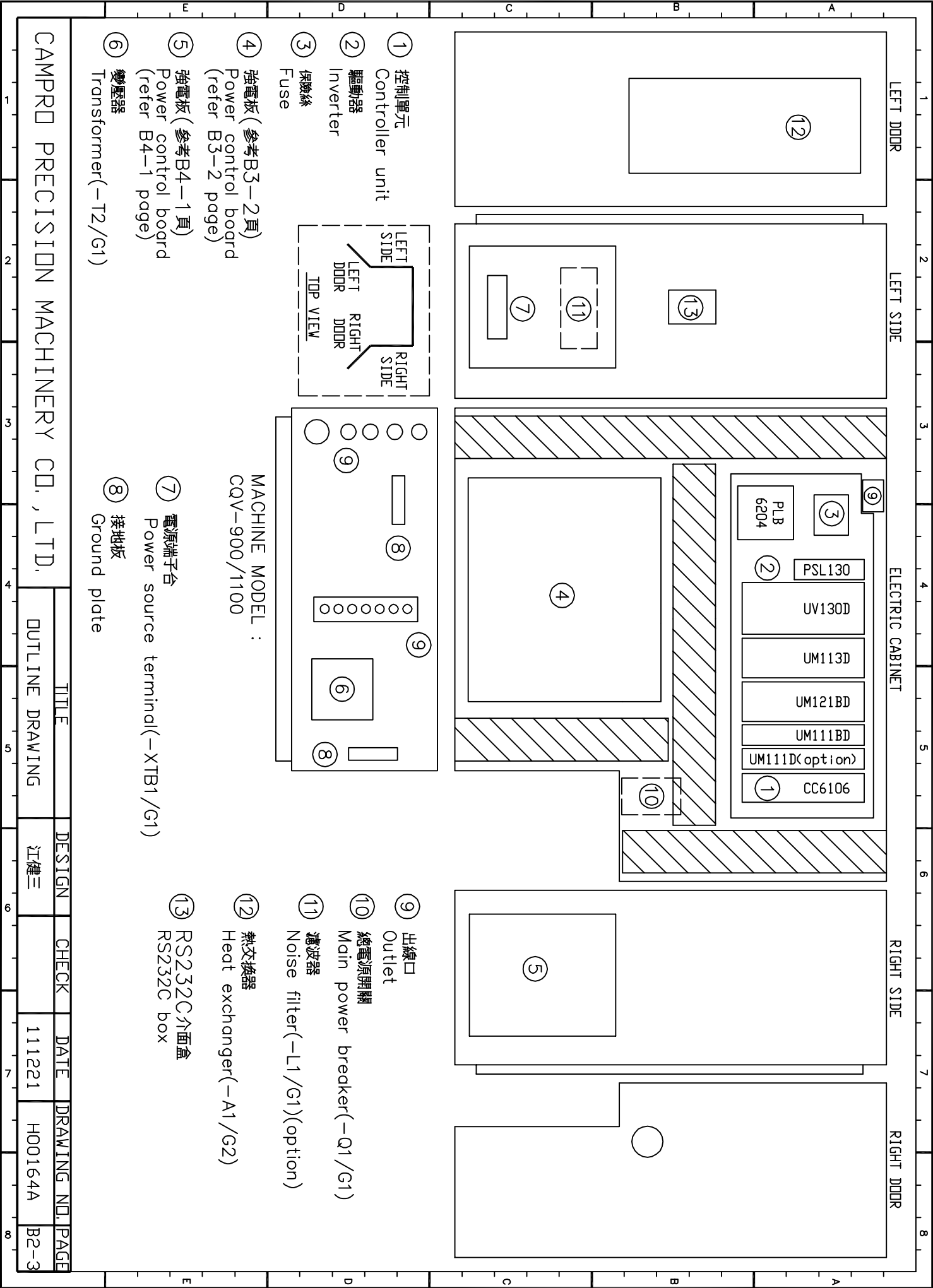
11 濾波器
Noise filter(-L1/G1)(option)

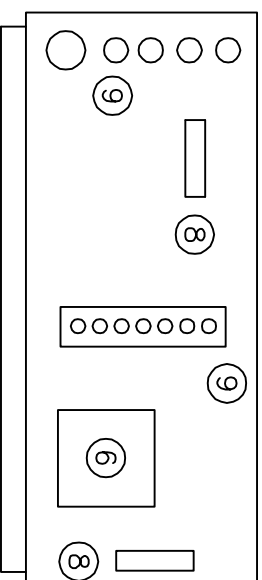
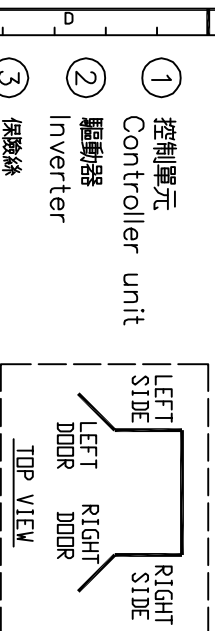
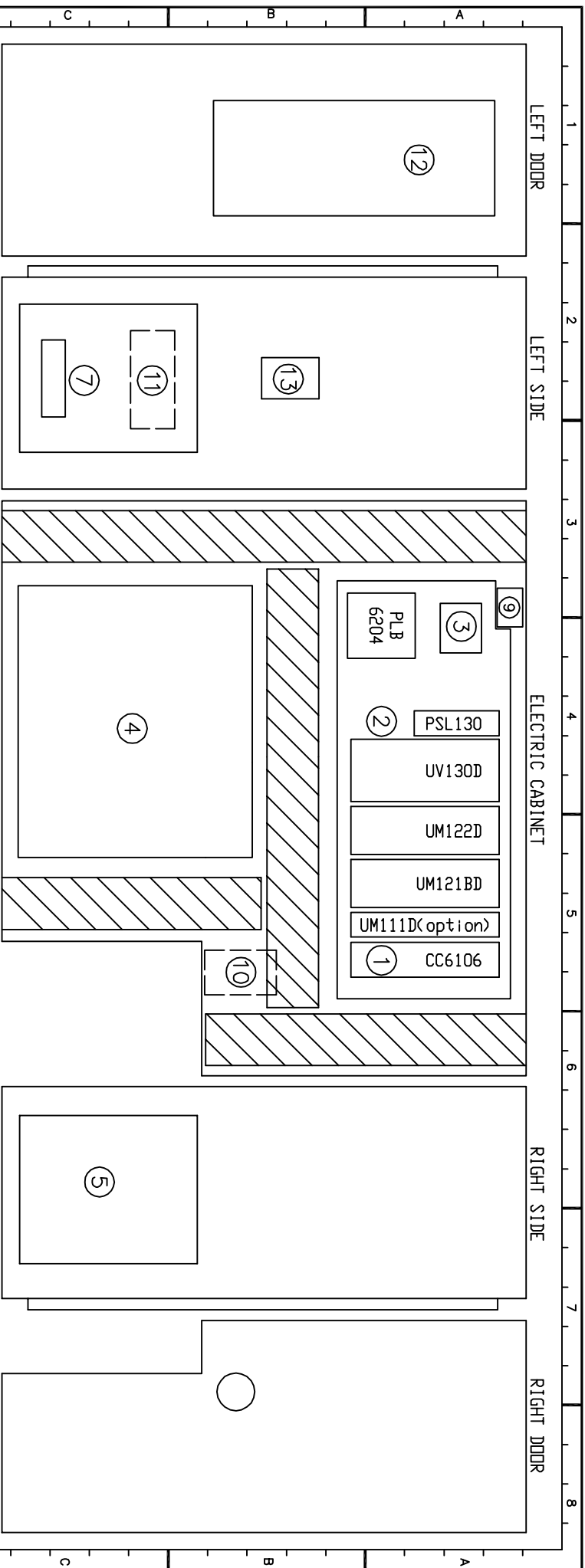
12 熱交換器
Heat exchanger(-A1/G2)

13 RS232C介面盒
RS232C box

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TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING		江健三		111221	H00163A	B2-2





- ① 控制單元
Controller unit
- ② 驅動器
Inverter
- ③ 保險絲
Fuse
- ④ 強電板 (參考B3-2頁)
Power control board
(refer B3-2 page)
- ⑤ 強電板 (參考B4-1頁)
Power control board
(refer B4-1 page)
- ⑥ 變壓器
Transformer(-T2/G1)
- ⑦ 電源端子台
Power source terminal(-XTB1/G1)
- ⑧ 接地板
Ground plate
- ⑨ 出線口
Outlet
- ⑩ 總電源開關
Main power breaker(-Q1/G1)
- ⑪ 濾波器
Noise filter(-L1/G1)(option)
- ⑫ 熱交換器
Heat exchanger(-A1/G2)
- ⑬ RS232C介面盒
RS232C box

CAMPRD PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING		江健三		111221	H00165A	B2-4

MACHINE MODEL:
CPV-550/750

RELAY BOARD
(-A1/B3)

-Q1/C2

-Q2/G1(2P)

-Q3/G1(2P)

-Q4/G1(1P)

-Q5/G1(1P)

-Q1/G4(1P)

-SSK1/F1

-SSK1/F2

-K1/F2

TIMER

-K1/F1(4P)

-K2/F1(4P)

-K3/F1(4P)

-K4/F1(2P)

-K5/F1(2P)

-K2/F2(4P)

-K3/F2(4P)

-K4/F2(2P)

-K5/F2(2P)

-K1/I4(4P)

-K2/I4(2P)

-Q1/G5

ARM

AUX CNT.

MAG

-Q2/G5

AUX CNT.

COOLANT

-Q3/G5

AUX CNT.

-Q4/G5

DIL COOLER

AUX CNT.

SP MDT FAN

-Q2/G1(2P)

-Q3/G1(2P)

-Q4/G1(1P)

-Q5/G1(1P)

-Q1/G4(1P)

-SSK1/F1

-SSK1/F2

-K1/F2

TIMER

-K1/F1(4P)

-K2/F1(4P)

-K3/F1(4P)

-K4/F1(2P)

-K5/F1(2P)

-K2/F2(4P)

-K3/F2(4P)

-K4/F2(2P)

-K5/F2(2P)

-K1/I4(4P)

-K2/I4(2P)

-Q1/G5

ARM

AUX CNT.

MAG

-Q2/G5

AUX CNT.

COOLANT

-Q3/G5

AUX CNT.

-Q4/G5

DIL COOLER

AUX CNT.

ARM

-K1/K1

MAG CW

-K2/K1

INTERLOCK

MAG CCW

-K3/K1

COOLANT

-K4/K1

DIL COOLER

-K5/K1

-Z1/G5

-Z2/G5

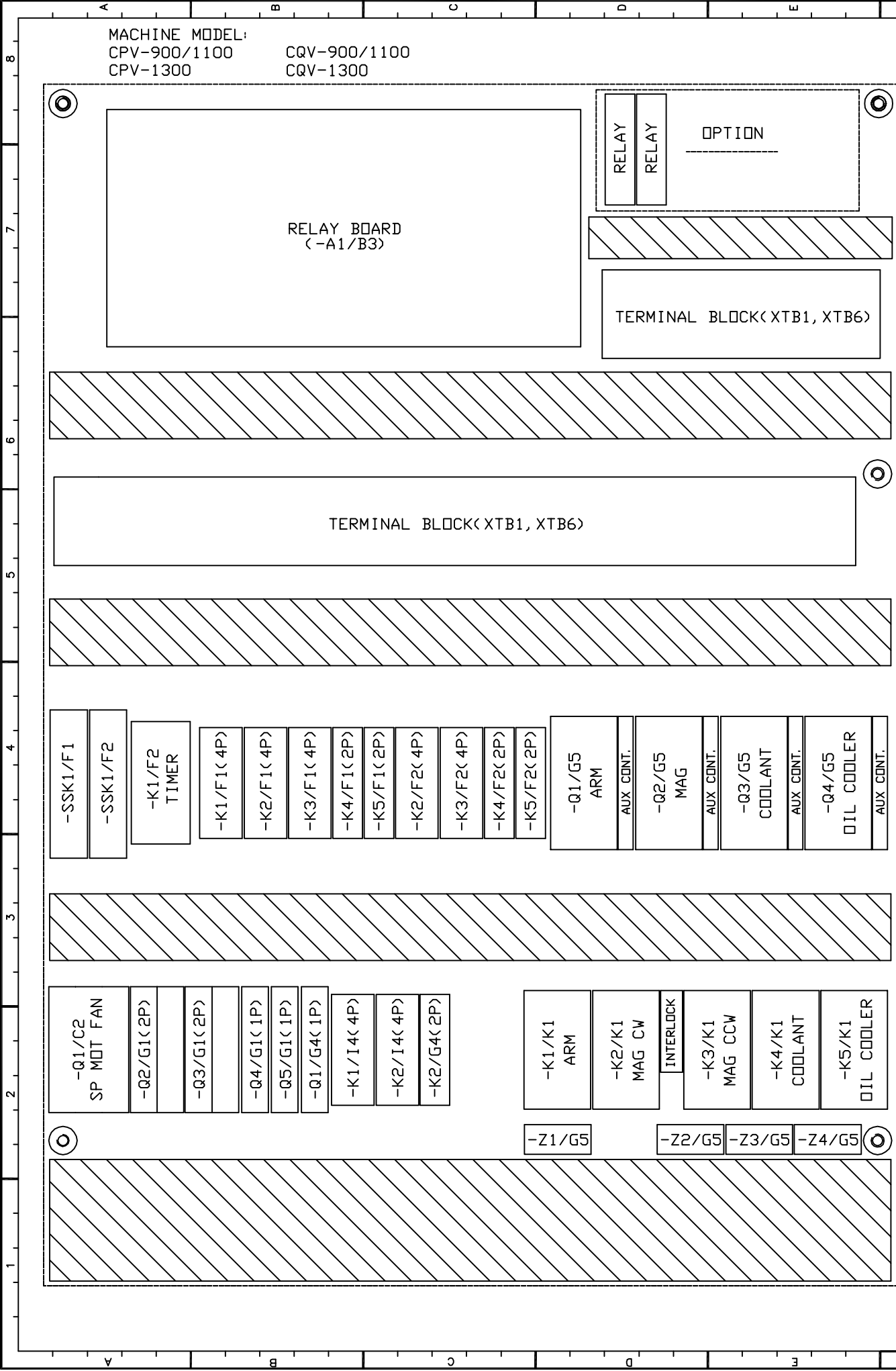
-Z3/G5

-Z4/G5

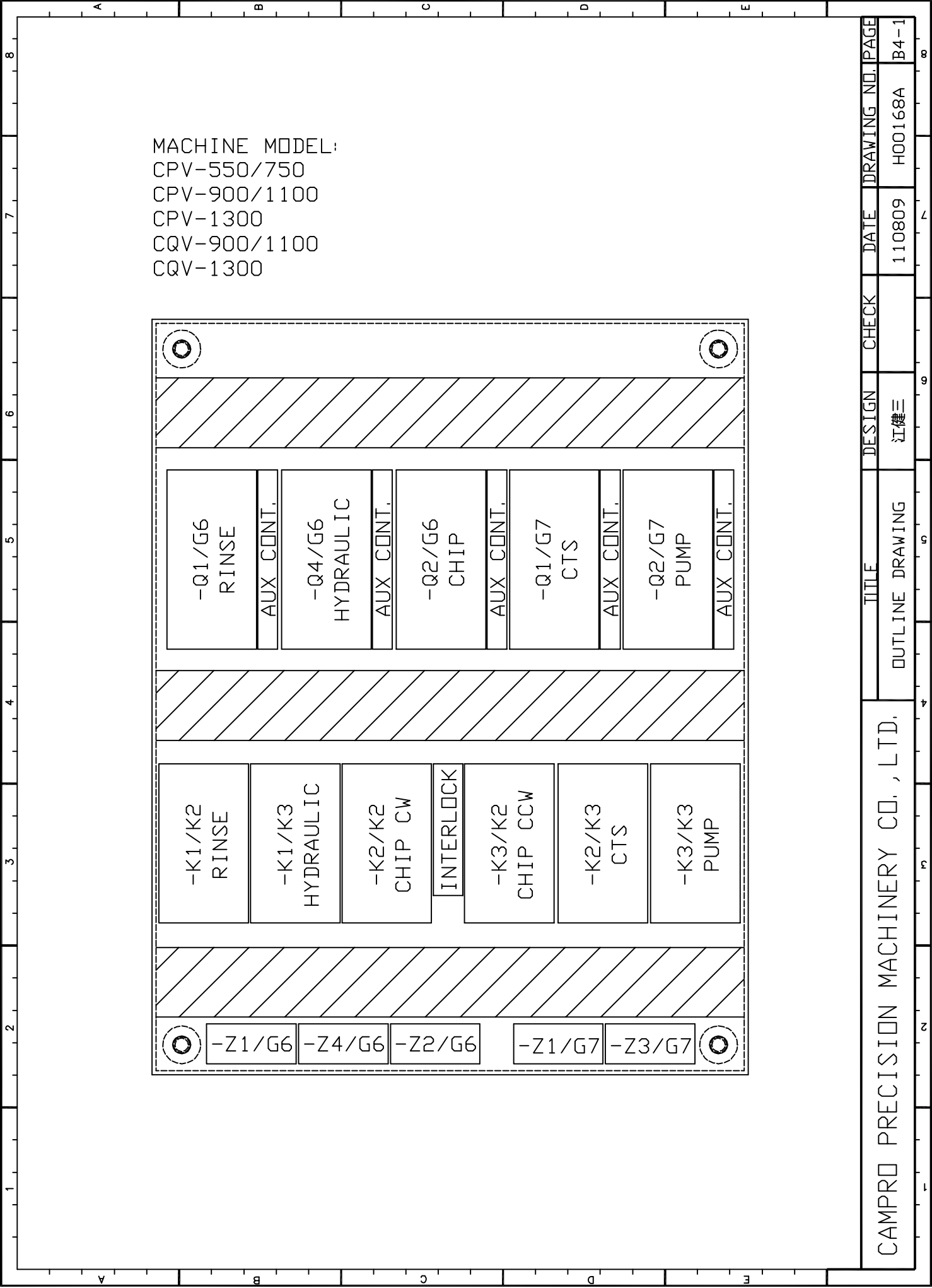
TERMINAL BLOCK(XTB1, XTB6)

CAMPRO PRECISION MACHINERY CO., LTD.

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING	江健三		110812	H00166A	B3-1



CAMPRO PRECISION MACHINERY CO., LTD.				TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
				OUTLINE DRAWING	江健三		111221	H00167A	B3-2

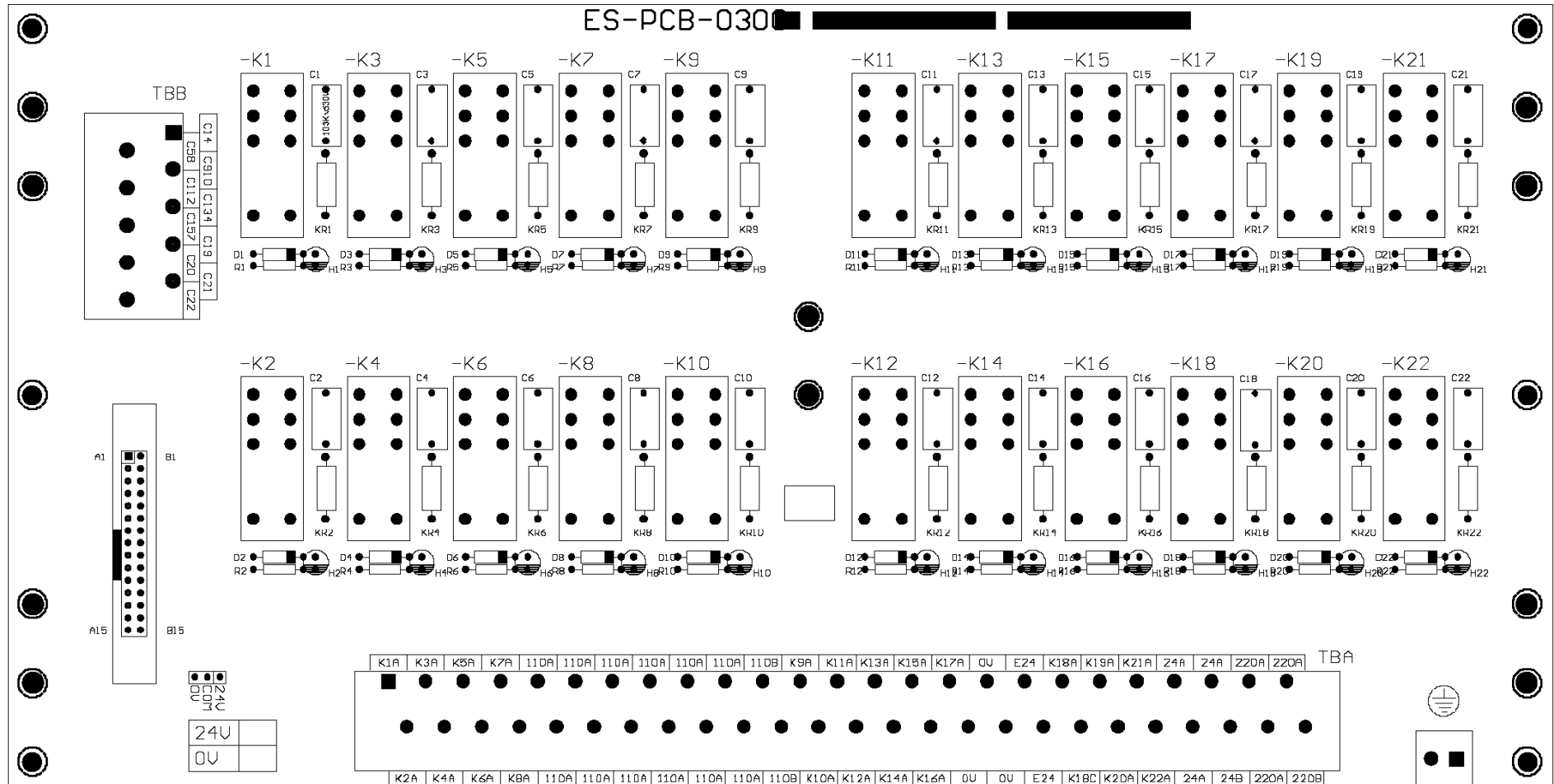


CAMPRO PRECISION MACHINERY CO., LTD.

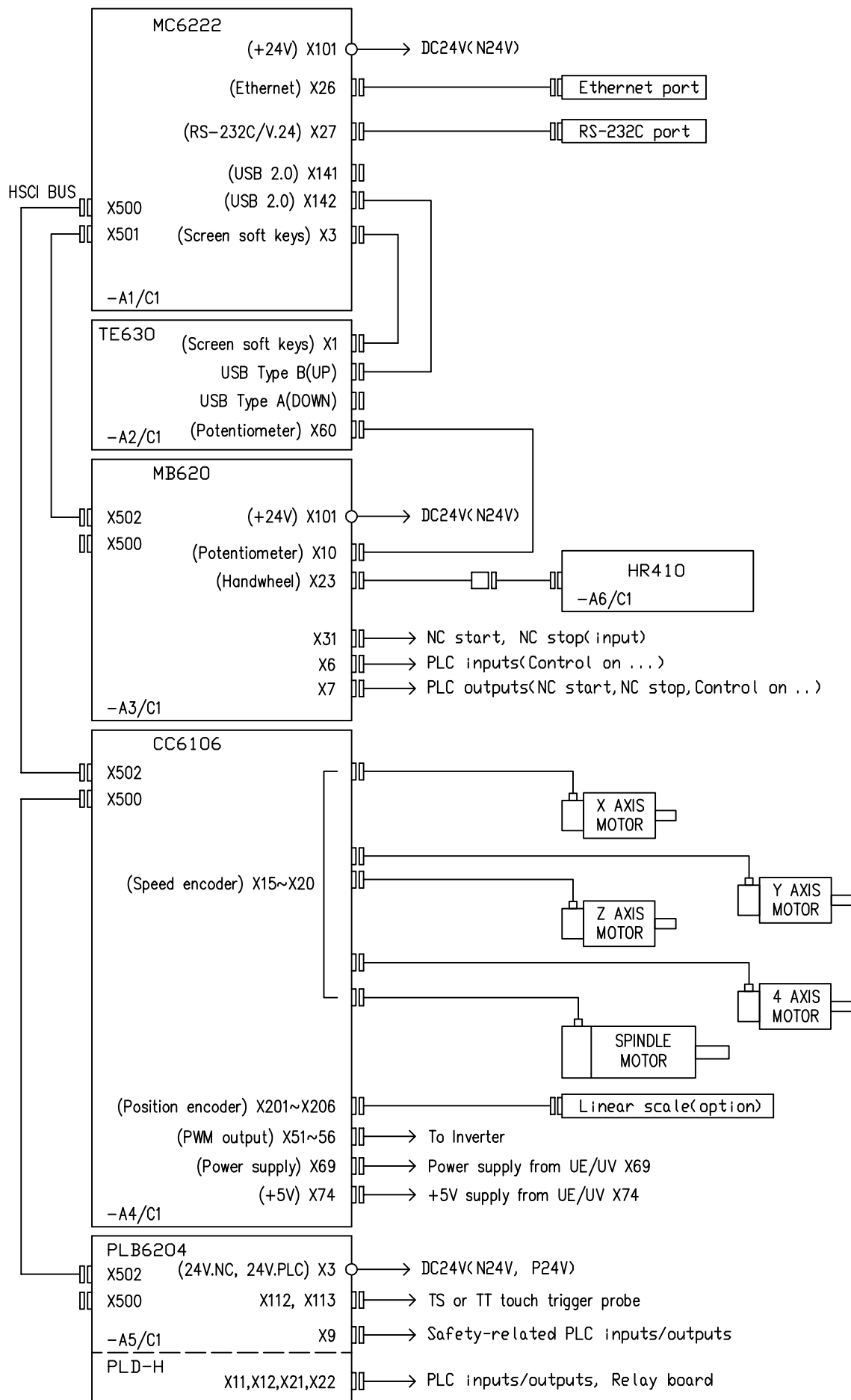
TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
OUTLINE DRAWING		江健三		110809	H00168A	B4-1

繼電器板

RELAY BOARD



= iTNC530HSCI SYSTEM CONNECTION =



TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
SYSTEM CIRCUIT	江健三		111221	H00112A	C1-1

CAMPRO PRECISION MACHINERY CO., LTD.

3Ø AC380V/400V/415V

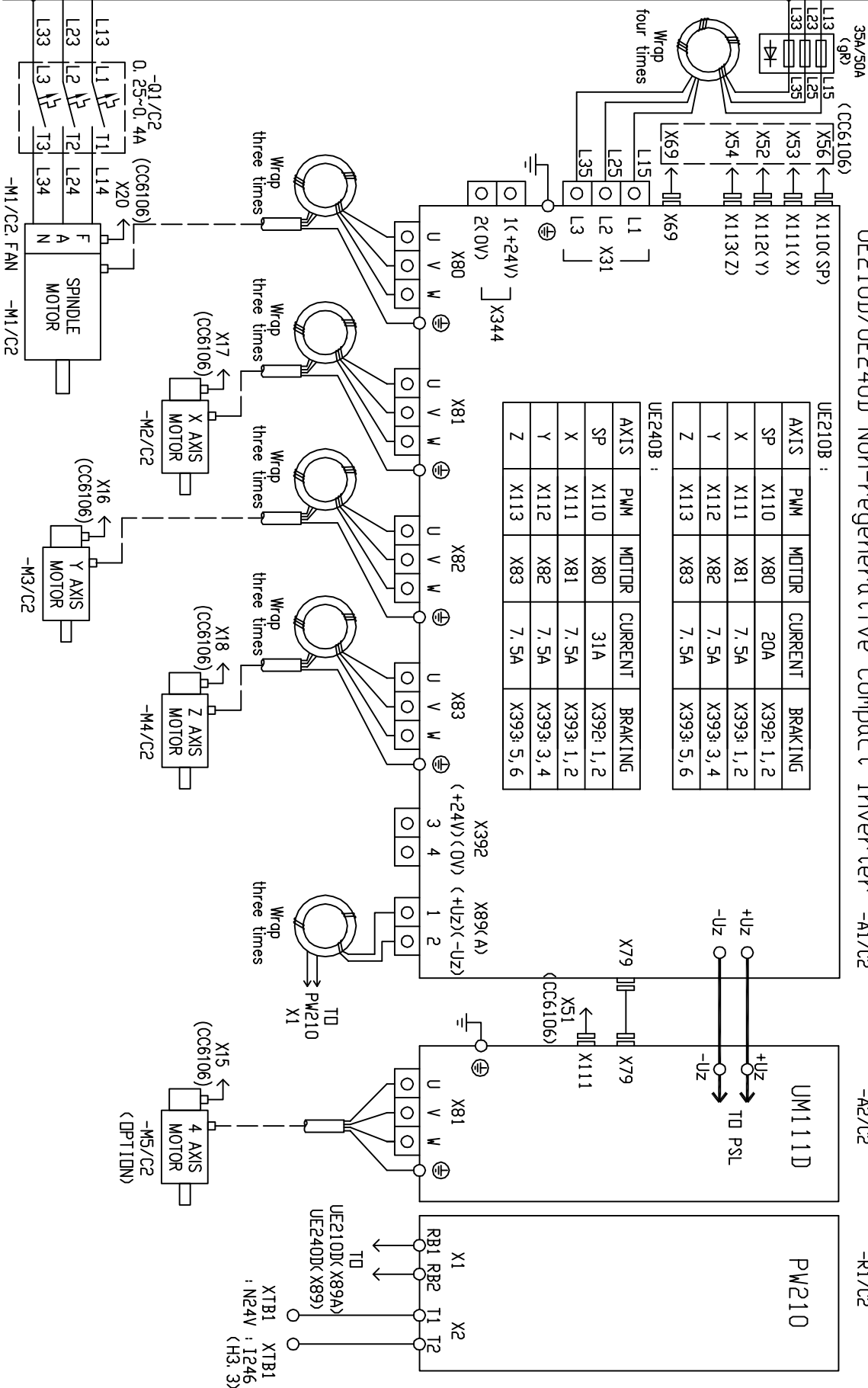
= CPV-550/750, 900/1100 : SPINDLE/AXES DRIVE FOR UE SERIES + UM111 =

PE L13 L23 L33

UE210D/UE240D Non-regenerative Compact Inverter-A1/c2

-A2/C2

-R1/C2



CAMPRD PRECISION MACHINERY CO., LTD.

TITLE	SYSTEM CIRCUIT

DESIGN
江健三

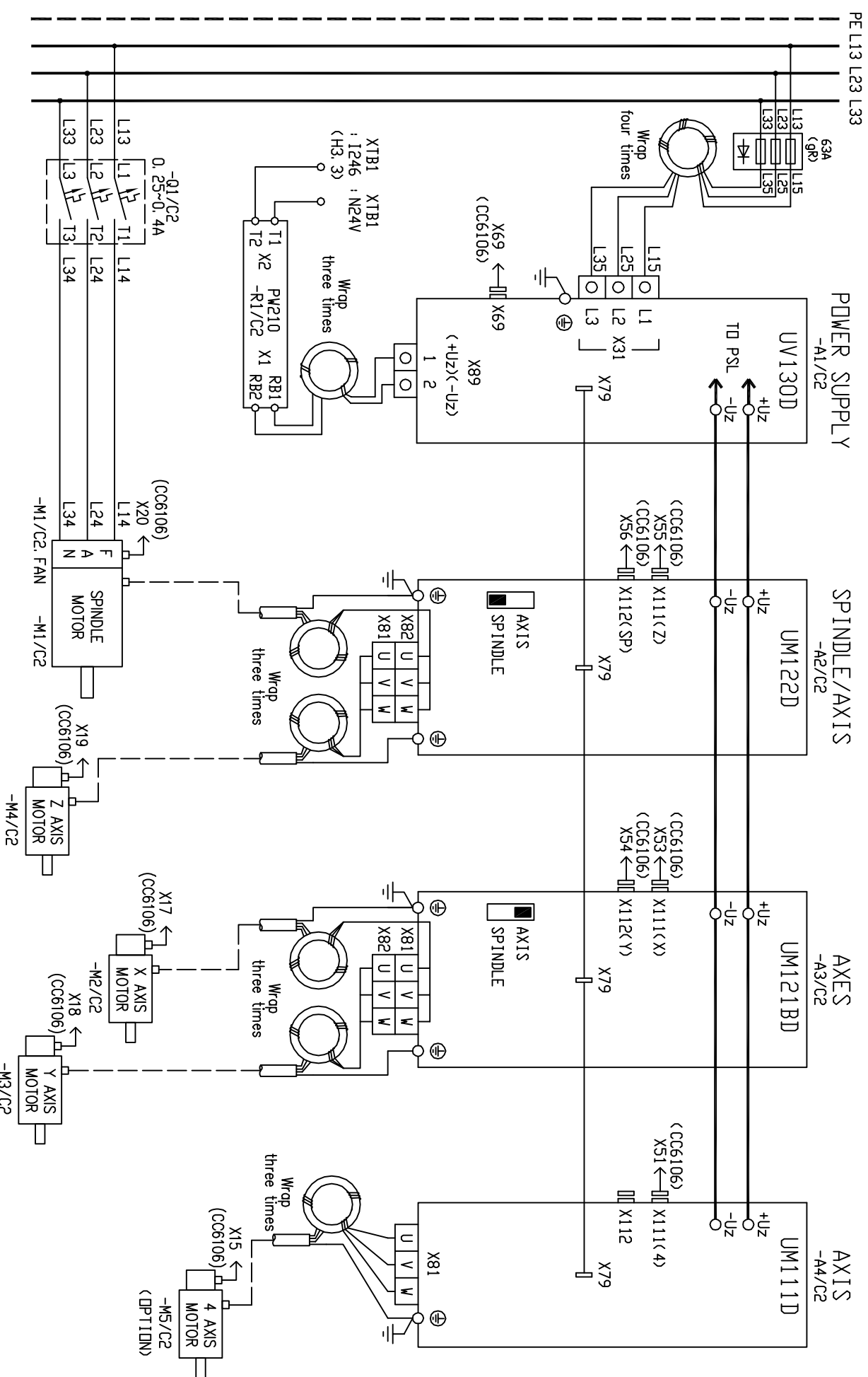
CHECK

DATE
111107

DRAWING NO.	PAGE
H00113A	C2-1

3Ø AC380V/400V/415V

= CPV-1300 : POWER SUPPLY FOR UV130 & SPINDLE/AXES DRIVE FOR UM SERIES =



CAMPRO PRECISION MACHINERY CO., LTD.

SYSTEM CIRCUIT

DESIGN 江健三

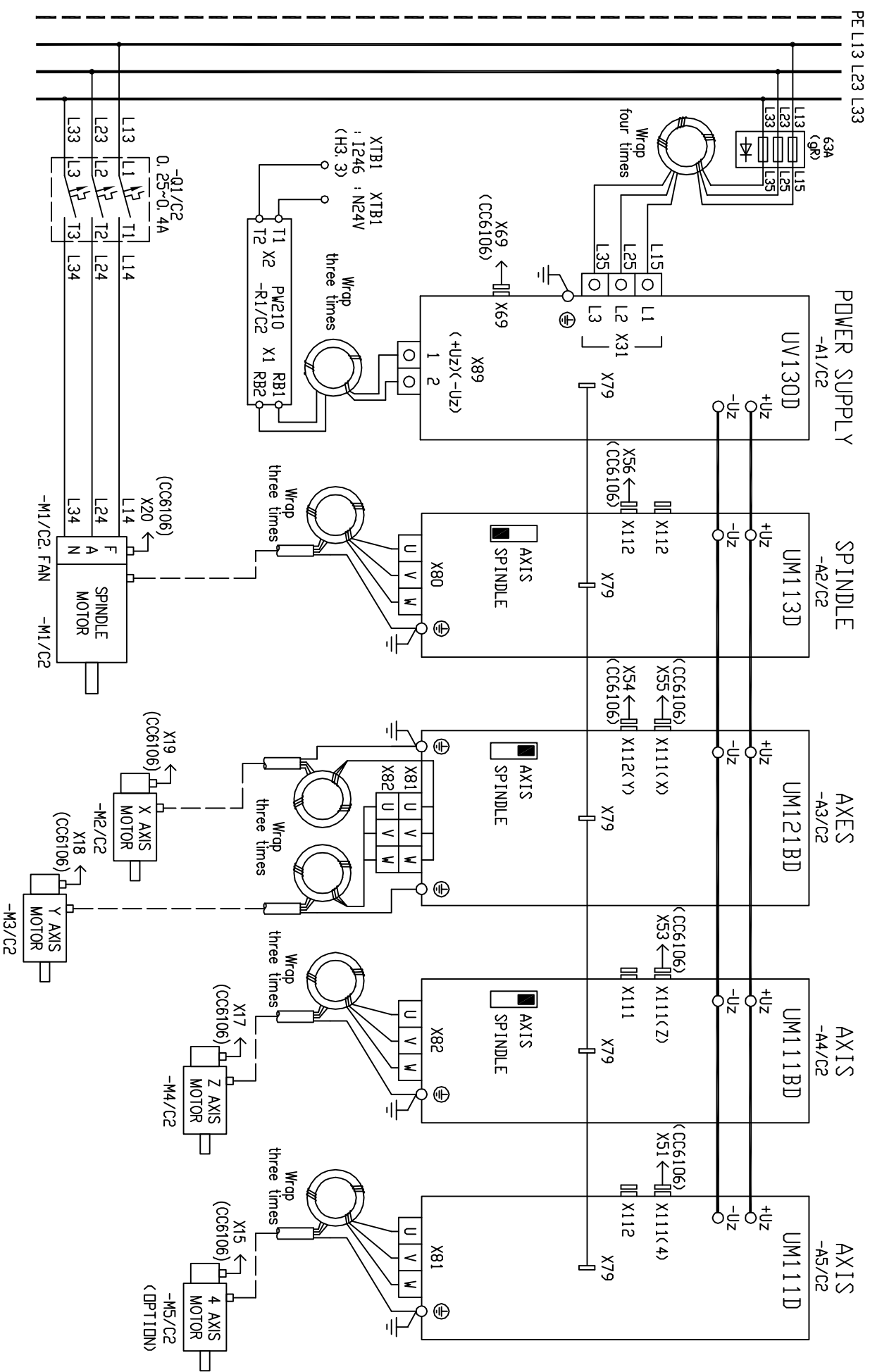
CHECK

DATE 111107

DRAWING NO. H00114A

PAGE C2-2

= CQV-900/1100 : POWER SUPPLY FOR UV130 & SPINDLE/AXES DRIVE FOR UM SERIES =



SYSTEM CIRCUIT

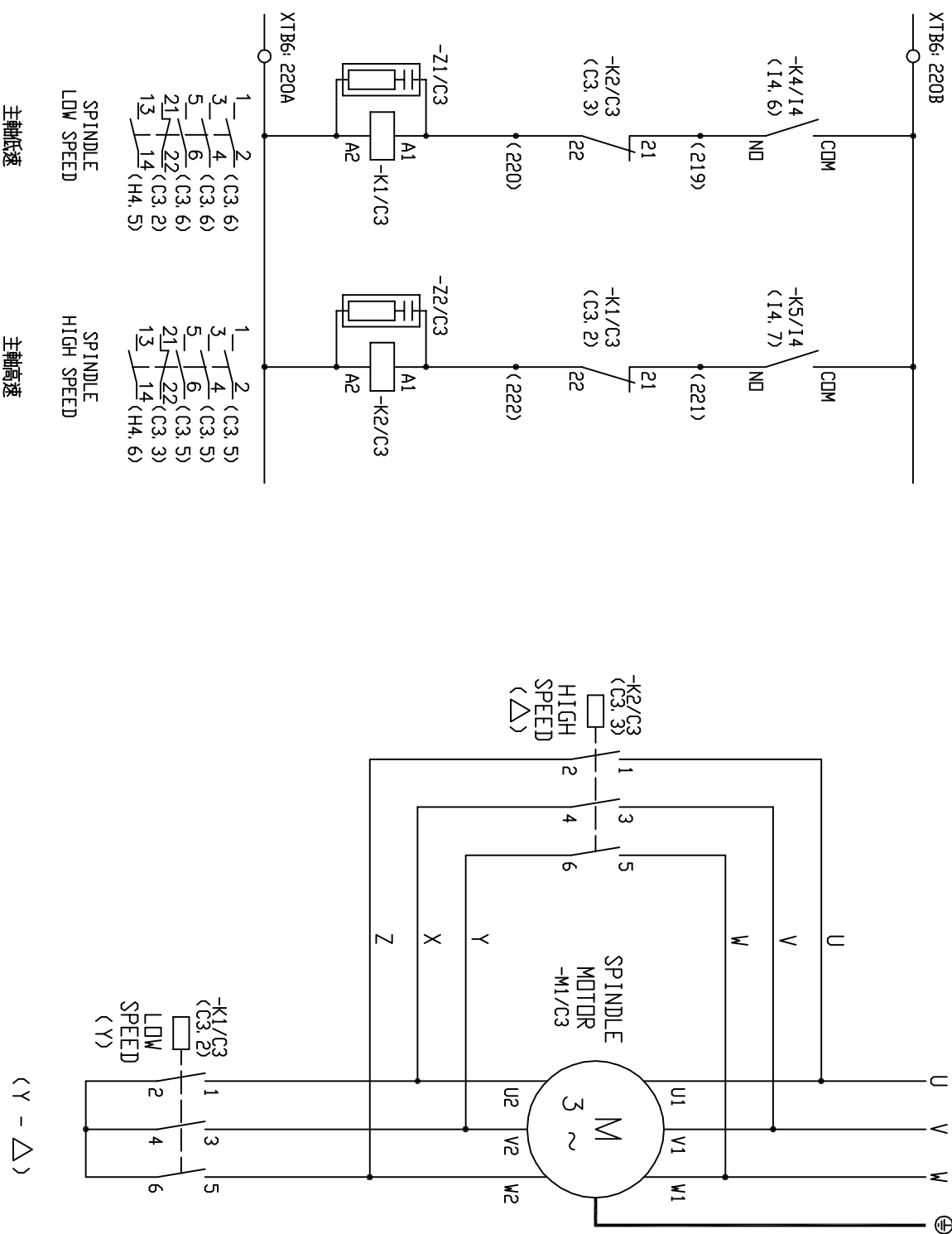
CHECK

DRAWING N	
H00115A	

PAGE	1
C2-3	

= SPINDLE MOTOR HIGH/LOW SPEED CONTROL =

主軸馬達高/低速控制



CAMPRO PRECISION MACHINERY CO., LTD.

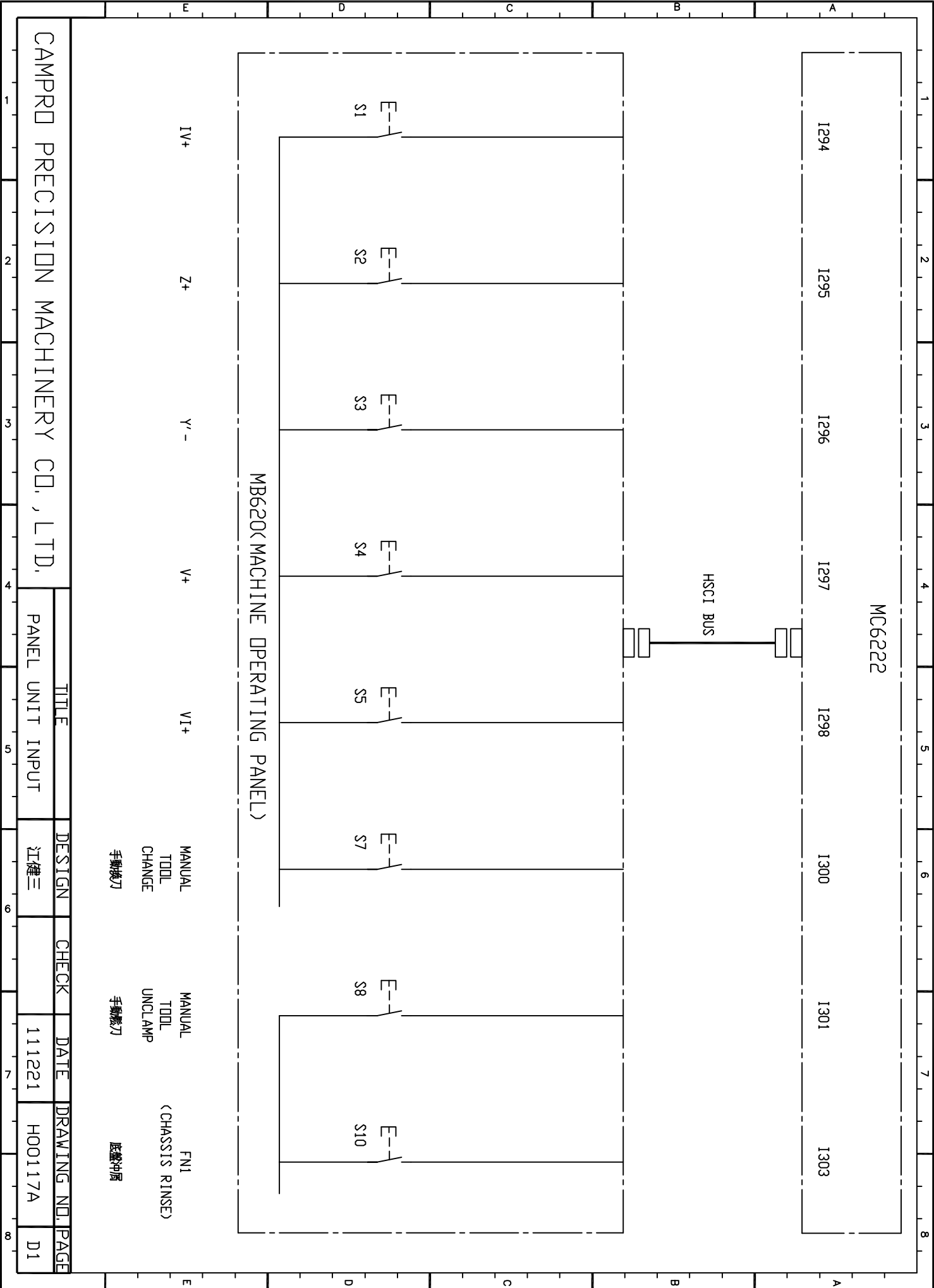
TITLE
SYSTEM CIRCUIT

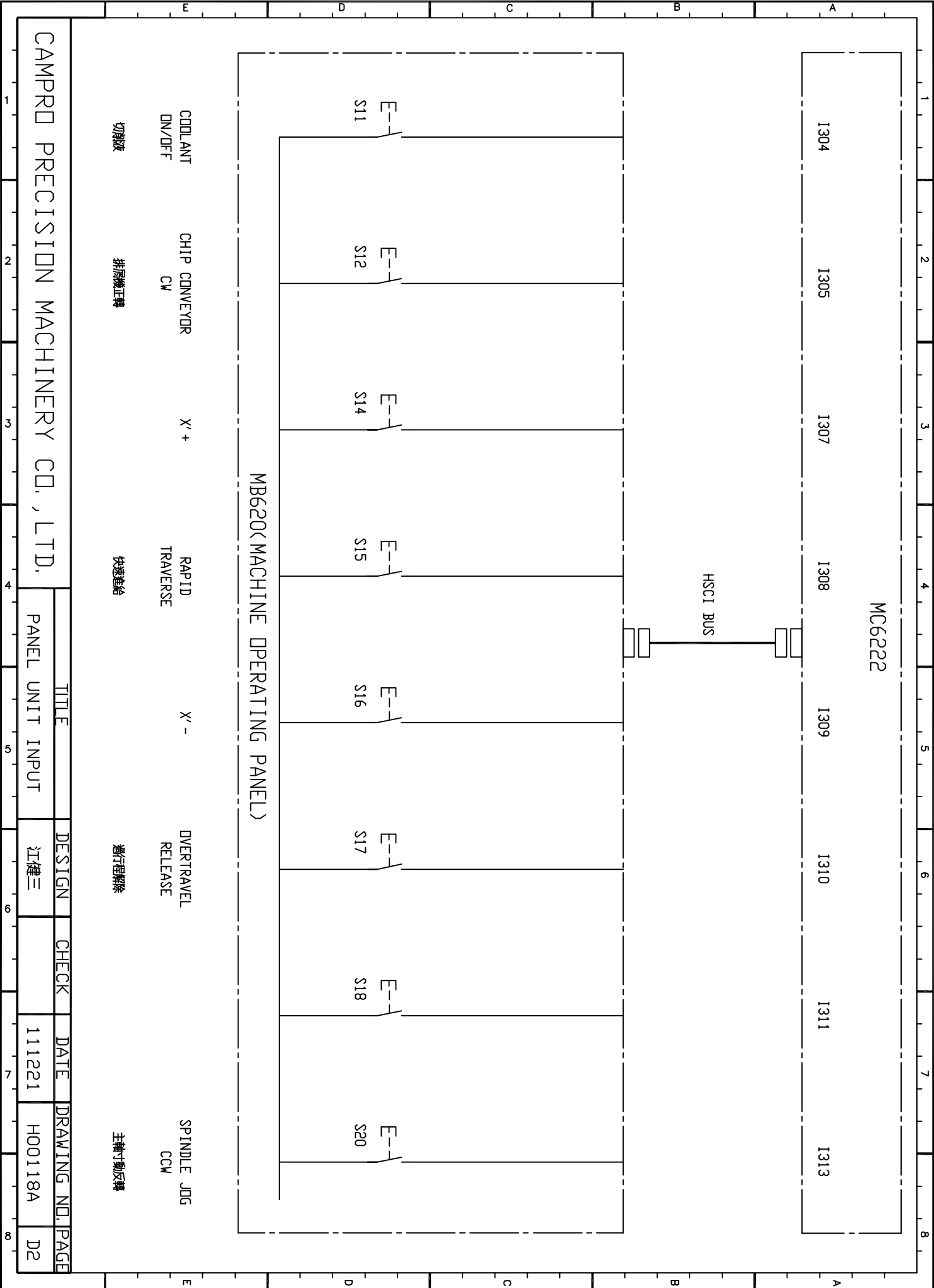
DESIGN
江健三

CHECK

DATE	11081
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DRAWING NO.	PAGE
H00116A	C3





MC6222

I304

I305

I307

I308

I309

I310

I311

I313

HSCI BUS

MB620(MACHINE OPERATING PANEL)

E--S11

E--S12

E--S14

E--S15

E--S16

E--S17

E--S18

E--S20

COOLANT
ON/OFF

CHIP CONVEYOR
CW

X'+

RAPID
TRAVERSE

X'--

OVERTRAVEL
RELEASE

SPINDLE JOG
CCW

切削液

排屑機正轉

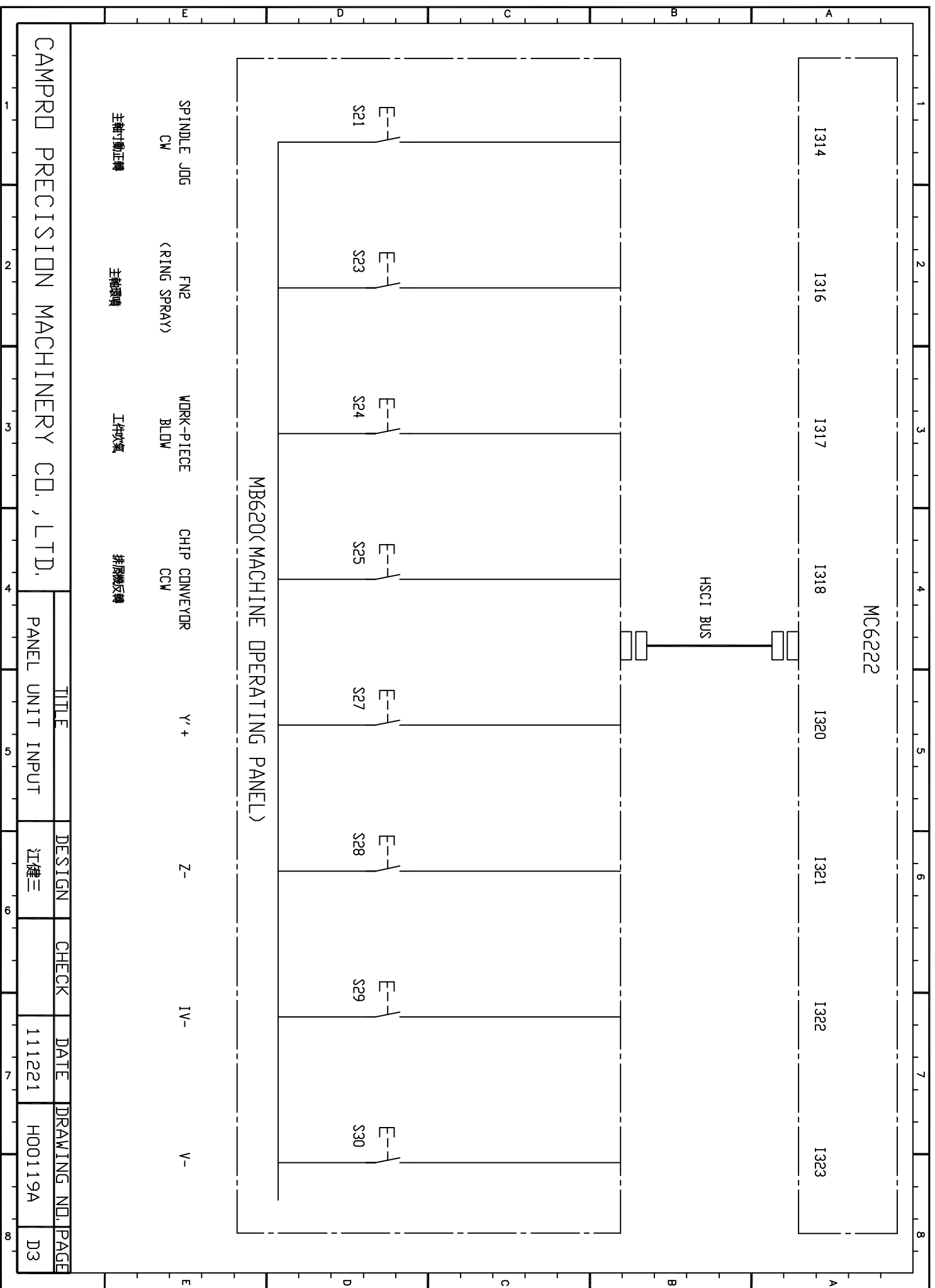
快速進給

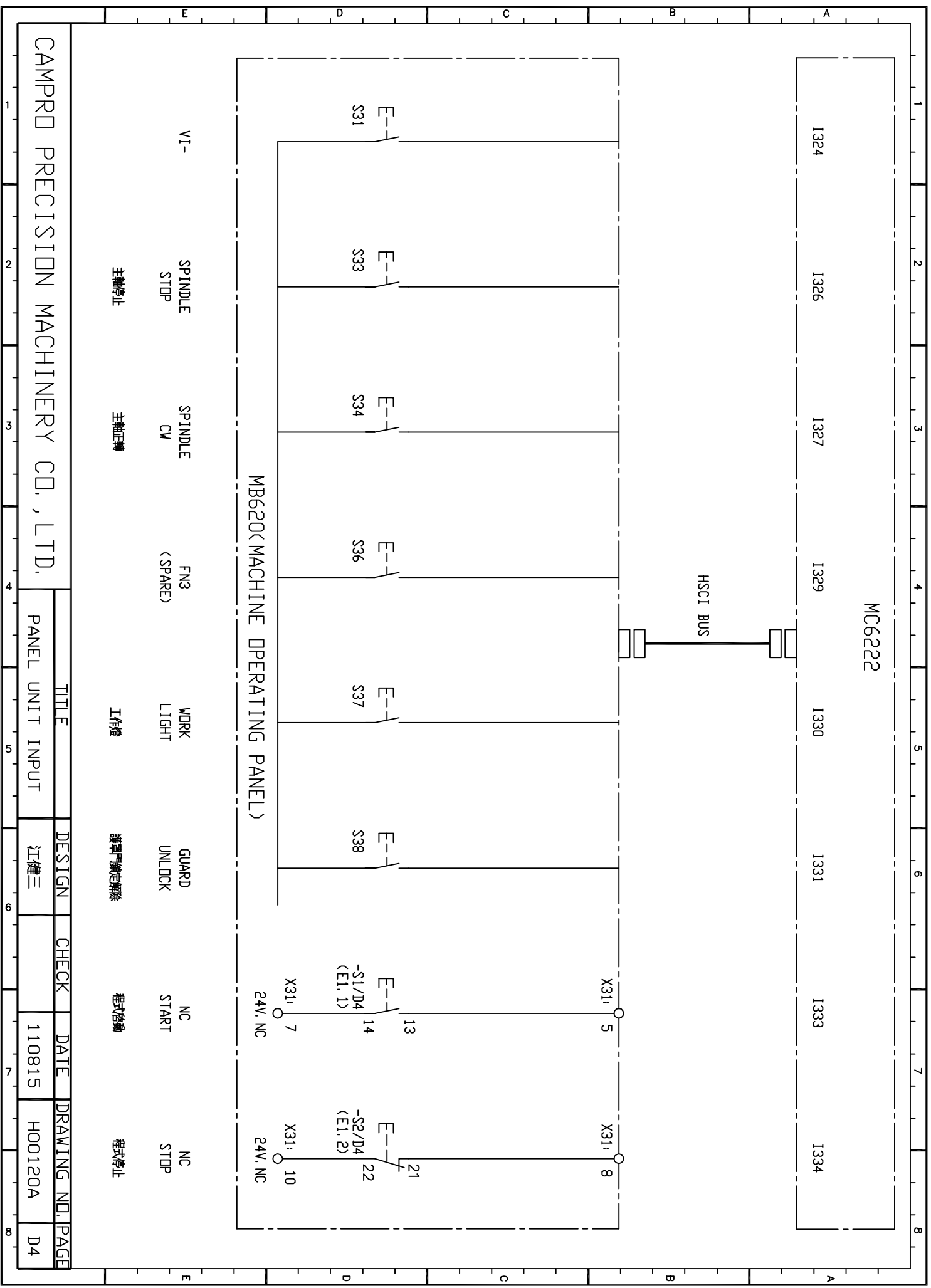
過行程解除

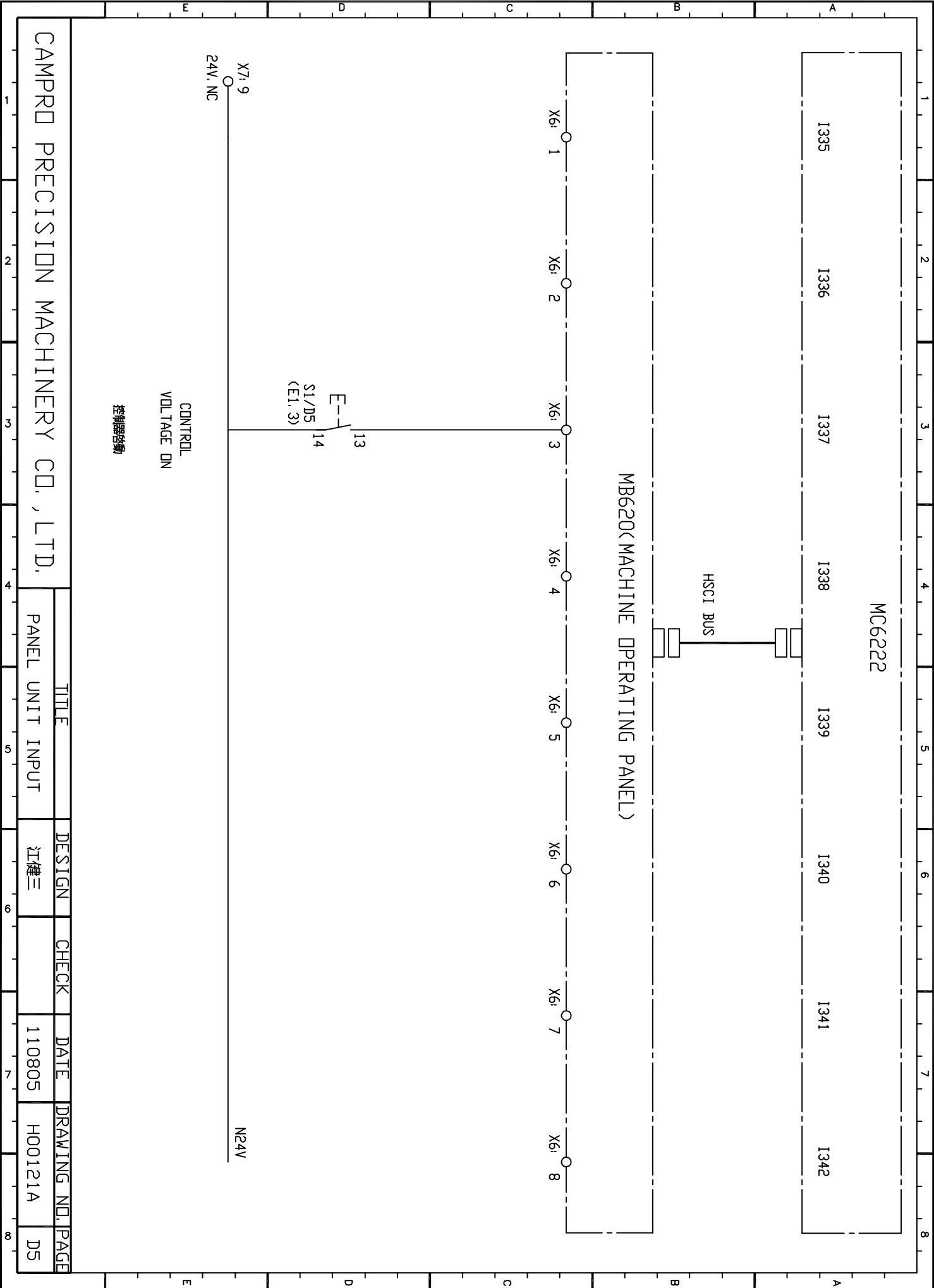
主軸寸動反轉

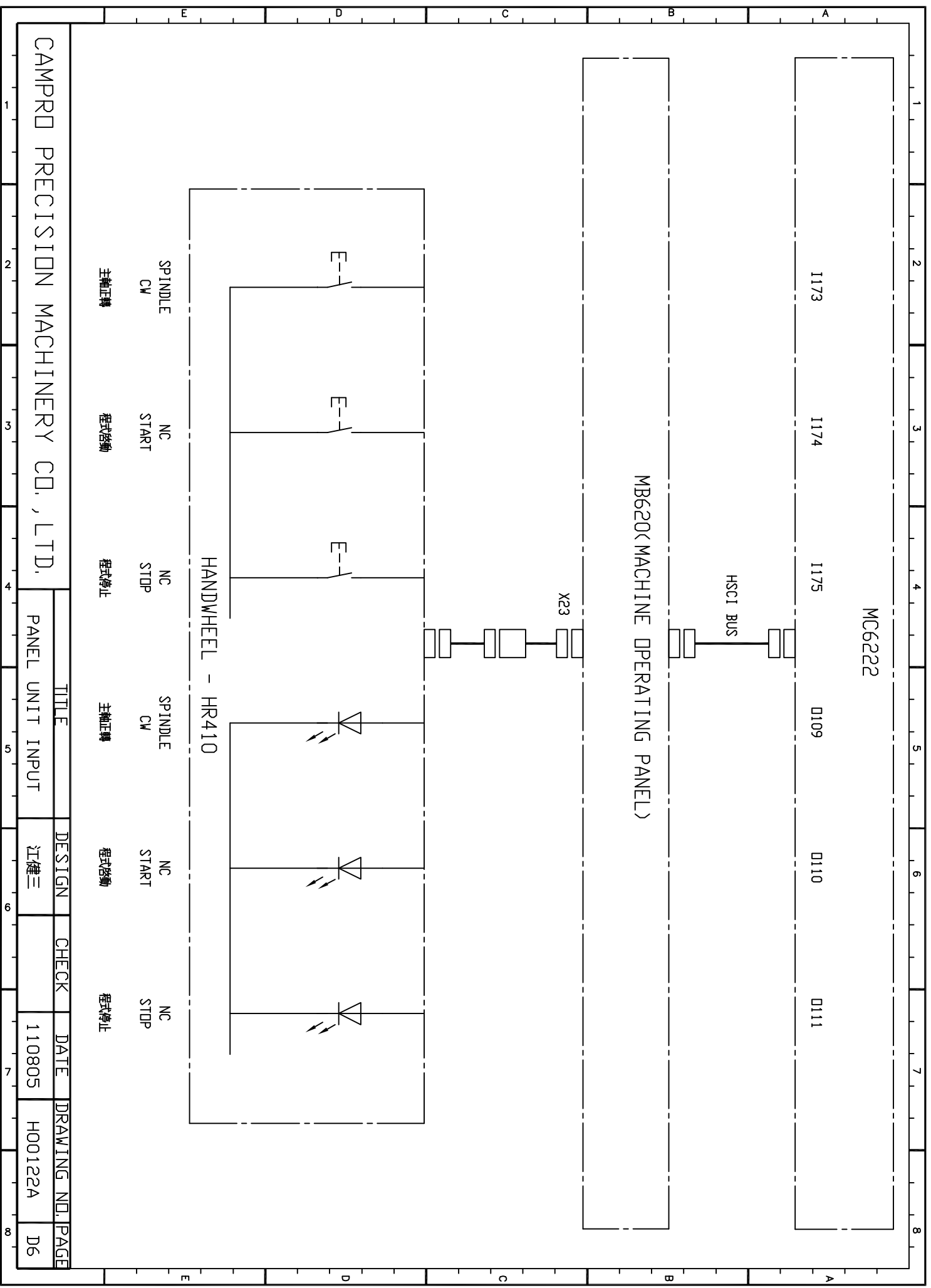
CAMPRO PRECISION MACHINERY CO., LTD.

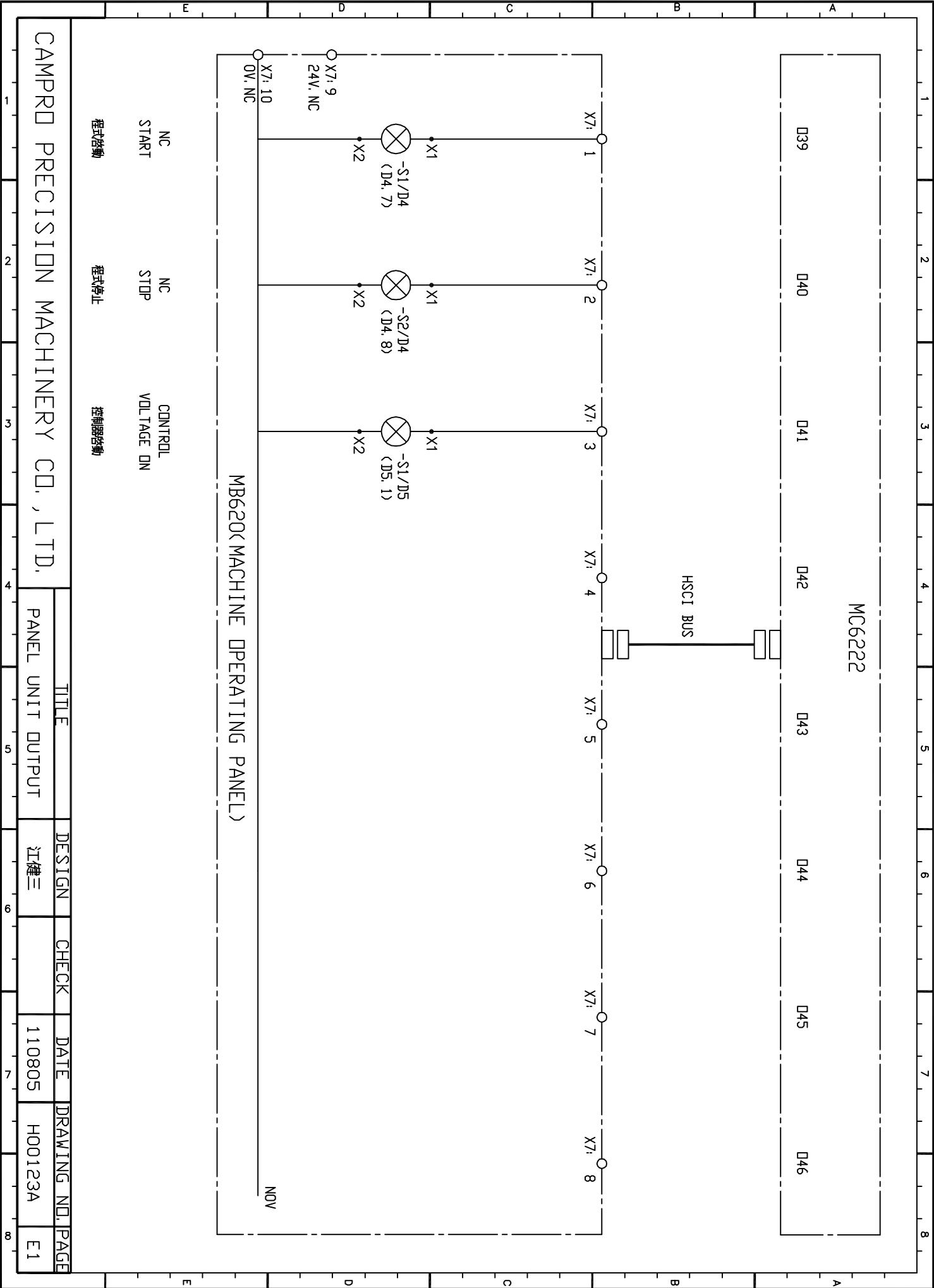
TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PANEL UNIT INPUT	江健三		111221	H00118A	D2

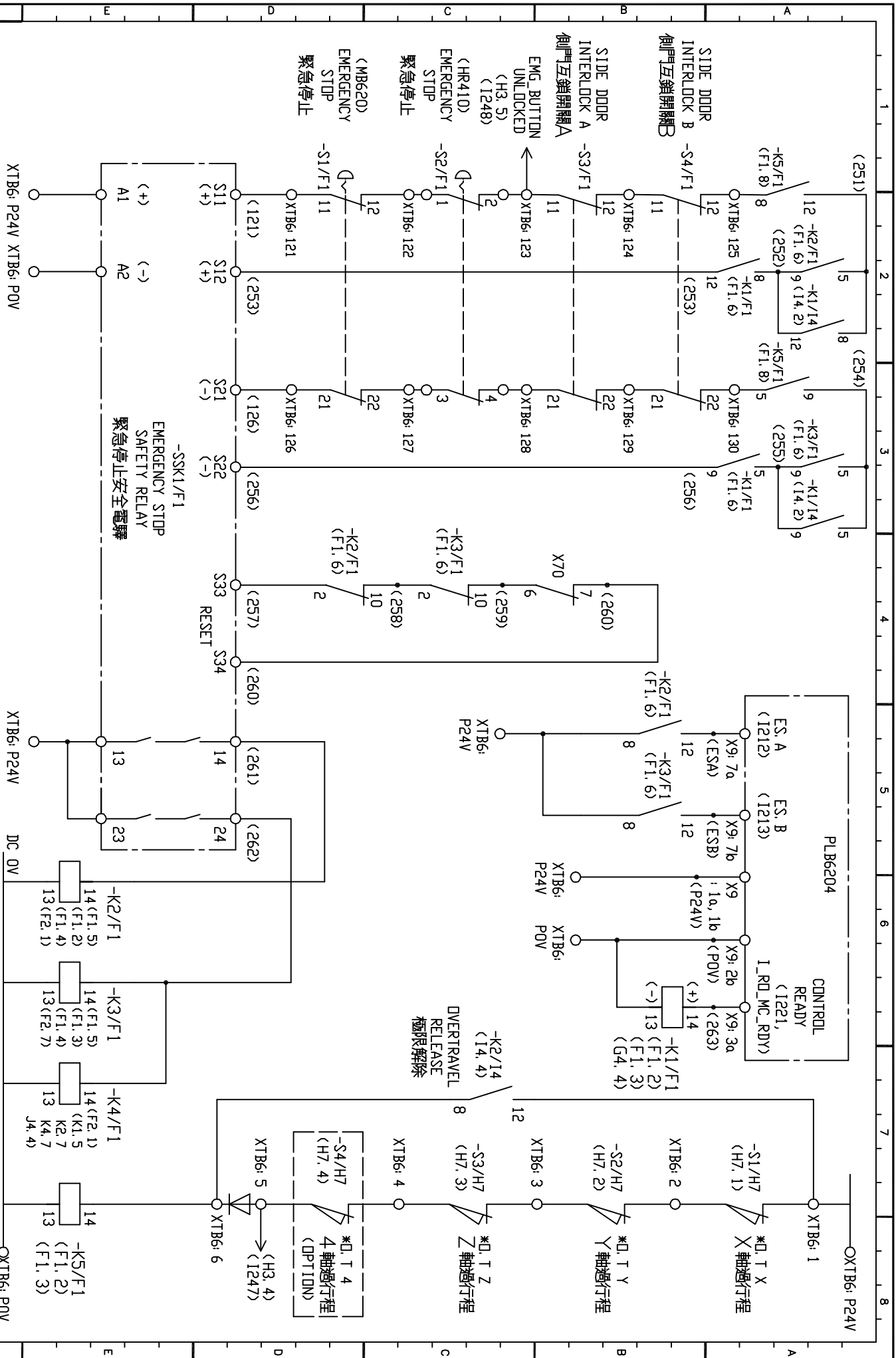






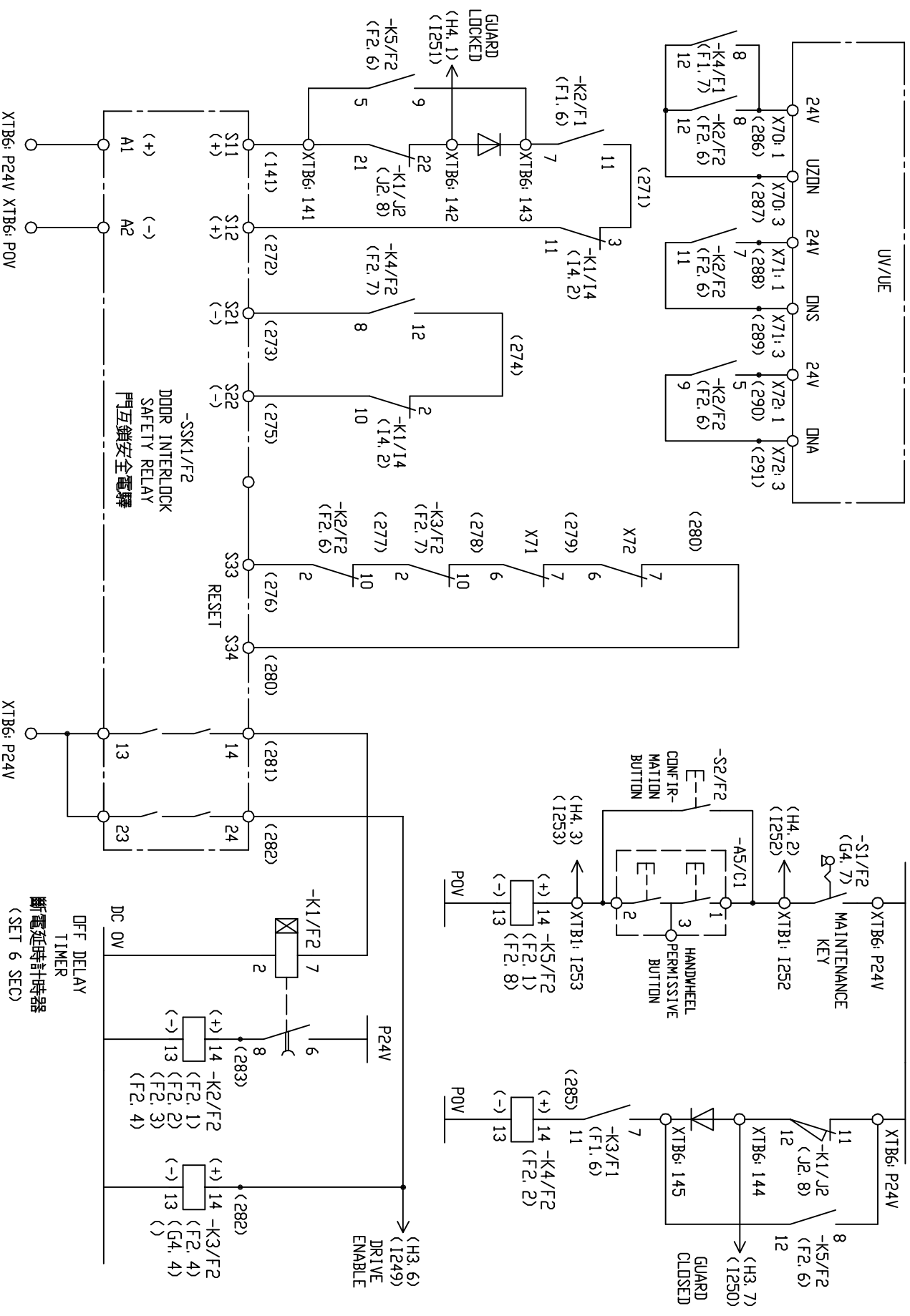






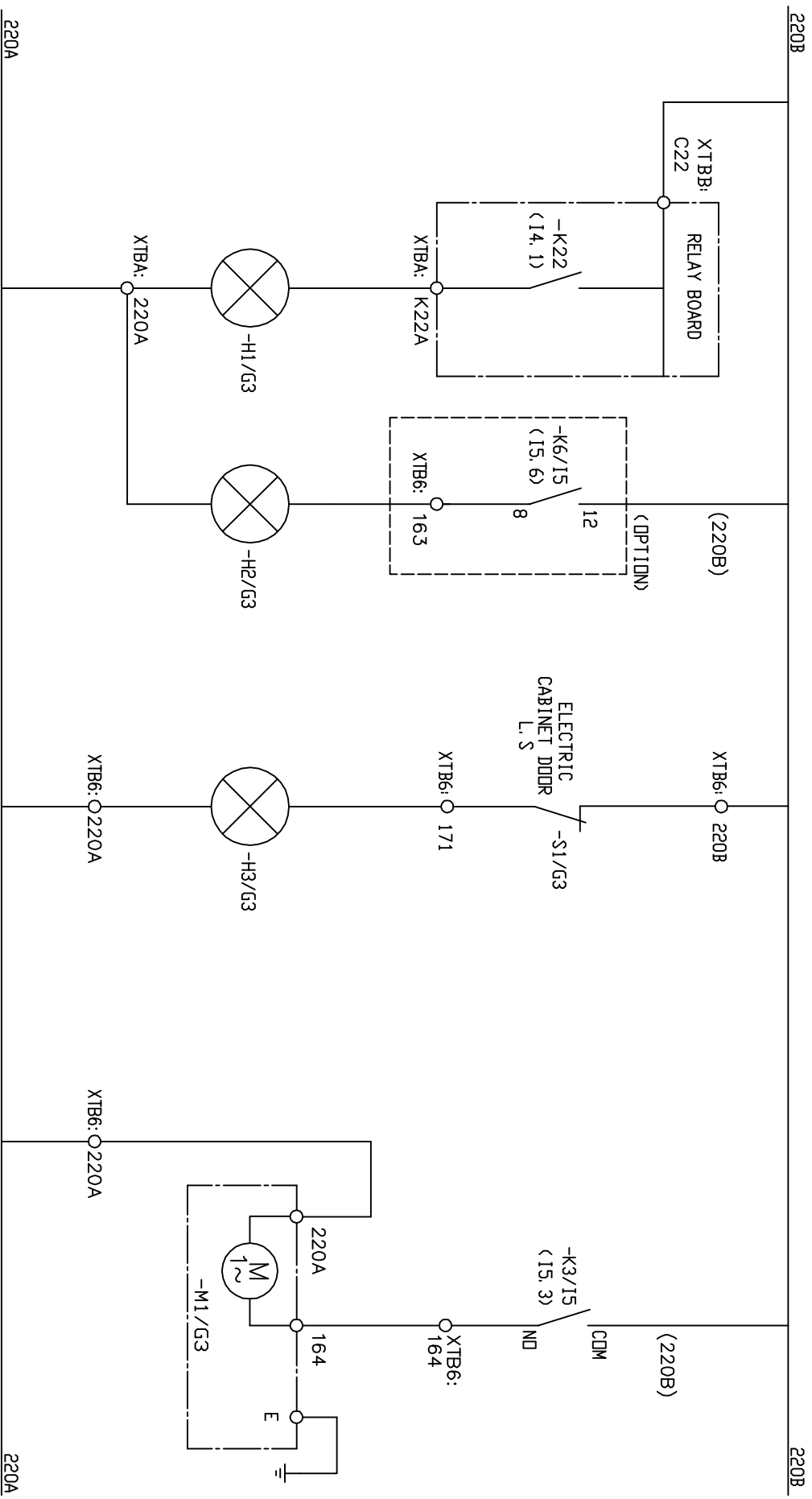
CAMPRO PRECISION MACHINERY CO., LTD.

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
EMERGENCY CIRCUIT	江健三		111107	H00124A	F 1



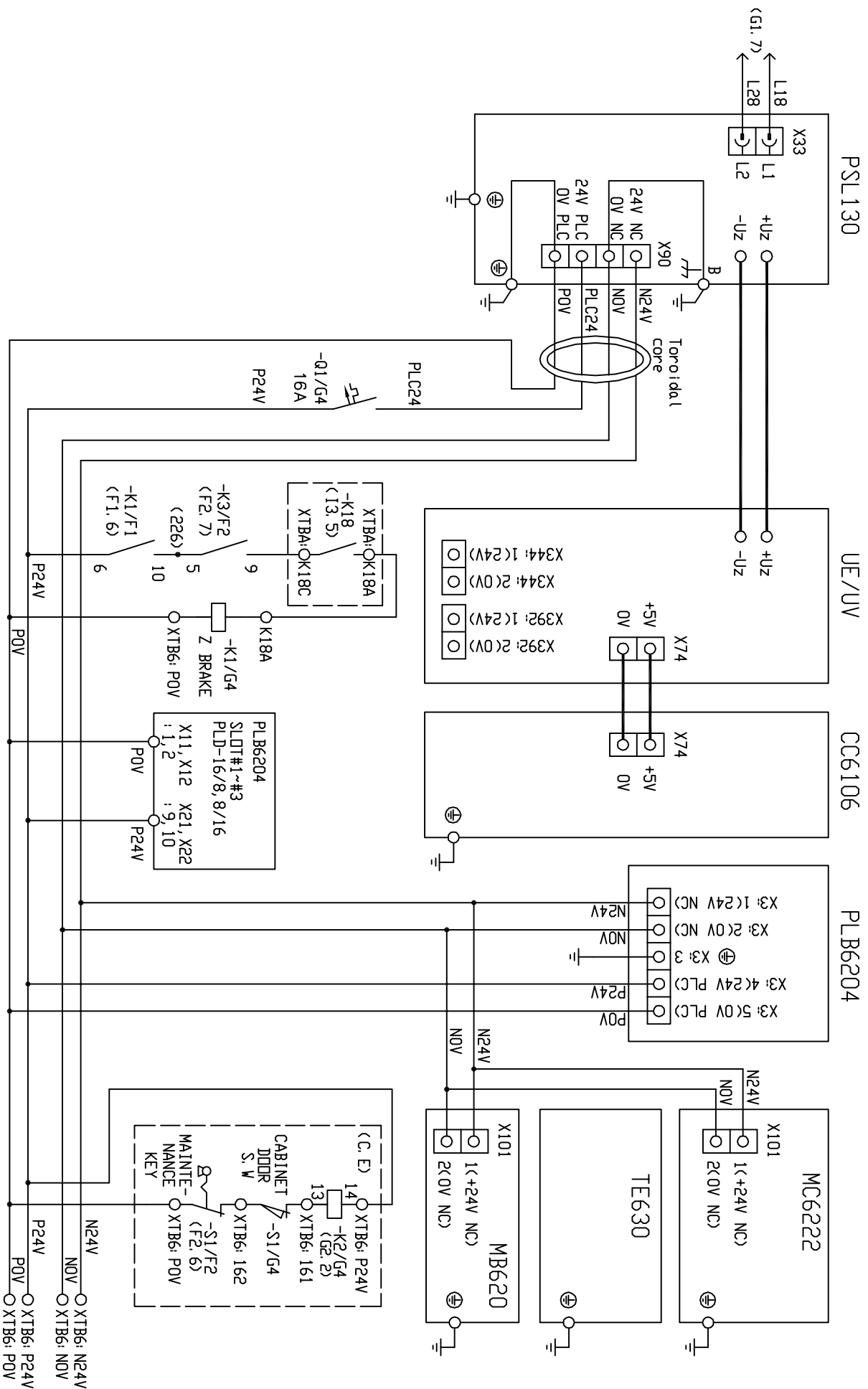
CAMPRD PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
EMERGENCY CIRCUIT		江健三		111221	H00125A	F2



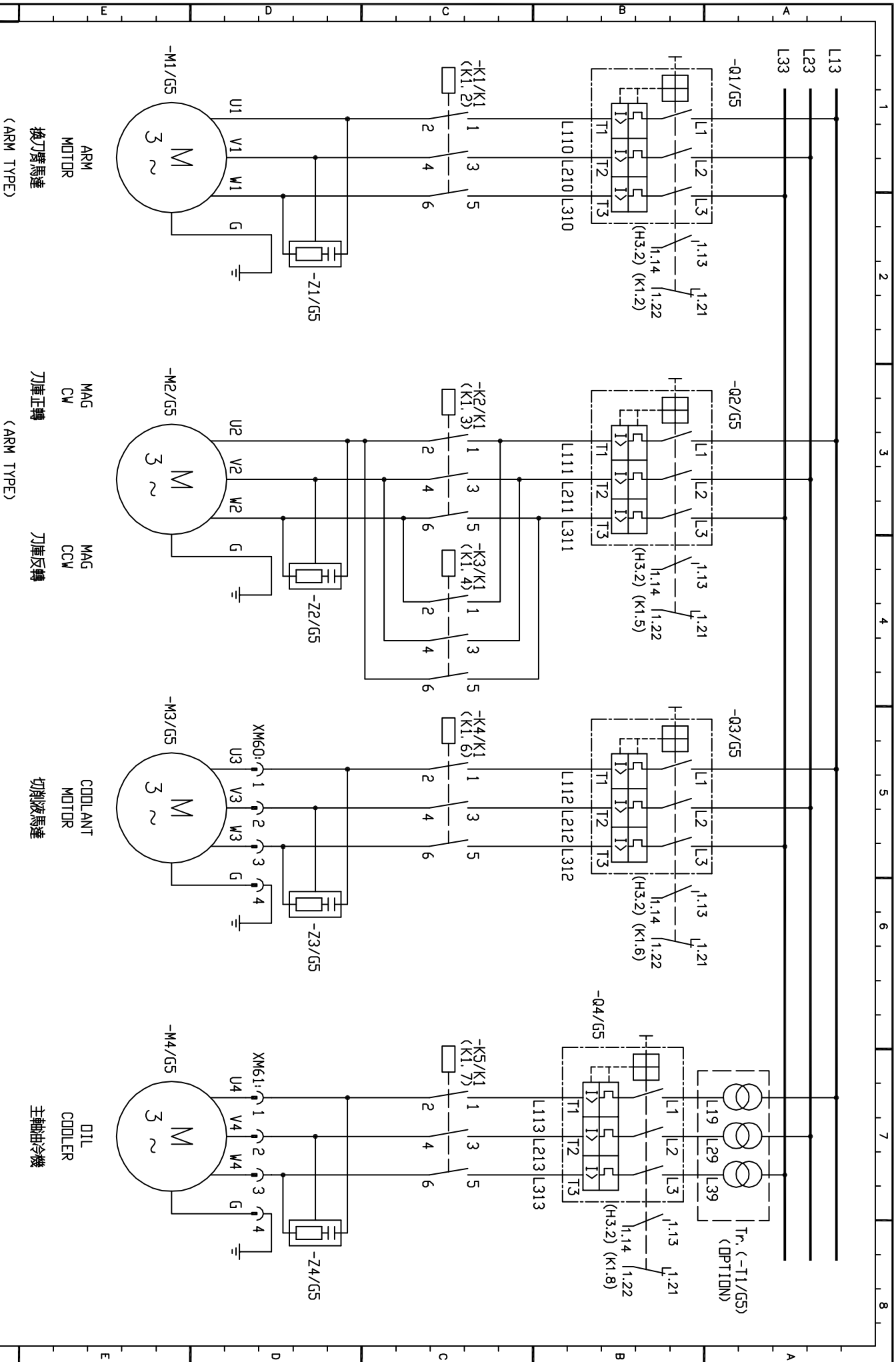
CAMPRD PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER		江健三		110815	H00128A	G3



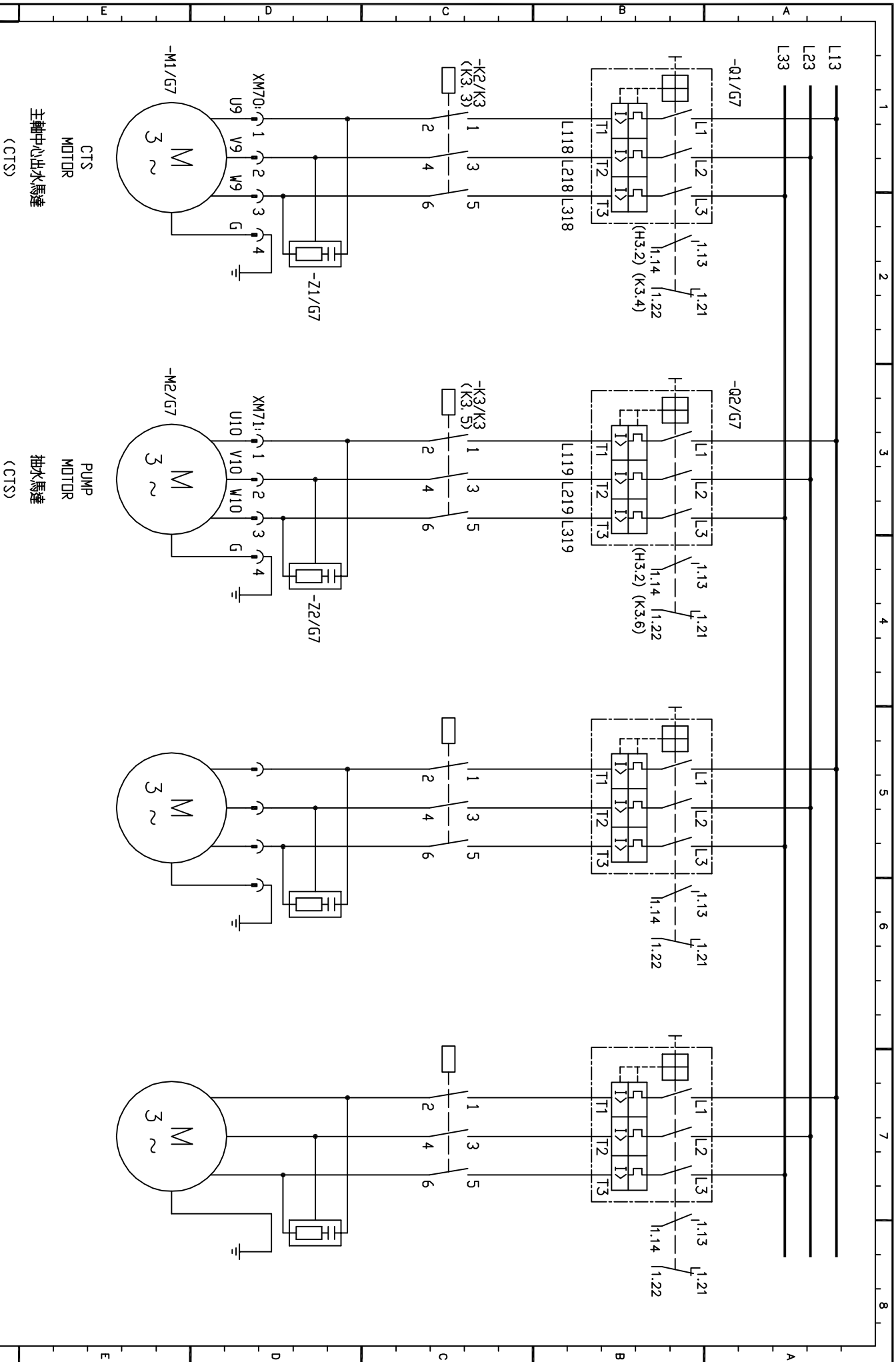
CAMPRO PRECISION MACHINERY CO., LTD.

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER	江健三		111221	H00129A	G4



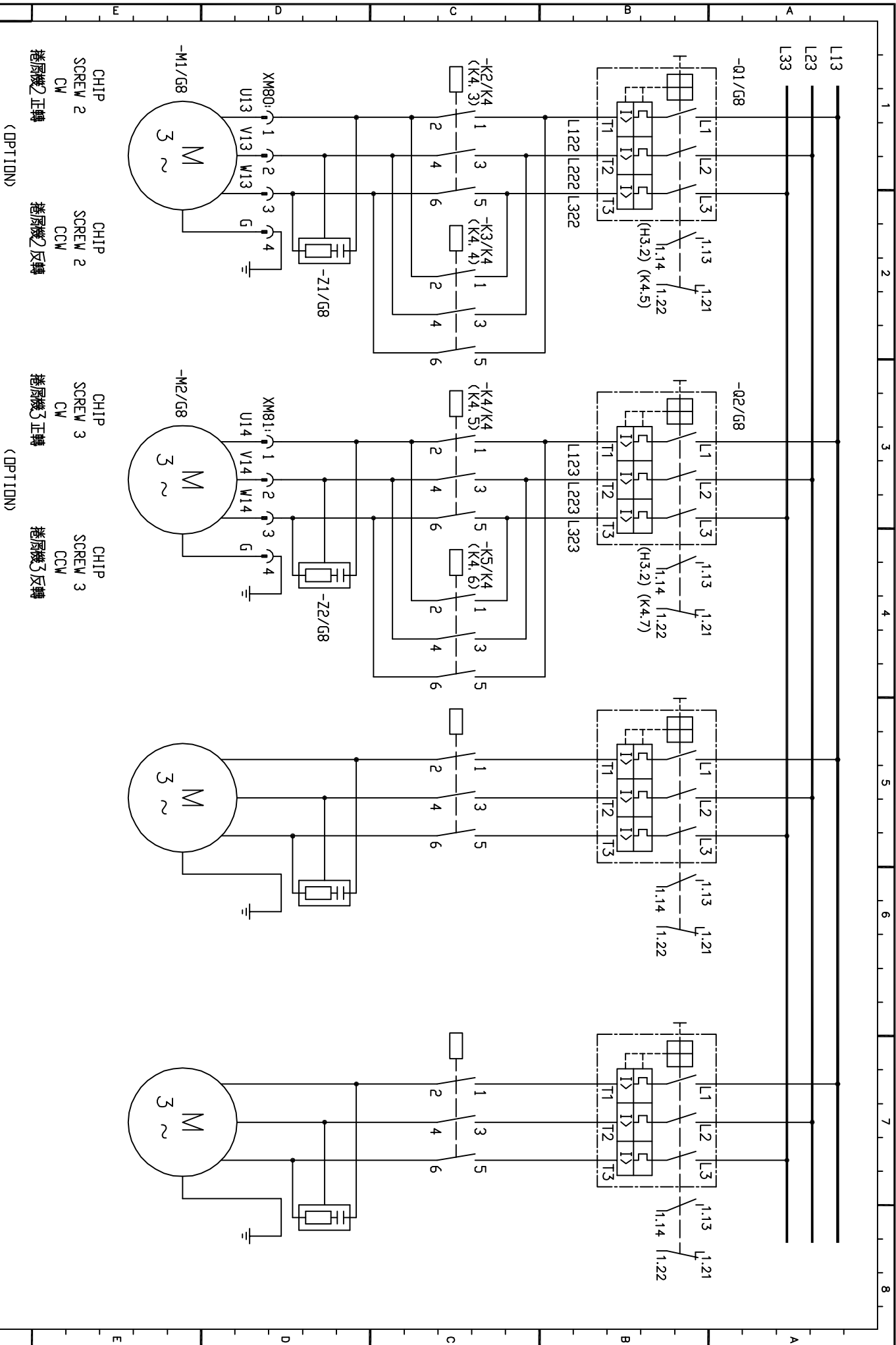
CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER		江健三		110815	H00130A	G5



CAMPRO PRECISION MACHINERY CO., LTD.

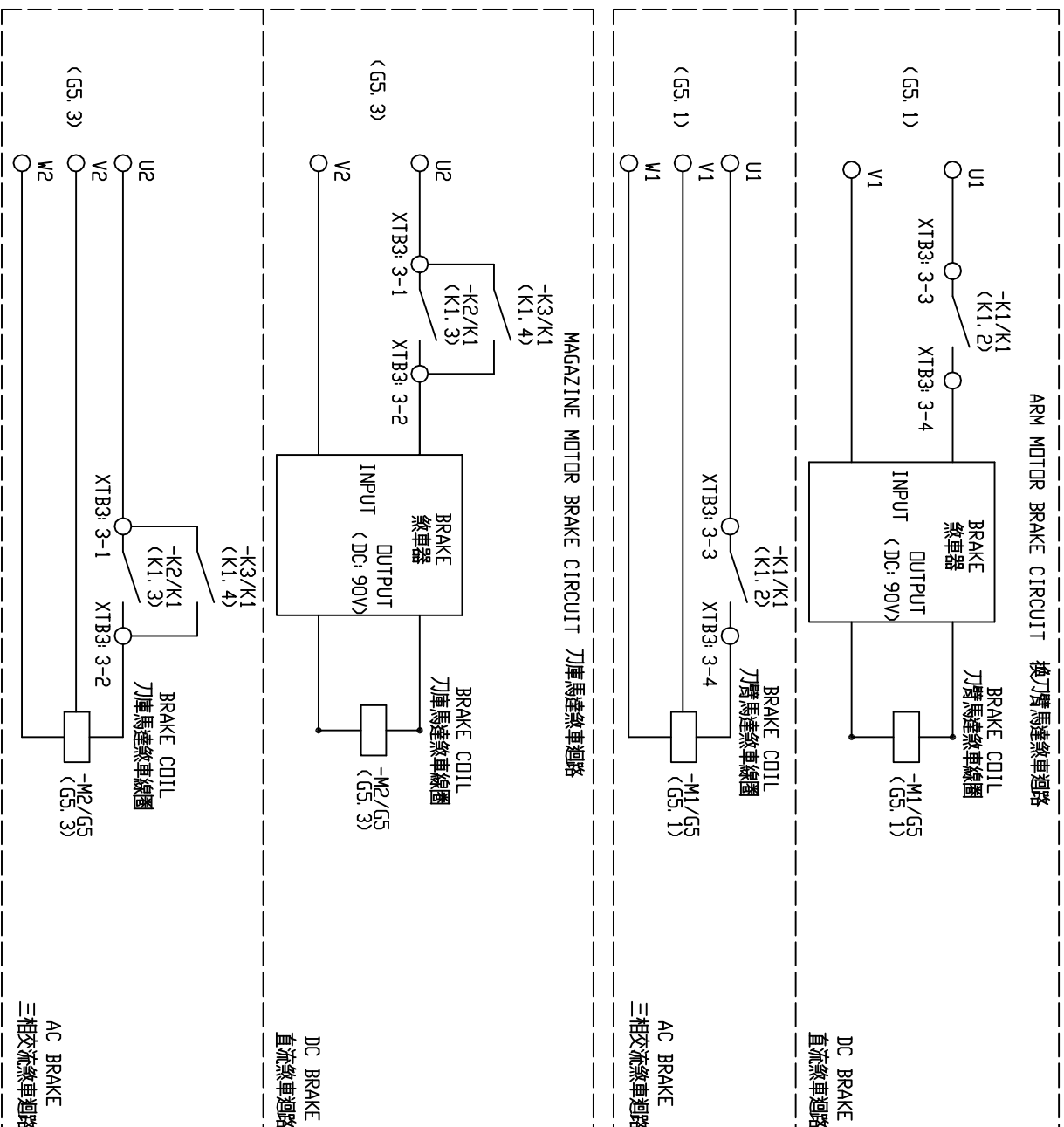
TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER		江健三		110815	H00132A	G7



CAMPRD PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER		江健三		110815	H00133A	G8

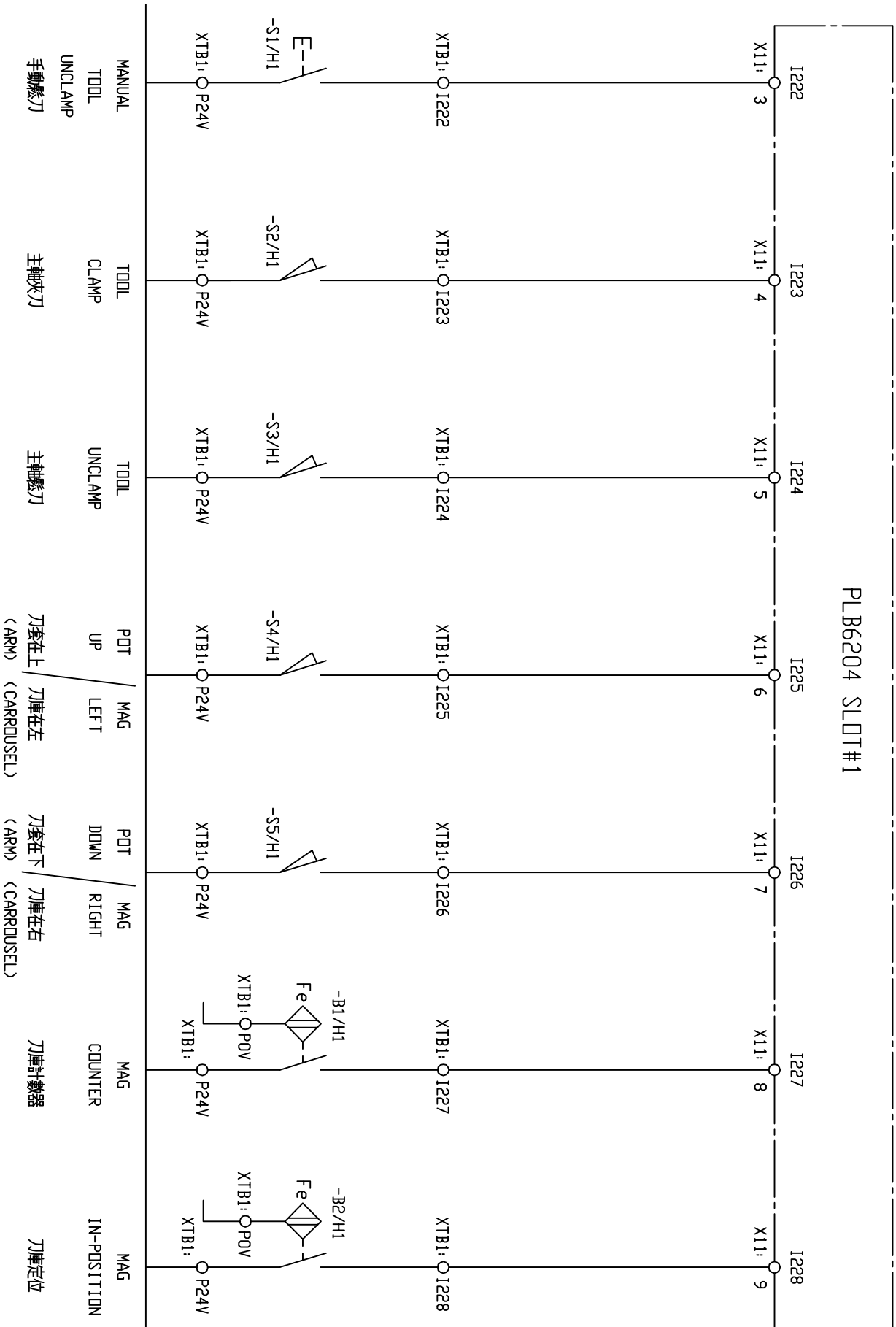
ARM/MAGAZINE MOTOR BRAKE CIRCUIT FOR ARM TYPE
换刀臂式之刀臂 / 刀庫馬達煞車迴路



CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
PERIPHERAL POWER		江健三		111221	H00134A	G9

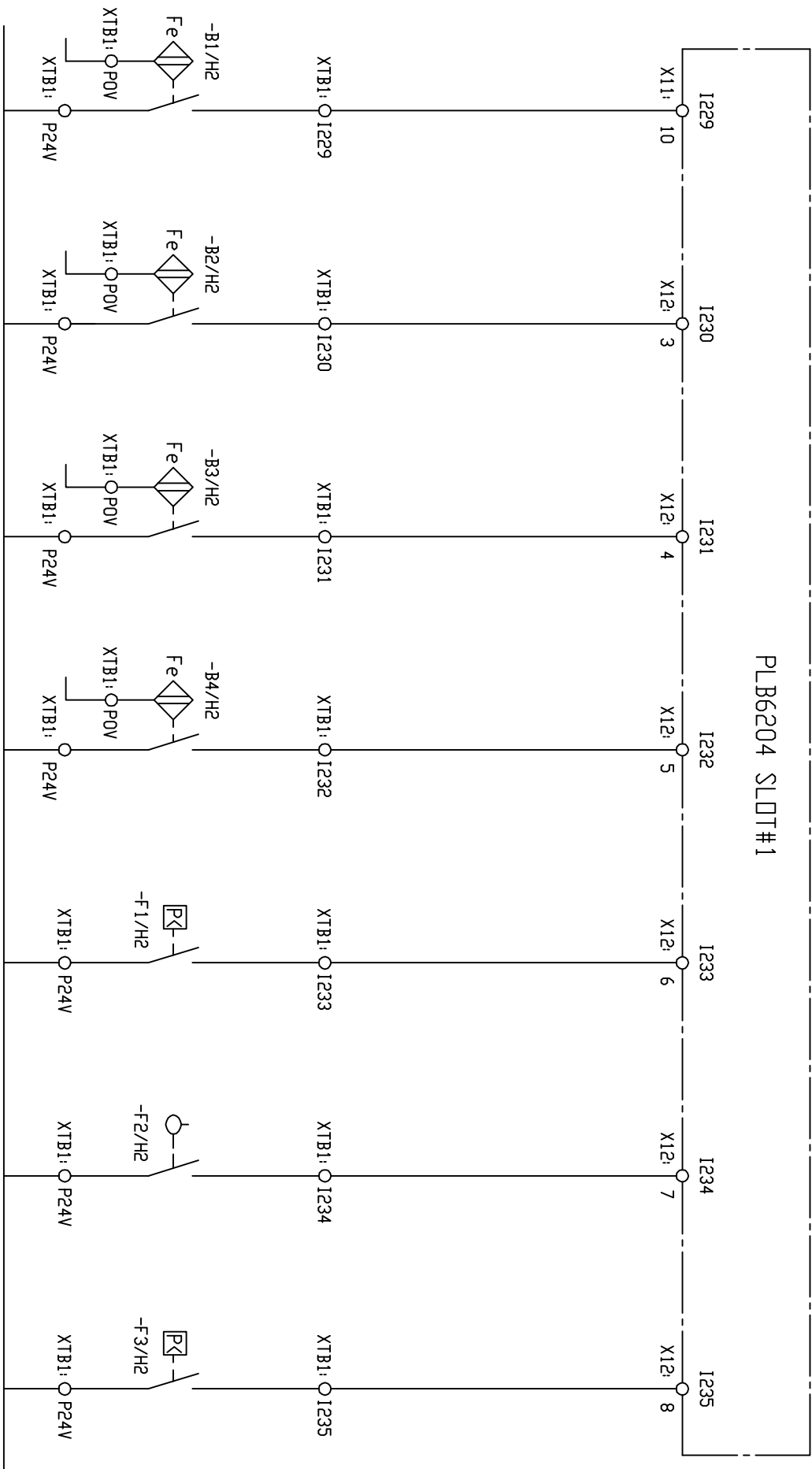
PLB6204 SLOT#1



CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT INPUT		江健三		110805	H00135A	H1

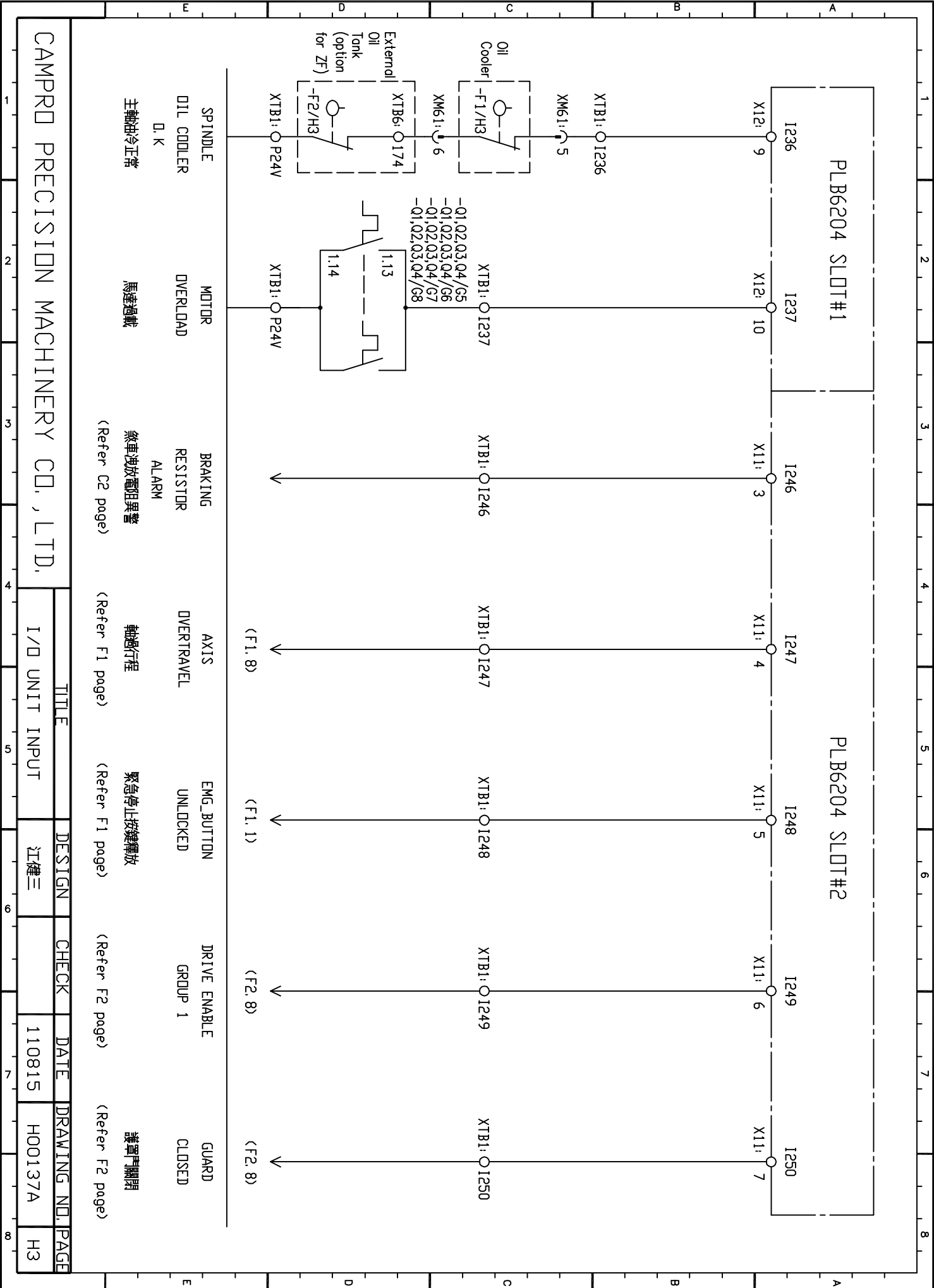
PLB6204 SLOT#1



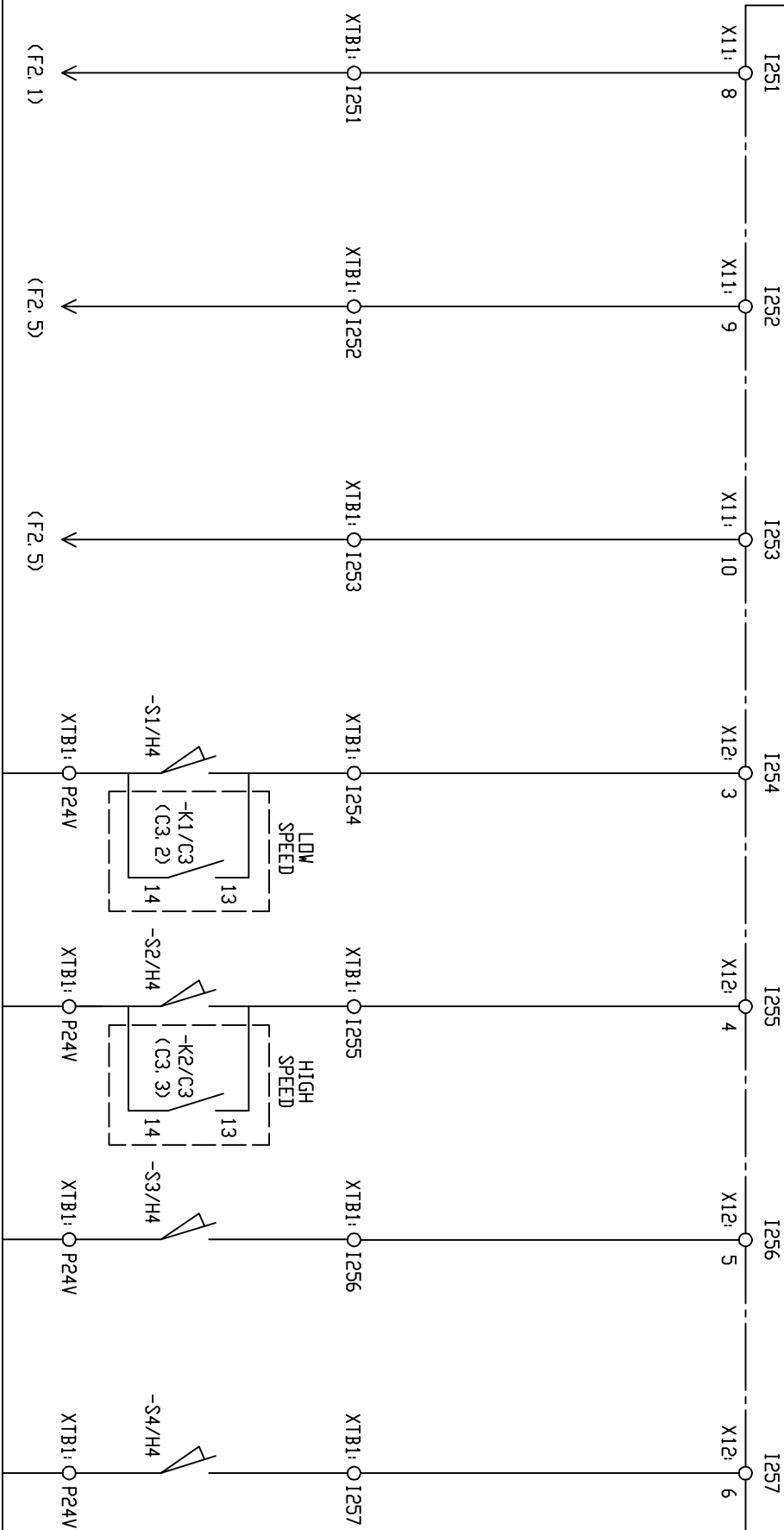
ARM	ARM	ARM	ARM	ARM	AIR	LUBE	LUBE
STOP	CLIP	UNCLAMP	DRIGIN	CHECK	PRESSURE D. K	LEVEL D. K	PRESSURE
POINT	POINT	POINT	POINT	POINT			
换刀臂停止点	换刀臂待刀点	换刀臂鬆刀点	换刀臂原点	换刀臂凸輪點	氣壓壓力正常	潤滑油液位正常	潤滑油壓力檢知
(FAST ATC)				(FAST ATC)			

CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT INPUT		江健三		110805	H00136A	H2

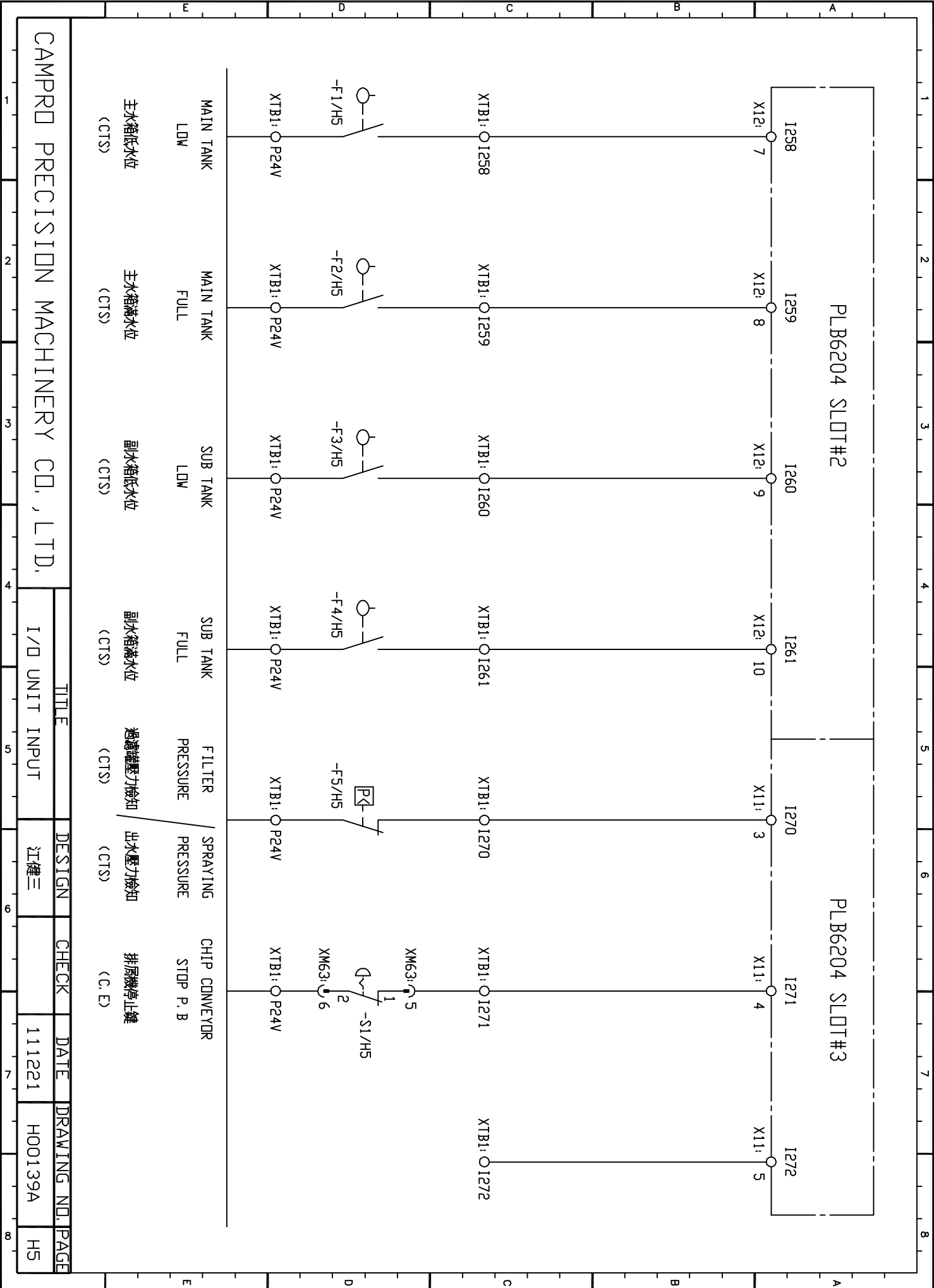


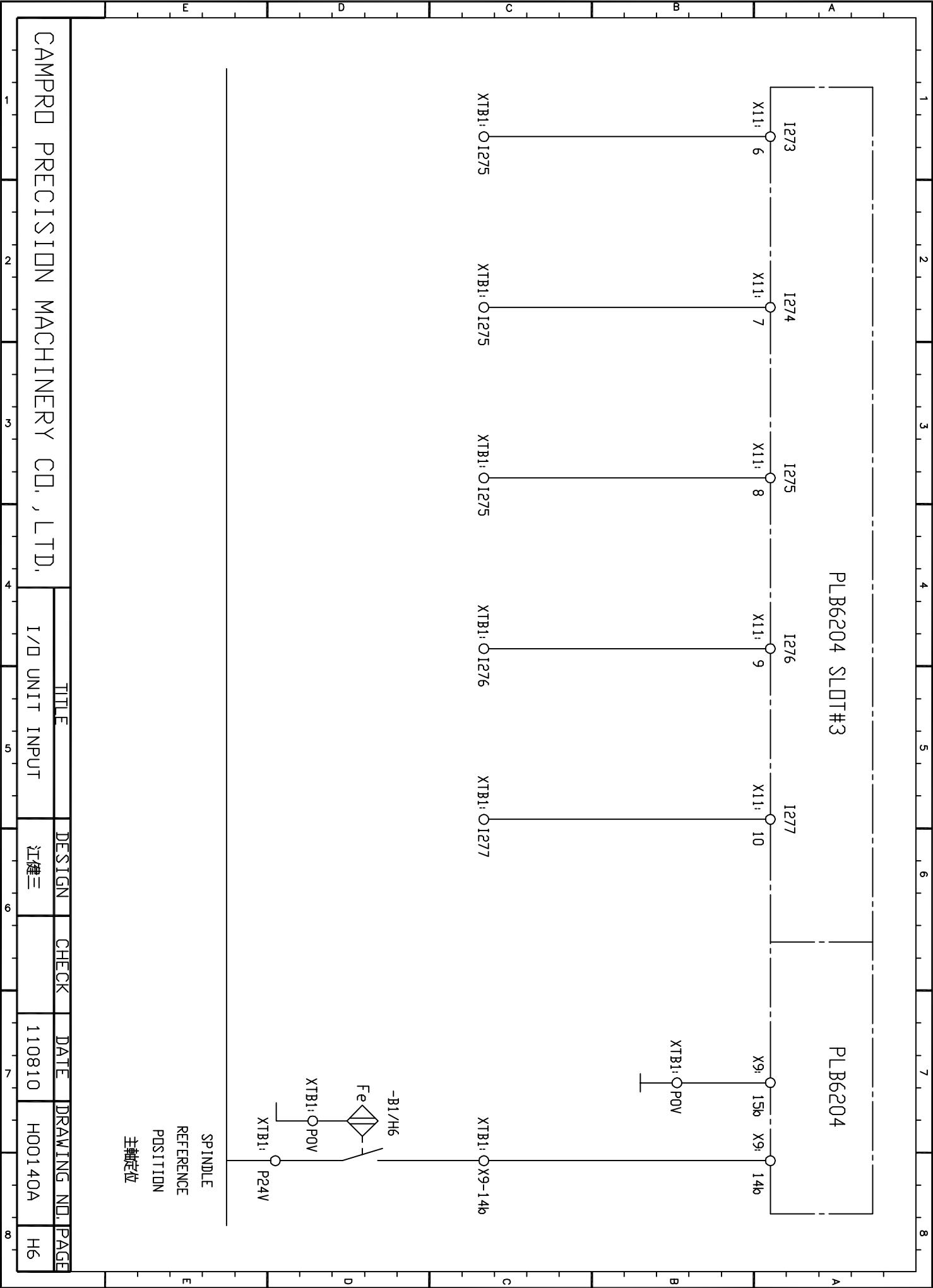
PLB6204 SLOT#2

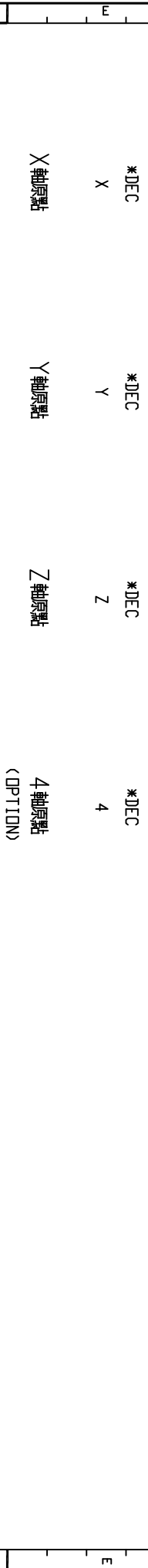
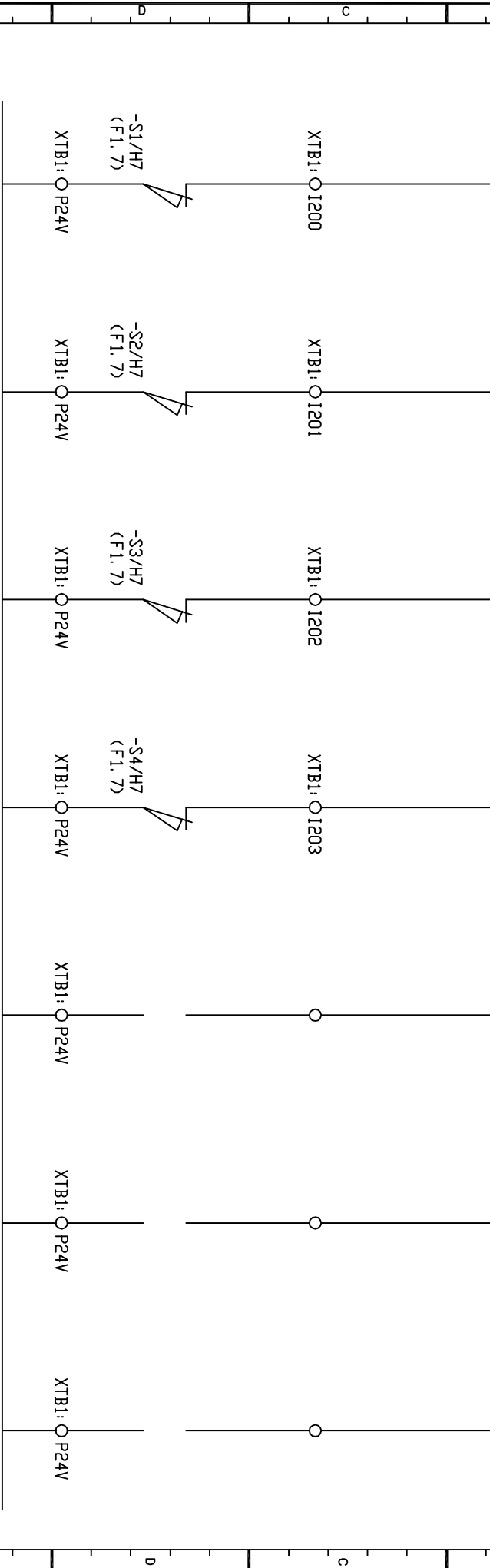
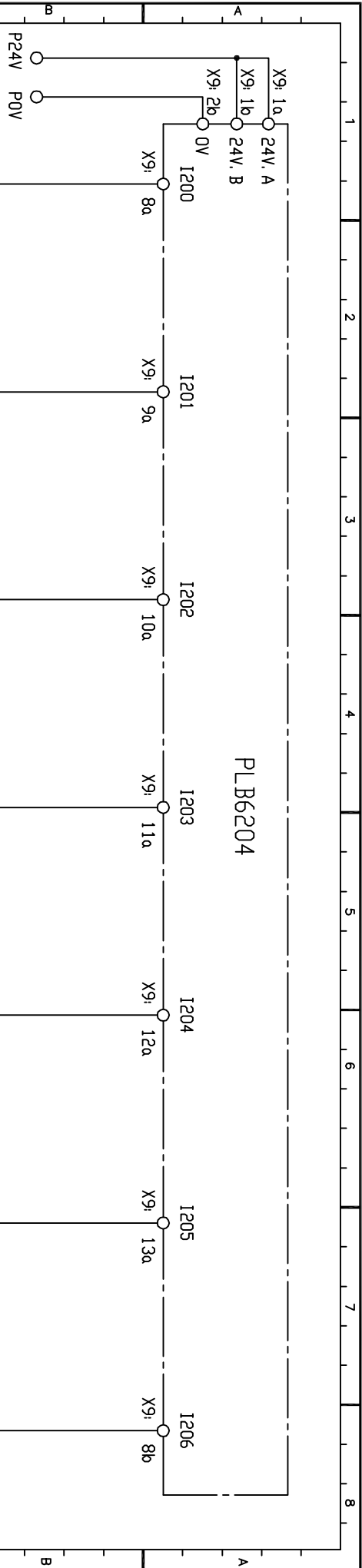


CAMPRO PRECISION MACHINERY CO., LTD.

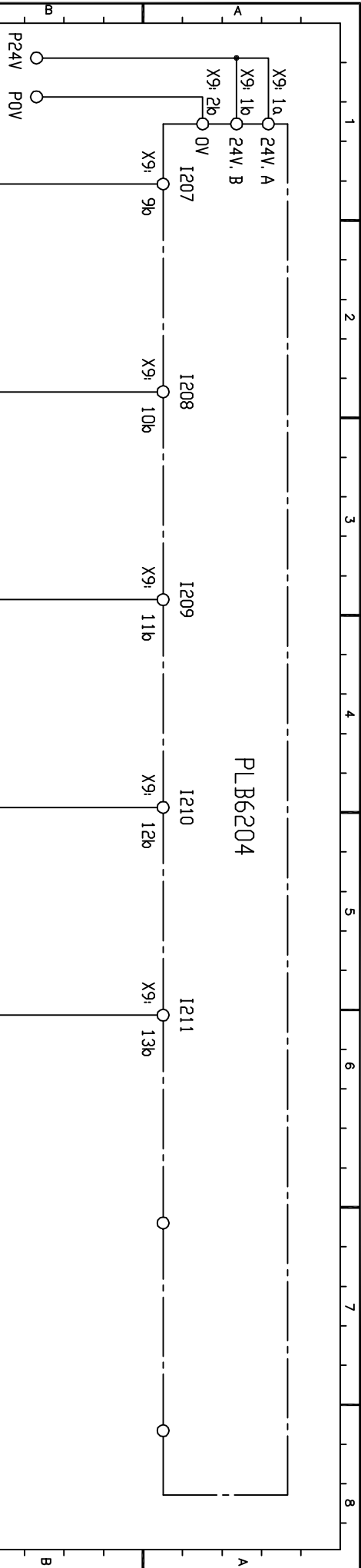
TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT INPUT		江健三		110810	H00138A	H4







CAMPRD PRECISION MACHINERY CO., LTD.				TITLE			
I/O UNIT INPUT				DESIGN			
				CHECK			
				DATE			
				DRAWING NO.			
				PAGE			

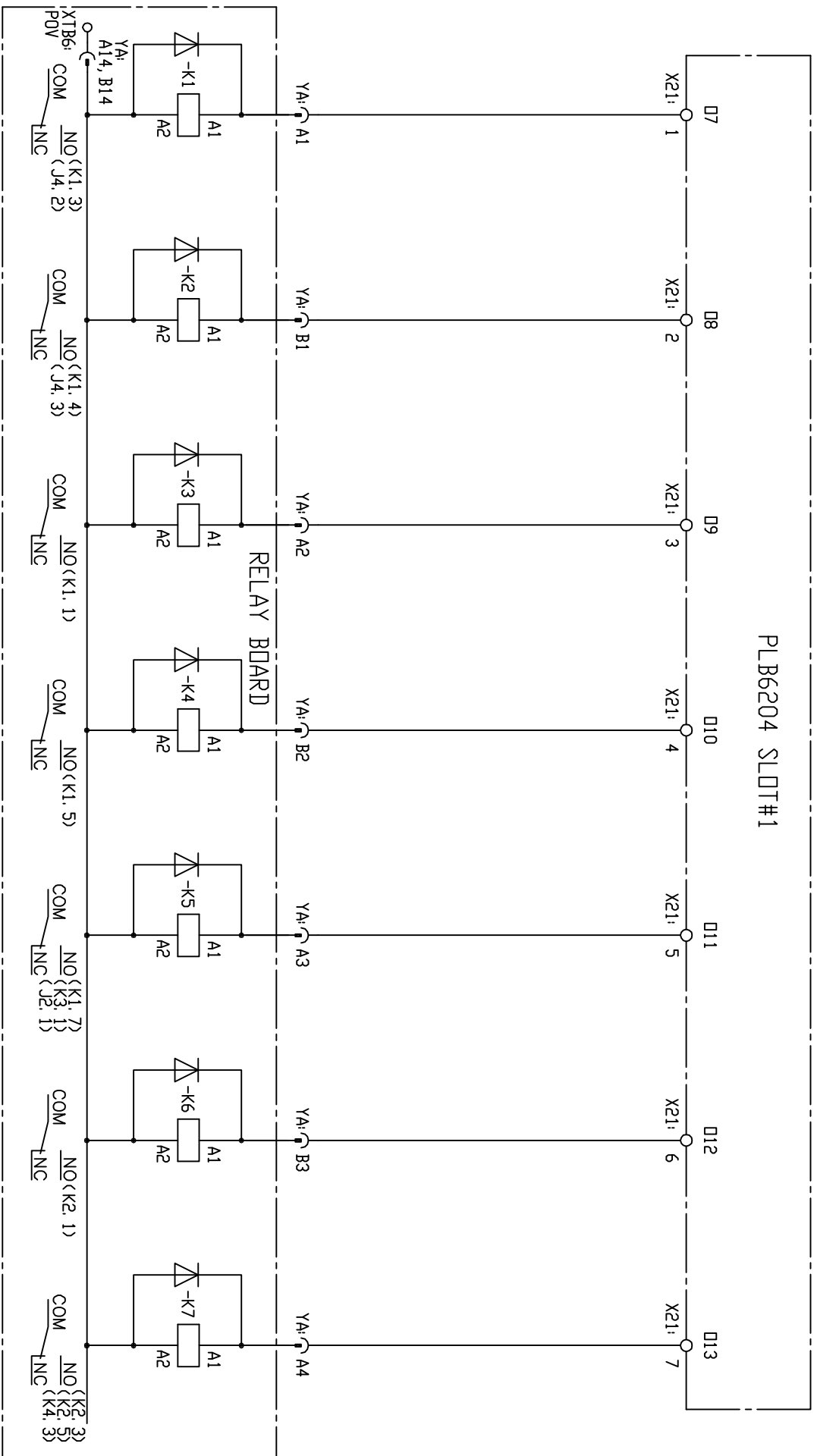


PLB6204

CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT INPUT		江健三		110805	H00142A	H8

PLB6204 SLOT#1



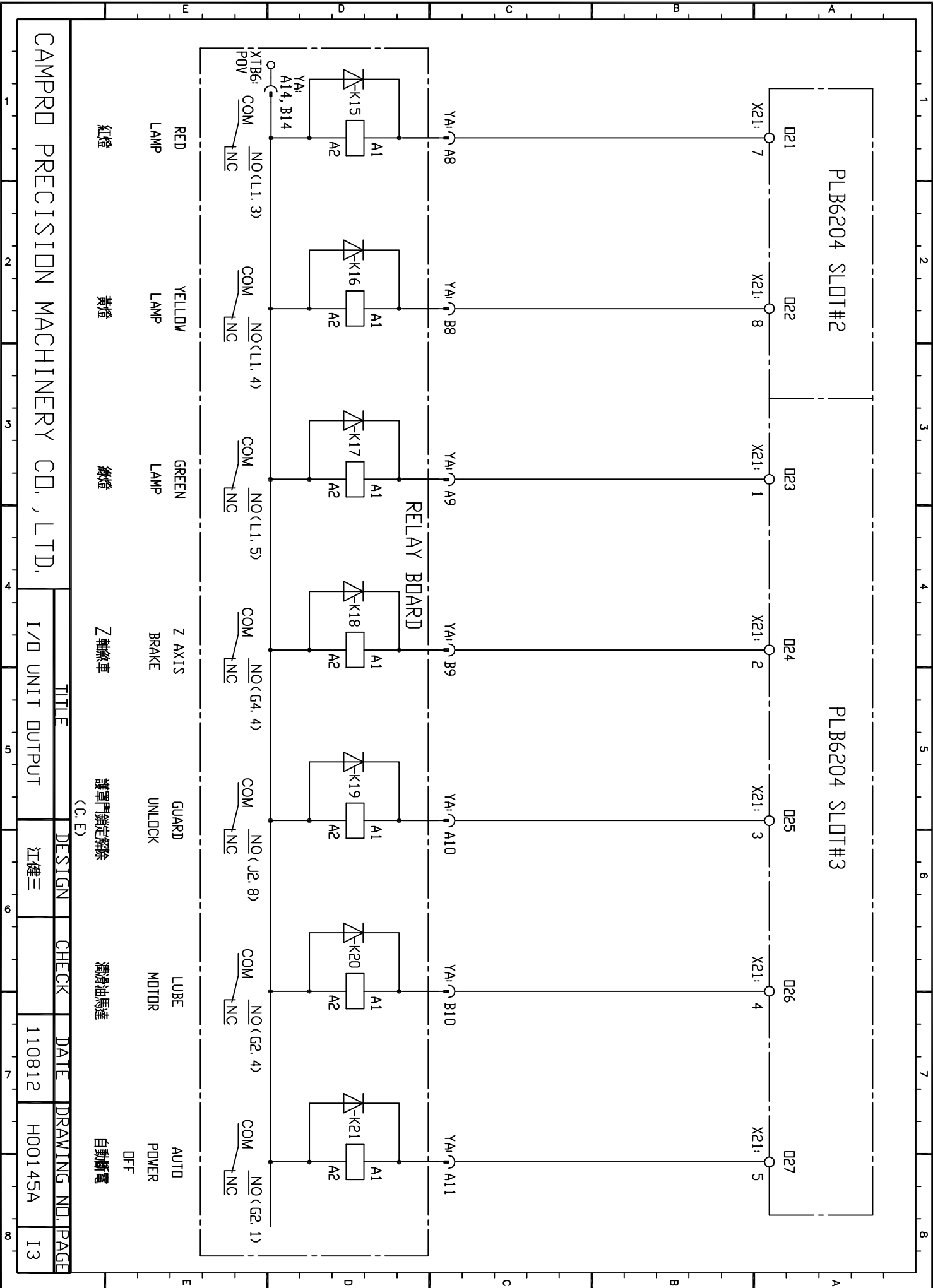
MAG MAG ARM
CW CCW MOTOR
刀庫正轉 刀庫反轉 換刀臂馬達

COOLANT MOTOR
DIL COOLER HYDRAULIC SPINDLE
MOTOR Labyrinth BLOW
主軸油冷機 油壓馬達 主軸吹宮吹氣

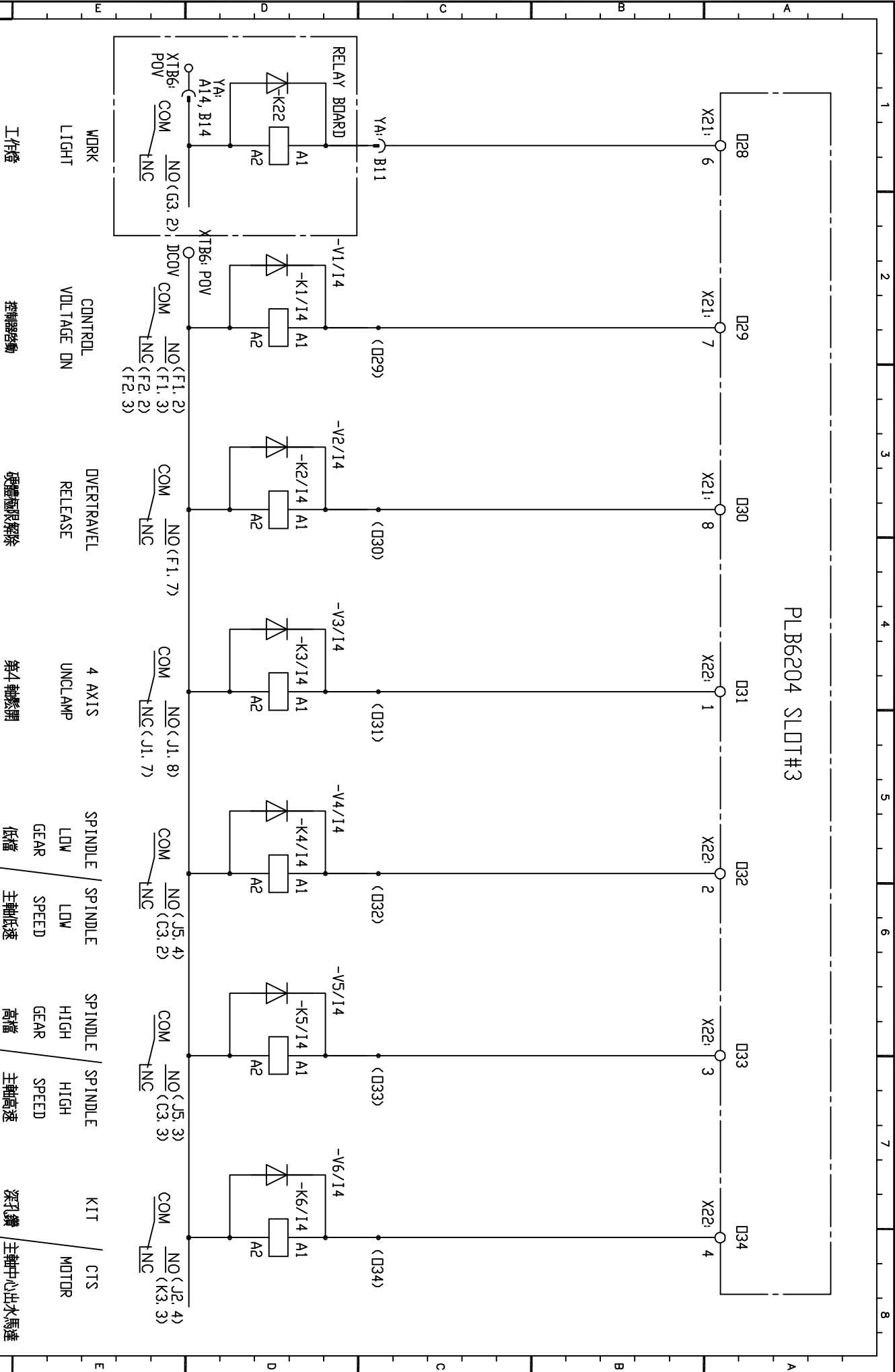
CHASSIS RINSE CHIP CHIP
FWD CONVEYER SCREW
CW FORWARD
排屑機前送 捲屑機正轉
底盤沖屑 (OPTION)

CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT OUTPUT		江健三		110812	H00143A	I 1

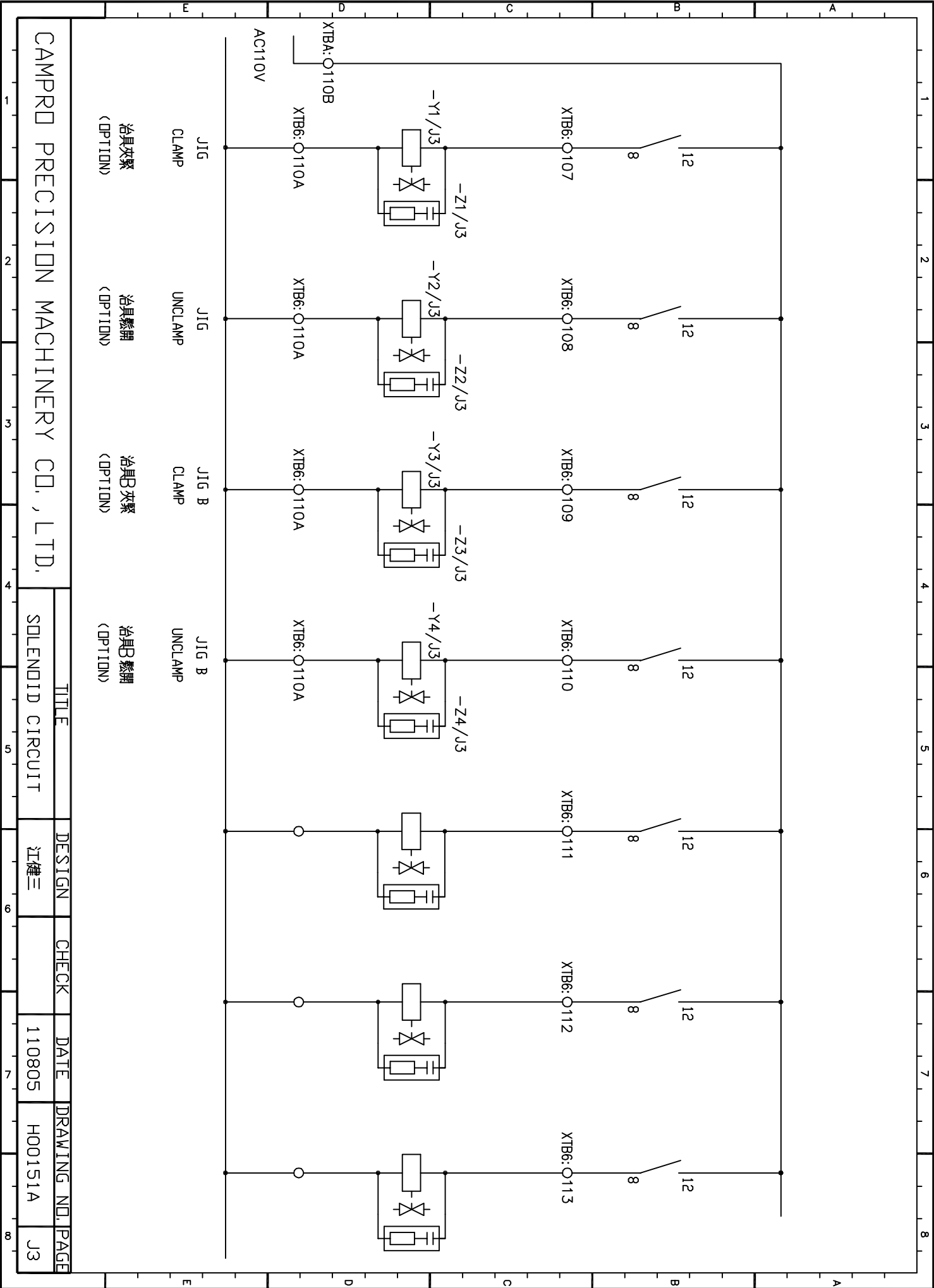


PLB6204 SLOT#3



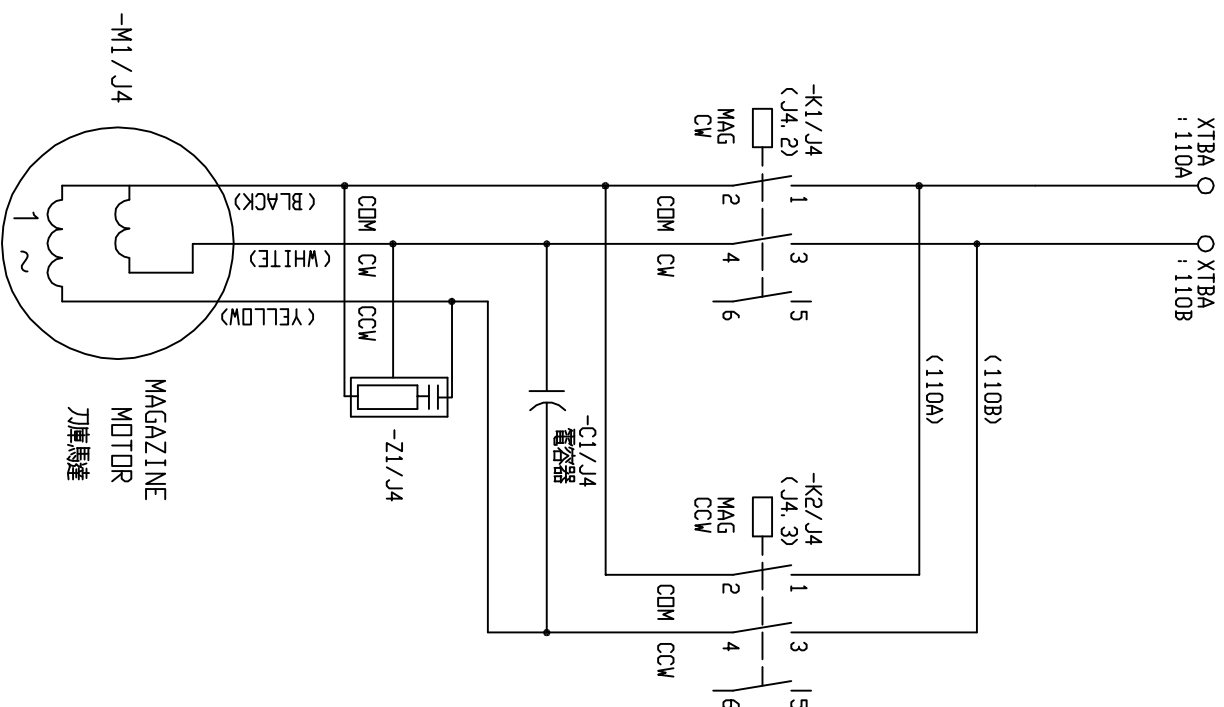
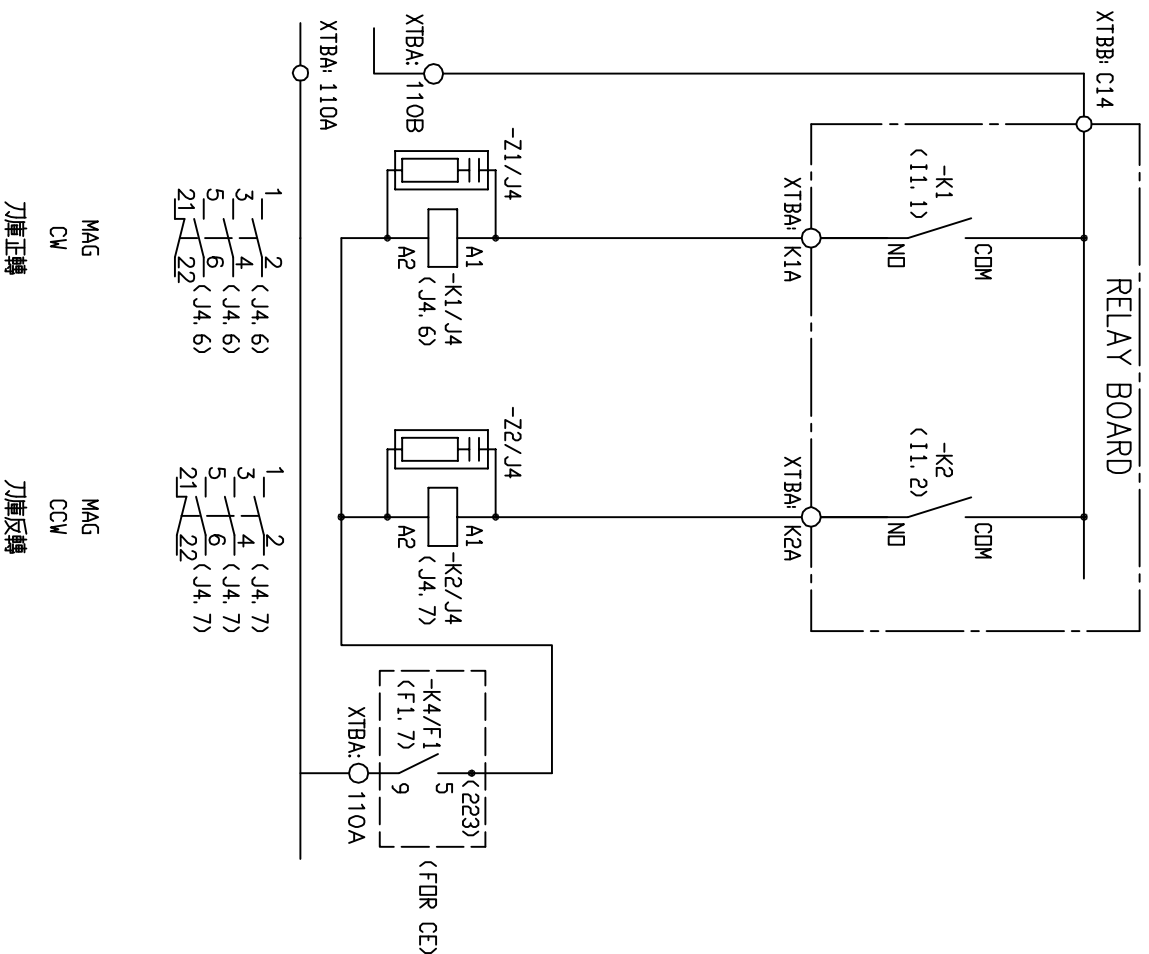
CAMPRD PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
I/O UNIT OUTPUT		江健三		110815	H00146A	14



= MAGAZINE CW/CCW FOR CARROUSEL TYPE =

日内瓦輪式刀庫正/反轉



CAMPRO PRECISION MACHINERY CO., LTD.

TITLE
SYSTEM CIRCUIT

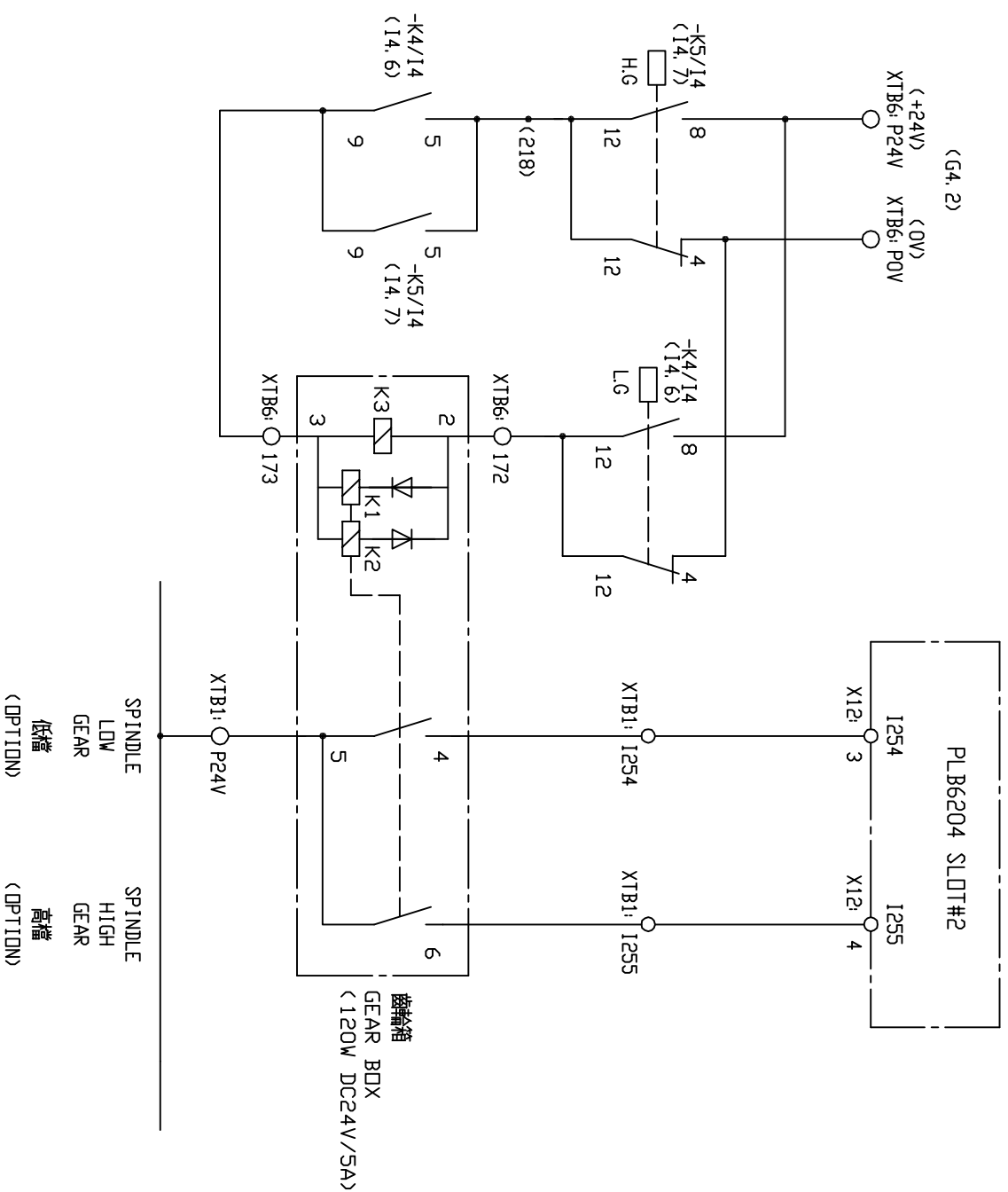
DESIGN
江健三

CHECK

DATE
110809

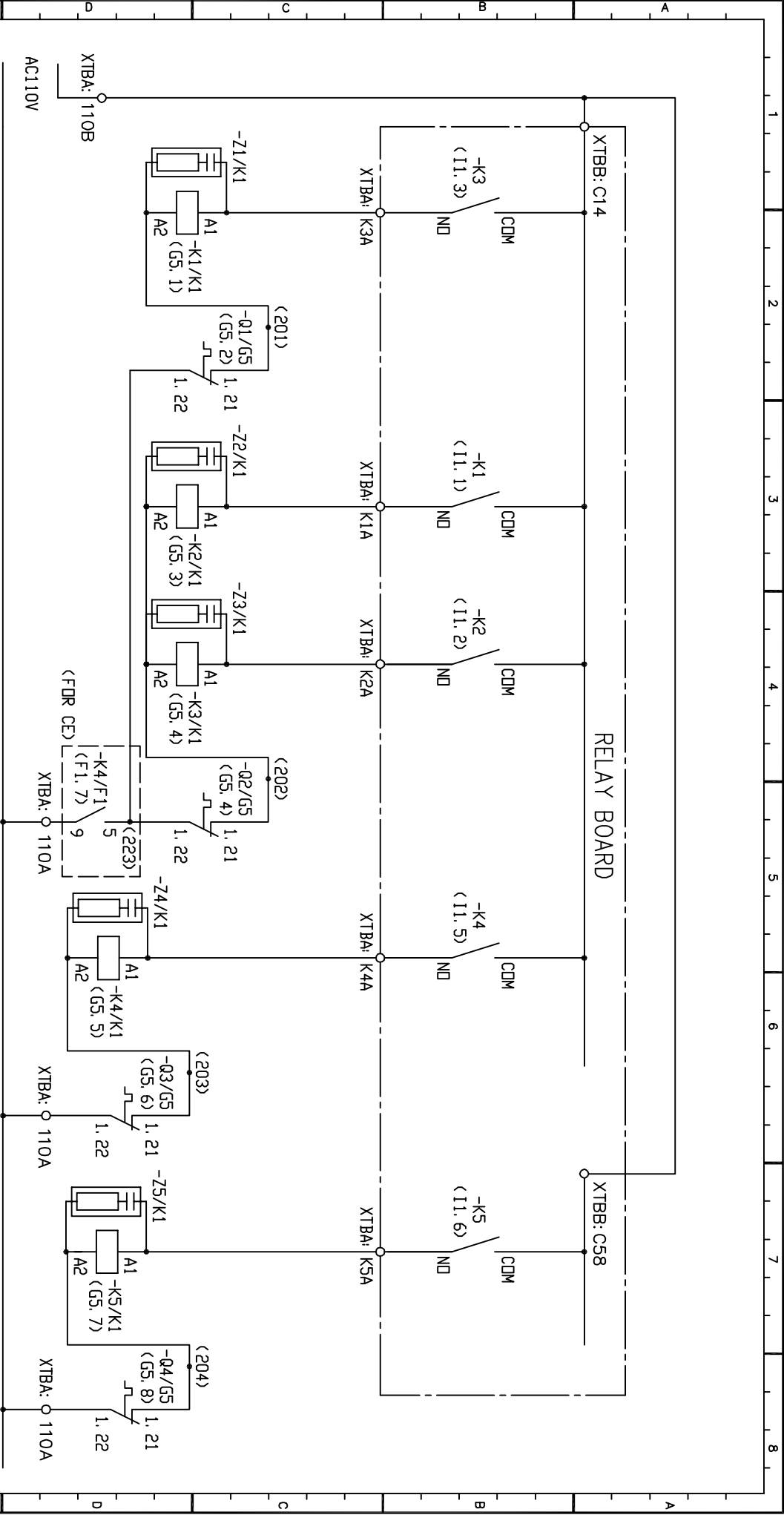
DRAWING NO. PAGE
H00152A J4

齊富兩段變速齒輪箱 ZF TWO-SPEED GEAR BOX(OPTION)



CAMPRO PRECISION MACHINERY CO., LTD.

TITLE	DESIGN	CHECK	DATE	DRAWING NO.	PAGE
SOLENOID CIRCUIT	江健三		110815	H00153A	J5



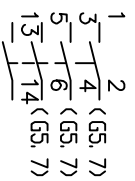
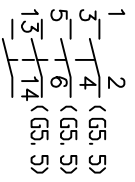
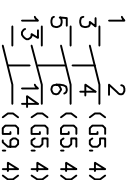
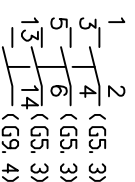
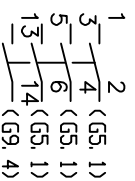
ARM
MOTOR
換刀臂馬達
(ARM TYPE)

MAG
C. W
刀庫正轉
(ARM TYPE)

MAG
C. C. W
刀庫反轉
(ARM TYPE)

COOLANT
MOTOR
切削液馬達

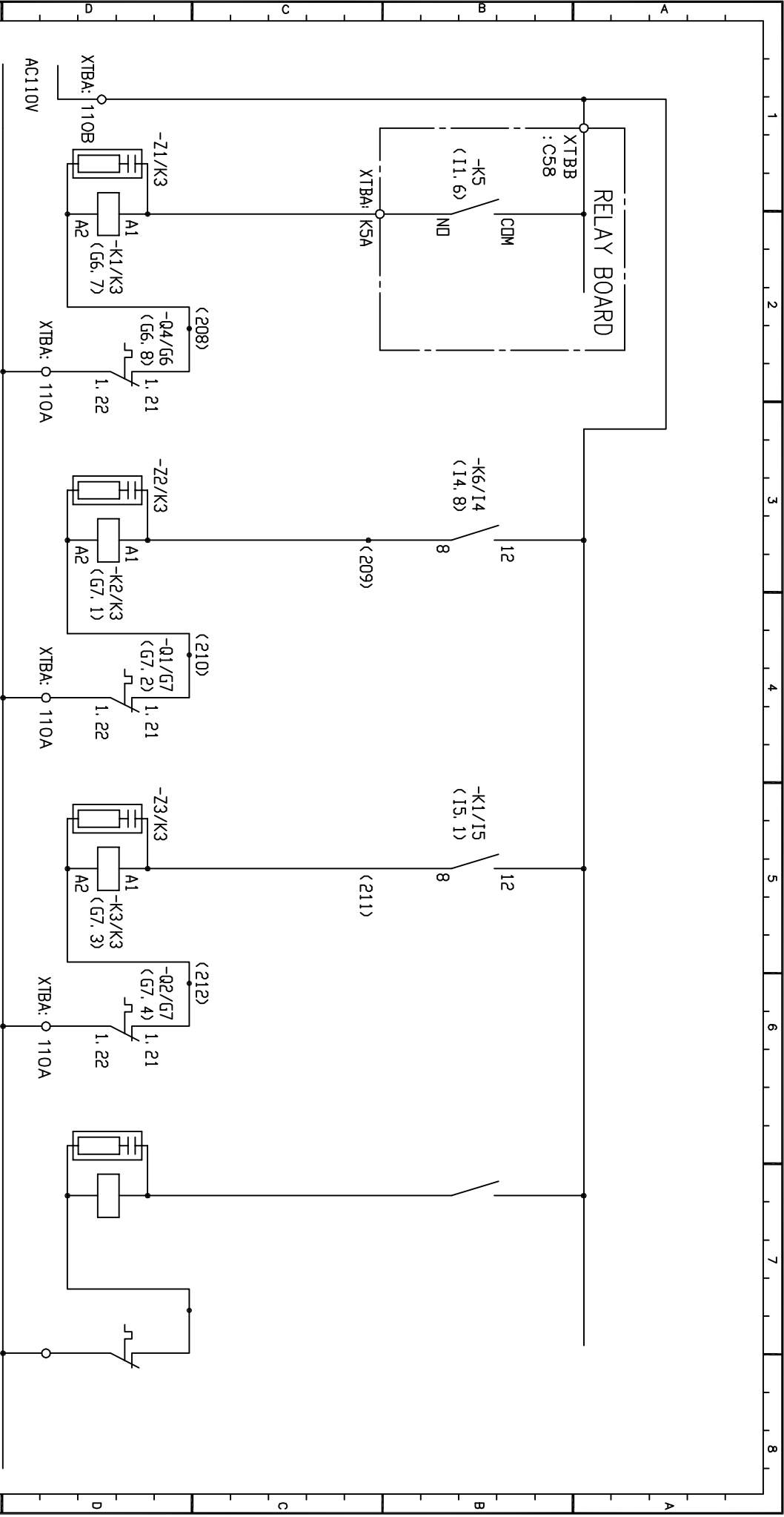
DIL
COOLER
主軸油冷機



CAMPRO PRECISION MACHINERY CO., LTD.

TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
MCC CIRCUIT		江健三		110809	H00154A	K 1



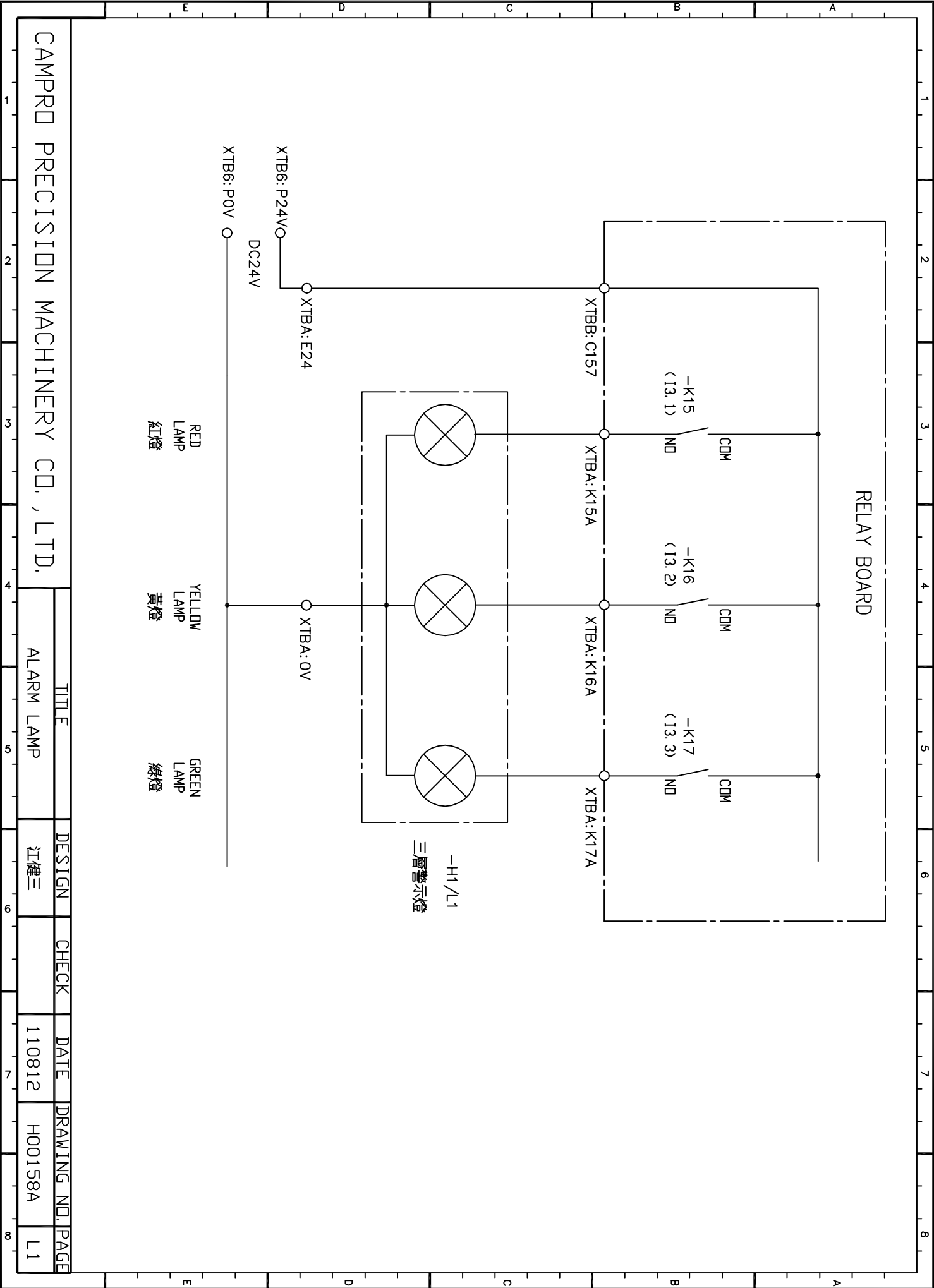


HYDRAULIC
MOTOR
油壓馬達
(OPTION)

CTS
MOTOR
主軸中心出水馬達
(CTS)

PUMP
MOTOR
抽水馬達
(CTS)

CAMPRD PRECISION MACHINERY CO., LTD.		TITLE		DESIGN	CHECK	DATE	DRAWING NO.	PAGE
		MCC CIRCUIT		江健三		110815	H00156A	K3



Connector : XM60 Location : [Eelectrical cabinet — Coolant motor]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U3	-M3/G5	COOLANT MOTOR	G5	
2	V3	-M3/G5	COOLANT MOTOR	G5	
3	W3	-M3/G5	COOLANT MOTOR	G5	
4	G		GROUND	G5	
Connector : XM61 Location : [Eelectrical cabinet — Oil cooler]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U4	-M4/G5	OIL COOLER	G5	
2	V4	-M4/G5	OIL COOLER	G5	
3	W4	-M4/G5	OIL COOLER	G5	
4	G		GROUND	G5	
5	I236	-F1/H3	SPINDLE OIL COOLER O.K	H3	
6	P24V		DC 24V	H3	
7					
Connector : XM62 Location : [Eelectrical cabinet — Chassis rinse]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U5	-M1/G6	CHASSIS RINSE	G6	
2	V5	-M1/G6	CHASSIS RINSE	G6	
3	W5	-M1/G6	CHASSIS RINSE	G6	
4	G		GROUND	G6	
Connector : XM63 Location : [Eelectrical cabinet — Chip conveyor]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U6	-M2/G6	CHIP CONVEYOR	G6	
2	V6	-M2/G6	CHIP CONVEYOR	G6	
3	W6	-M2/G6	CHIP CONVEYOR	G6	
4	G		GROUND	G6	
5	I271	-S1/H5	CHIP CONVEYOR STOP BUTTON	H5	
6	P24V		DC 24V	H5	
7					
Connector : XM64 Location : [Eelectrical cabinet — Chip screw]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U7	-M3/G6	CHIP SCREW	G6	
2	V7	-M3/G6	CHIP SCREW	G6	
3	W7	-M3/G6	CHIP SCREW	G6	
4	G		GROUND	G6	
Connector : XM65 (for 4th axis) Location : [Eelectrical cabinet — Hydraulic motor]					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U8	-M4/G6	HYDRAULIC MOTOR	G6	
2	V8	-M4/G6	HYDRAULIC MOTOR	G6	
3	W8	-M4/G6	HYDRAULIC MOTOR	G6	
4	G		GROUND	G6	
5	101	-Y6/J1	4 AXIS CLAMP	J1	
6	102	-Y7/J1	4 AXIS UNCLAMP	J1	
7	110A				

Connector : XM70				Location : [Eelectrical cabinet — CTS motor]	
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U9	-M1/G7	CTS MOTOR	G7	
2	V9	-M1/G7	CTS MOTOR	G7	
3	W9	-M1/G7	CTS MOTOR	G7	
4	G		GROUND	G7	
Connector : XM71				Location : [Eelectrical cabinet — Pump motor]	
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U10	-M2/G7	PUMP MOTOR	G7	
2	V10	-M2/G7	PUMP MOTOR	G7	
3	W10	-M2/G7	PUMP MOTOR	G7	
4	G		GROUND	G7	
Connector : XM72				Location : [Eelectrical cabinet — Pump motor]	
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	I260	-F3/H5	SUB TANK LOW	H5	
2	I261	-F4/H5	SUB TANK HIGH	H5	
3	I270	-F5/H5	FILTER PRESSURE S.W	H5	
4	P24V		DC 24V	H5	
Connector : XM80				Location : [Eelectrical cabinet — Chip screw 2]	
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U13	-M1/G8	CHIP SCREW 2	G8	
2	V13	-M1/G8	CHIP SCREW 2	G8	
3	W13	-M1/G8	CHIP SCREW 2	G8	
4	G		GROUND	G8	
Connector : XM81				Location : [Eelectrical cabinet — Chip screw 3]	
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	U14	-M2/G8	CHIP SCREW 3	G8	
2	V14	-M2/G8	CHIP SCREW 3	G8	
3	W14	-M2/G8	CHIP SCREW 3	G8	
4	G		GROUND	G8	

Terminal : XTB1/G1			Location : Electrical cabinet		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	L1		POWER SOURCE(LINE IN)	G1	
2	L2		POWER SOURCE(LINE IN)	G1	
3	L3		POWER SOURCE(LINE IN)	G1	
4	PE		POWER EARTH GROUNDING	G1	
5	L12	-T1/G1	TRANSFORMER(INPUT)	G1	OPT
6	L22	-T1/G1	TRANSFORMER(INPUT)	G1	OPT
7	L32	-T1/G1	TRANSFORMER(INPUT)	G1	OPT
8	PE		POWER EARTH GROUNDING	G1	
9	L13		UE/UV POWER	G1	
10	L13		PERIPHERAL POWER	G1	
11	L23		UE/UV POWER	G1	
12	L23		PERIPHERAL POWER	G1	
13	L33		UE/UV POWER	G1	
14	L33		PERIPHERAL POWER	G1	

Terminal : XTB1、XTB6			Location : Electrical cabinet(For C.E)		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
1	110T		TR. AC110V (T)	G1	
2	110A		TR. AC110V (A)	G1	
3	110B		TR. AC110V (B)	G1	
4	220T		TR. AC220V (T)	G1	
5	220A		TR. AC220V (A)	G1	
6	220A		TR. AC220V (A)	G1	
7	220A		TR. AC220V (A)	G1	
8	220B		TR. AC220V (B)	G1	
9	220B		TR. AC220V (B)	G1	
10	220B		TR. AC220V (B)	G1	
11	3-1	-K2,K3/K1	MAG MOTOR CW/CCW MC	G9	
12	3-2	-M2/G5	MAG MOTOR BRAKE	G9	
13	3-3	-K1/K1	ARM MOTOR MC	G9	
14	3-4	-M1/G5	ARM MOTOR BRAKE	G9	
15	P24V		+24V.PLC	G4	
16	P24V		+24V.PLC	G4	
17	P24V		+24V.PLC	G4	
18	P24V		+24V.PLC	G4	
19	I222	-S1/H1	MANUAL TOOL UNCLAMP	H1	
20	I223	-S2/H1	TOOL CLAMP	H1	
21	I224	-S3/H1	TOOL UNCLAMP	H1	
22	I225	-S4/H1	POT UP /MAG LEFT	H1	
23	I226	-S5/H1	POT DOWN /MAG RIGHT	H1	
24	I227	-B1/H1	MAG COUNTER	H1	
25	I228	-B2/H1	MAG IN-POSITION	H1	
26	I229	-B1/H2	ARM STOP POINT	H2	
27	I230	-B2/H2	ARM CLIP /UNCLAMP POINT	H2	
28	I231	-B3/H2	ARM ORIGIN /CHECK POINT	H2	
29	I232	-B4/H2	ARM CLAMP POINT	H2	
30	I233	-F1/H2	AIR PRESSURE O.K	H2	
31	I234	-F2/H2	LUBE LEVEL O.K	H2	
32	I235	-F3/H2	LUBE PRESSURE	H2	
33	I236	-F1/H3	OIL COOLER O.K	H3	
34	I237		MOTOR OVERLOAD	H3	
35	I246		BRAKING RESISTOR ALARM	H3,C2	
36	I247		AXIS OVERTRAVEL	H3,F1	
37	I248		EMG_BUTTON UNLOCKED	H3,F1	
38	I249		DRIVE ENABLE GROUP 1	H3,F2	
39	I250		GUARD CLOSED	H3,F2	
40	I251		GUARD LOCKED	H4,F2	
41	I252	-S1/F2	MAINTENANCE KEY	H4,F2	
42	I253	-S2/F2	CONFIRMATION BUTTON	H4,F2	
43	I254	-S1/H4	LOW GEAR /LOW SPEED	H4	
44	I255	-S2/H4	HIGH GEAR /HIGH SPEED	H4	
45	I256	-S3/H4	4 AXIS CLAMP	H4	
46	I257	-S4/H4	4 AXIS UNCLAMP	H4	
47	I258	-F1/H5	MAIN TANK LOW(CTS)	H5	
48	I259	-F2/H5	MAIN TANK FULL(CTS)	H5	
49	I260	-F3/H5	SUB TANK LOW(CTS)	H5	
50	I261	-F4/H5	SUB TANK FULL(CTS)	H5	

Terminal : XTB1、XTB6			Location : Electrical cabinet(For C.E)		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
51	I270	-F5/H5	FILTER PRESSURE S.W(CTS)	H5	
52	I271	-S1/H5	CHIP CONVEYOR STOP BUTTON	H5	
53	I272				
59	X9-14b	-B1/H6	SPINDLE REFERENCE POSITION	H6	
60	P0V		0V.PLC	G4	
61	P0V		0V.PLC	G4	
62	P0V		0V.PLC	G4	
63	P0V		0V.PLC	G4	
64	P24V		+24V.PLC	G4	
65	P24V		+24V.PLC	G4	
66	P24V		+24V.PLC	G4	
67	P24V		+24V.PLC	G4	
68	I200	-S1/H7	*DEC X	H7	
69	I201	-S2/H7	*DEC Y	H7	
70	I202	-S3/H7	*DEC Z	H7	
71	I203	-S4/H7	*DEC 4	H7	
72	1	-S1/H3	P24V & *O.T X	F1	
73	2	-S2/H3	*O.T Y	F1	
74	3	-S3/H3	*O.T Z	F1	
75	4	-S4/H3	*O.T 4	F1	
76	5	-S4/H3	*O.T 4	F1	
77	6	-K5/F1	O.T RELAY	F1	
78	121	-S1/F1	EMG-STOP BUTTON (MB620)	F1	
79	122	-S2/F1	EMG-STOP BUTTON (HANDWHEEL)	F1	
80	123	-S3/F1	SIDE DOOR INTERLOCK A	F1	
81	124	-S4/F1	SIDE DOOR INTERLOCK B	F1	
82	125	-K5/F1	O.T RELAY	F1	
83	126	-S1/F1	EMG-STOP BUTTON (MB620)	F1	
84	127	-S2/F1	EMG-STOP BUTTON (HANDWHEEL)	F1	
85	128	-S3/F1	SIDE DOOR INTERLOCK A	F1	
86	129	-S4/F1	SIDE DOOR INTERLOCK B	F1	
87	130	-K5/F1	O.T RELAY	F1	
88	141	-K1/J2	GUARD DOOR S.W LOCKED	F2	
89	142	-K1/J2	GUARD DOOR S.W LOCKED	F2	
90	143	-K2/F1	EMG RELAY 1	F2	
91	144	-K1/J2	GUARD DOOR S.W CLOSED	F2	
92	145	-K3/F1	EMG RELAY 2	F2	
93	N24V		+24V.NC	G4	
94	N0V		0V.NC	G4	
95	161	-S1/G1	ELECTRIC CABINET S.W	G4	
96	162	-S2/G1	ELECTRIC CABINET S.W	G4	
97	163	-H2/G3	WORK LIGHT 2	G3	OPT
98	164	-M1/G3	OIL SKIMMER	G3	OPT

Terminal : XTB1、XTB6

Location : Electrical cabinet(For C.E)

Pin Number	Designation	Device	Comment	Ref. Page	P.S
99	110A		TR. AC110V (A)	G1	OPT
100	101	-Y6/J1	4 AXIS CLAMP	J1	OPT
101	102	-Y7/J1	4 AXIS UNCLAMP	J1	OPT
102	103	-Y3/J2	COOLANT A	J2	OPT
103	104	-Y4/J2	KIT	J2	OPT
104	105	-Y5/J2	RINGED SPRAY	J2	OPT
105	106			J2	OPT
	171	-H3/G3	ELECTRICAL CABINET LAMP	G3	OPT
	172		ZF GEAR BOX	J5	OPT
	173		ZF GEAR BOX	J5	OPT
	174	-F2/H3	EXTERNAL OIL TANK(FOR ZF)	H3	OPT

Connector : X50 (for arm type)

Location : [Electrical cabinet — External box(on the ATC)]

Pin Number	Designation	Device	Comment	Ref. Page	P.S
24V	N24		DC 24V		
24V			DC 24V		
24V			DC 24V		
0V	0V		DC 0V		
0V			DC 0V		
1	I225	-S4/H1	POT UP	H1	
2	I226	-S5/H1	POT DOWN	H1	
3	I228	-B1/H4	MAG IN-POSITION	H4	
4	I229	-B1/H2	ARM STOP POINT	H2	
6	I231	-B3/H2	ARM ORIGIN /CHECK POINT	H2	
7					
8	I227	-B1/H1	MAG COUNTER	H1	
11	I230	-B2/H2	ARM CLIP /UNCLAMP POINT	H2	
12	I232	-B4/H2	ARM CLAMP POINT	H2	
W2	W1	-M1/G5	ARM MOTOR	G5	
V2	V1	-M1/G5	ARM MOTOR	G5	
U2	U1	-M1/G5	ARM MOTOR	G5	
E	G		GROUND	G5	
W1	W2	-M2/G5	MAGAZINE MOTOR	G5	
V1	V2	-M2/G5	MAGAZINE MOTOR	G5	
U1	U2	-M2/G5	MAGAZINE MOTOR	G5	

No Terminal(For C.E)					
Pin Number	Designation	Device	Comment	Ref. Page	P.S
	201	-K1/K1	ARM MOTOR MCC	K1	
	202	-K2/K1,-K3/K1	MAG CW/CCW MCC	K1	
	203	-K4/K1	COOLANT MOTOR MCC	K1	
	204	-K5/K1	OIL COOLER MCC	K1	
	205	-K1/K2	CHASSIS RINSE MCC	K2	
	206	-K2/K2,-K3/K2	CHIP CONVEYOR FORWARD/BACK MCC	K2	OPT
	207	-K4/K2,-K5/K2	CHIP SCREW CW/CCW MCC	K2	OPT
	208	-K1/K3	HYDRAULIC MOTOR MCC	K3	OPT
	209	-K2/K3	CTS MOTOR MCC	K3	OPT
	210	-K2/K3	CTS MOTOR MCC	K3	OPT
	211	-K3/K3	PUMP MOTOR MCC	K3	OPT
	212	-K3/K3	PUMP MOTOR MCC	K3	OPT
	213				
	214				
	216	-K2/K4,-K3/K4	CHIP SCREW 2 CW/CCW MCC	K4	
	217	-K4/K4,-K5/K4	CHIP SCREW 3 CW/CCW MCC	K4	
	218	-K3/I4	ZF GEAR BOX	J5	
	219	-K4/I4	SPINDLE HIGH/LOW SPEED CONTROL	C3	
	220	-K1/C3	SPINDLE HIGH/LOW SPEED CONTROL	C3	
	221	-K5/I4	SPINDLE HIGH/LOW SPEED CONTROL	C3	
	222	-K2/C3	SPINDLE HIGH/LOW SPEED CONTROL	C3	
	223		ARM/MAG/CHIP MOTOR BREAKER	4.K1,K2,K4	
	224	-K2/I5	RINGED SPRAY RELAY	I5	OPT
	225	-K3/I5	WORK LIGHT 2 RELAY	I5	OPT
	226		Z AXIS BRAKE CIRCUIT	G4	
	251		EMERGENCY STOP SAFETY CIRCUIT	F1	
	252		EMERGENCY STOP SAFETY CIRCUIT	F1	
	253		EMERGENCY STOP SAFETY CIRCUIT	F1	
	254		EMERGENCY STOP SAFETY CIRCUIT	F1	
	255		EMERGENCY STOP SAFETY CIRCUIT	F1	
	256		EMERGENCY STOP SAFETY CIRCUIT	F1	
	257		EMERGENCY STOP SAFETY CIRCUIT	F1	
	258		EMERGENCY STOP SAFETY CIRCUIT	F1	
	259		EMERGENCY STOP SAFETY CIRCUIT	F1	
	260		EMERGENCY STOP SAFETY CIRCUIT	F1	
	261		EMERGENCY STOP SAFETY CIRCUIT	F1	
	262		EMERGENCY STOP SAFETY CIRCUIT	F1	
	263	-K1/F1	CONTROL READY RELAY	F1	
	271		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	272		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	273		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	274		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	275		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	276		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	277		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	278		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	279		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	280		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	281		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	282		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	283		DOOR INTERLOCK SAFETY CIRCUIT	F2	
	284		DOOR INTERLOCK SAFETY CIRCUIT	F2	

	285	-K4/F2	GUARD DOOR RELAY	F2	
	286		UE/UV X70/X71/X72	F2	
	287		UE/UV X70/X71/X72	F2	
	288		UE/UV X70/X71/X72	F2	
	289		UE/UV X70/X71/X72	F2	
	290		UE/UV X70/X71/X72	F2	
	291		UE/UV X70/X71/X72	F2	

Connector : YA			Location : Electrical Cabinet - Relay Board		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
A1	O7	X21:1_#1	MAG C.W	I1	K1
B1	O8	X21:2_#1	MAG C.C.W	I1	K2
A2	O9	X21:3_#1	ARM MOTOR	I1	K3
B2	O10	X21:4_#1	COOLANT MOTOR	I1	K4
A3	O11	X21:5_#1	OIL COOLER /HYDRAULIC /LABYRINTH BLOW	I1	K5
B3	O12	X21:6_#1	CHASSIS RINSE	I1	K6
A4	O13	X21:7_#1	CHIP CONVEYOR FORWARD /CHIP SCREW CW	I1	K7
B4	O14	X21:8_#1	CHIP CONVEYOR BACK /CHIP SCREW CCW	I2	K8
A5	O15	X21:1_#2		I2	K9
B5	O16	X21:2_#2	TOOL UNCLAMP	I2	K10
A6	O17	X21:3_#2	UNCLAMP BLOW	I2	K11
B6	O18	X21:4_#2	WORKPIECE BLOW /A.T.L.M BLOW	I2	K12
A7	O19	X21:5_#2	POT UP/MAG LEFT	I2	K13
B7	O20	X21:6_#2	POT DOWN /MAG RIGHT	I2	K14
A8	O21	X21:7_#2	RED LAMP	I3	K15
B8	O22	X21:8_#2	YELLOW LAMP	I3	K16
A9	O23	X21:1_#3	GREEN LAMP	I3	K17
B9	O24	X21:2_#3	Z AXIS BRAKE	I3	K18
A10	O25	X21:3_#3	GUARD UNLOCK	I3	K19
B10	O26	X21:4_#3	LUBE MOTOR	I3	K20
A11	O27	X21:5_#3	AUTO POWER OFF	I3	K21
B11	O28	X21:6_#3	WORK LIGHT	I4	K22
A12					
B12					
A13					
B13					
A14	0V	XTB6:P0V	0V.PLC	I1	
B14	0V	XTB6:P0V	0V.PLC	I1	
A15	E24				
B15	E24				

Terminal : TBA			Location : Electrical Cabinet - Relay Board		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
K1A	K1A	-K2/K1	MAG C.W	K1	
K2A	K2A	-K3/K1	MAG C.C.W	K1	
K3A	K3A	-K1/K1	ARM MOTOR	K1	
K4A	K4A	-K4/K1	COOLANT MOTOR	K1	
K5A	K5A	-K5/K1	OIL COOLER	K1	
K6A	K6A	-K1/K2	CHASSIS RINSE	K2	
K7A	K7A	-K2/K2,-K4/K2	CHIP CONVEYOR FORWARD /CHIP SCREW CW	K2	
K8A	K8A	-K3/K2,-K5/K2	CHIP CONVEYOR BACK /CHIP SCREW CCW	K2	
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A		
110A	110A		AC110V A	G1	
110B	110B		AC110V B	G1	
110B	110B		AC110V B		
K9A	K9A				
K10A	K10A	-Y1/J1	TOOL UNCLAMP	J1	
K11A	K11A	-Y2/J1	UNCLAMP BLOW	J1	
K12A	K12A	-Y3/J1,-Y2/J2	WORKPIECE BLOW /A.T.L.M BLOW	J1,J2	
K13A	K13A	-Y4/J1	POT UP /MAG LEFT	J1	
K14A	K14A	-Y5/J1	POT DOWN /MAG RIGHT	J1	
K15A	K15A	-H1/L1	RED LAMP	L1	
K16A	K16A	-H1/L1	YELLOW LAMP	L1	
K17A	K17A	-H1/L1	GREEN LAMP	L1	
0V	0V		DC0V		
0V	0V		DC0V		
0V	0V		DC0V	L1	
E24	E24		NC24V	L1	
E24	E24		NC24V		
K18A	K18A		Z AXIS BRAKE	G4	
K18C	K18C		Z AXIS BRAKE	G4	
K19A	K19A	-K1/J2	GUARD UNLOCK	J2	
K20A	K20A	-M1/G2	LUBE MOTOR	G2	
K21A	K21A	-K1/G2	AUTO POWER OFF	G2	
K22A	K22A	-H1,H2/G3	WORK LIGHT	G3	
24A	24A		AC24V A		
24A	24A		AC24V A		
24A	24A		AC24V A		
24B	24B		AC24V B		
220A	220A		AC220V A		
220A	220A		AC220V A		
220A	220A		AC220V A	G1	
220B	220B		AC220V B	G1	

Terminal : TBB			Location : Electrical Cabinet - Relay Board		
Pin Number	Designation	Device	Comment	Ref. Page	P.S
C14	C14		K1~K4 COMMON	K1	
C58	C58		K5~K8 COMMON	K1,K2	
C910	C910		K9~K10 COMMON	J1	
C112	C112		K11~K12 COMMON	J1,J2	
C134	C134		K13~K14 COMMON	J1	
C157	C157		K15~K17 COMMON	L1	
C19	C19		K19 COMMON	J2	
C20	C20		K20 COMMON	G2	
C21	C21		K21 COMMON	G2	
C22	C22		K22 COMMON	G3	

MOTOR ENCODER CABLE :


		4 Axis inside		External		Cabinet inside	
		Motor	4 Axis	4 Axis	Shroud	Shroud	CC6106
Assignment	Color	Female	Male	Female	Male	Female	Male
A+	Green/Black	1	A	A	A	A	3
A-	Yellow/Black	2	B	B	B	B	4
B+	Blue/Black	11	C	C	C	C	6
B-	Red/Black	12	D	D	D	D	7
	Inter Shield	17	G	G	G	G	8
R+	Red	3	E	E	E	E	17
R-	Black	13	F	F	F	F	18
C+	Green	5	H	H	H	H	19
C-	Brown	6	J	J	J	J	20
D+	Gray	14	K	K	K	K	21
D-	Pink	4	L	L	L	L	22
TEMP+	Yellow	8	M	M	M	M	13
TEMP-	Violet	9	N	N	N	N	25
5V	Brown/Green	10	P	P	P	P	1
0V	White/Green	7	S	S	S	S	2
5V Sensor	Blue	16	R	R	R	R	14
0V Sensor	White	15	T	T	T	T	16
	External Shield	Shell	V	V	V	V	Shell

POWER CABLE :

		4 Axis inside		External		Cabinet inside	
		Motor	4 Axis	4 Axis	Shroud	Shroud	
Comment	Color	Female	Male	Female	Male	Female	Terminal
U		1	J	J	J	J	X81:U
V		2	K	K	K	K	X81:V
W		6	L	L	L	L	X81:W
Ground			M	M	M	M	G
Common			A	A	A	A	N24V
Clamp L.S			B	B	B	B	I256
Unclamp L.S			C	C	C	C	I257
Zero-return			R	R	R	R	I203
Zero-return			S	S	S	S	N24V
Valve			P	P	P	P	101(102)
Valve			N	N	N	N	110A

	CC6106 (X15~X20)		Speed Encoder	
Assignment	Female	Color	Female	
+5 V (Up)	1	Brown/Green	10	
0 V (U _N)	2	White/Green	7	
A+	3	Green/Black	1	
A-	4	Yellow/Black	2	
0 V				
B+	6	Blue/Black	11	
B-	7	Red/Black	12	
0 V	8	Internal shield	17	
Do not assign				
Do not assign				
Do not assign				
Do not assign				
Temperature+	13	Yellow	8	
+5 V (sensor)	14	Blue	16	
Do not assign				
0 V (sensor)	16	White	15	
R+	17	Red	3	
R-	18	Black	13	
C+	19	Green	5	
C-	20	Brown	6	
D+	21	Gray	14	
D-	22	Pink	4	
Do not assign				
0 V				
Temperature-	25	Violet	9	
Housing	Hsg.	External shield	Hsg.	

	CC6106 (X201~X206)		Position Encoder	
Assignment	Female	Color	Female	
+5 V (Up)	1		12	
0 V (U _N)	2		10	
A+	3		5	
A-	4		6	
Do not assign	5			
B+	6		8	
B-	7		1	
Do not assign	8			
+5 V (sensor)	9		2	
R+	10		3	
0 V (sensor)	11		11	
R-	12		4	
0V	13			
Do not assign	14		7	
Do not assign	15			
External shield	Hsg.	External shield	Hsg.	

Assignment		Motor		Inverter (3-pin)	
		Female	Color	Terminal	
U		1		U	
V		2		V	
		G			
+24 V (brake)		4			
0 V (brake)		5			
W		6		W	

MB620 (X23)		(5+7)pin			HR410	
Male	Color	Female	Male	Color	Female	
Housing	Shield	Housing	Housing	Shield	Housing	
2	White	E	E	White	E	
4	Brown	D	D	Brown	D	
6	Yellow	B	B	Yellow	B	
7	Gray	A	A	Gray	A	
8	Green	C	C	Green	C	
		6	6	BK	6	
		7	7	RD/BL	7	
		5	5	Red	5	
		4	4	Blue	4	
		2	2	WH/GN	2	
		3	3	BN/GN	3	
		1	1	GY/PK	1	
	WH/BN	3	Contact 1 + 2			
	WH/YL	2	Contact 2 (left) permissive button			
	WH/GN	1	Contact 1 (right)			
	WH/BL	1	Contact 1			
	WH/RD	2	Contact 1 EMERGENCY STOP			
	YL/BK	3	Contact 2			
	WH/BK	4	Contact 2			

	MC6222 (X26)		INTERFACE BOX	
Assignment	Male	Color	Female	
TX+	1		1	
TX-	2		2	
REC+	3		3	
Do not assign	4		4	
Do not assign	5		5	
REC-	6		6	
Do not assign	7		7	
Do not assign	8		8	
External shield	Housing	External shield		

	MC6222 (X27)		INTERFACE BOX	
Assignment	Male	Color	Female	
Do not assign	1		1	
RXD	2		3	
TXD	3		2	
DTR	4		20	
Signal GND	5		7	
DSR	6		6	
RTS	7		4	
CTS	8		5	
Do not assign	9			
External shield	Hsg.	External shield	Hsg.	

