LNC-R6000 Robot Controller

Hardware Application Manual

2012/10 Ver：V01.00

Leading Numerical Controller

LNC Technology Co., Ltd.

Table of Content

1 Hardware

1.1 Specification

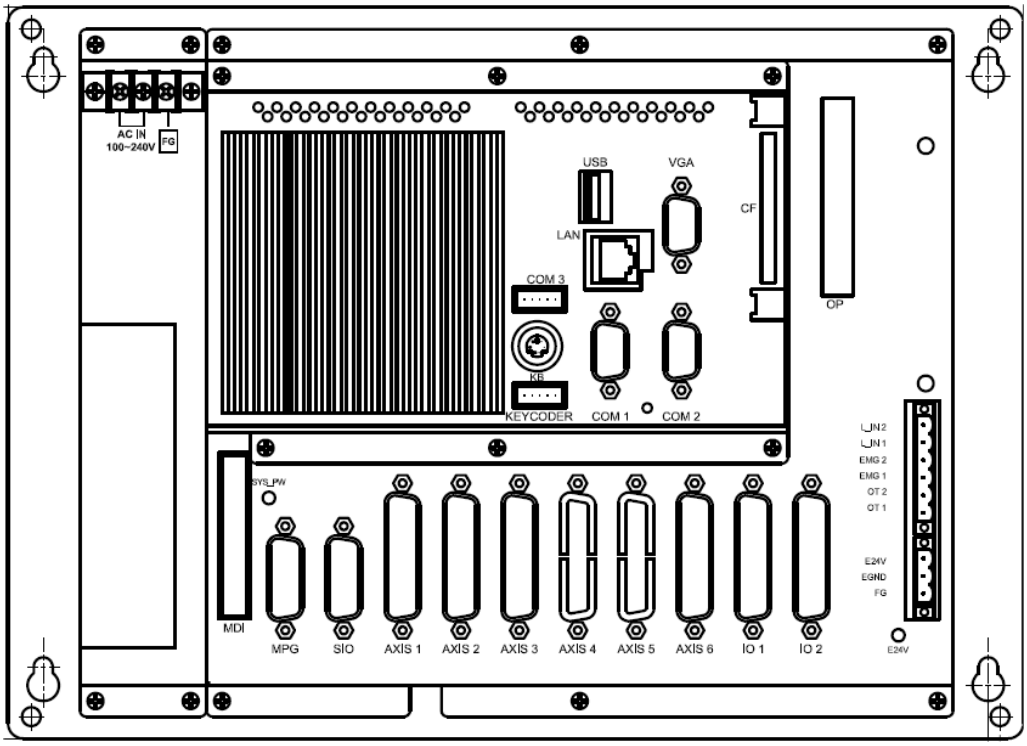
Details are as below：

Item	Specification
Monitor	8" Touch Teach Pedant
SDRAM	256MB
System CF Card	1G
USER I/O	Standard 40IN/32OUT, can be expanded
Control Axes	3 Axes Version：Max.4 axes. 5 Axes Version：Max.6 axes.
Power	AC 110V/240V 50Hz/60Hz input Power

Power Demand

Power type	Specification	Usage	Note
System Power	AC110V/240V 50Hz/60Hz	For system	
External Power(24V）	DC24V/（4A & up）	For external I/O	

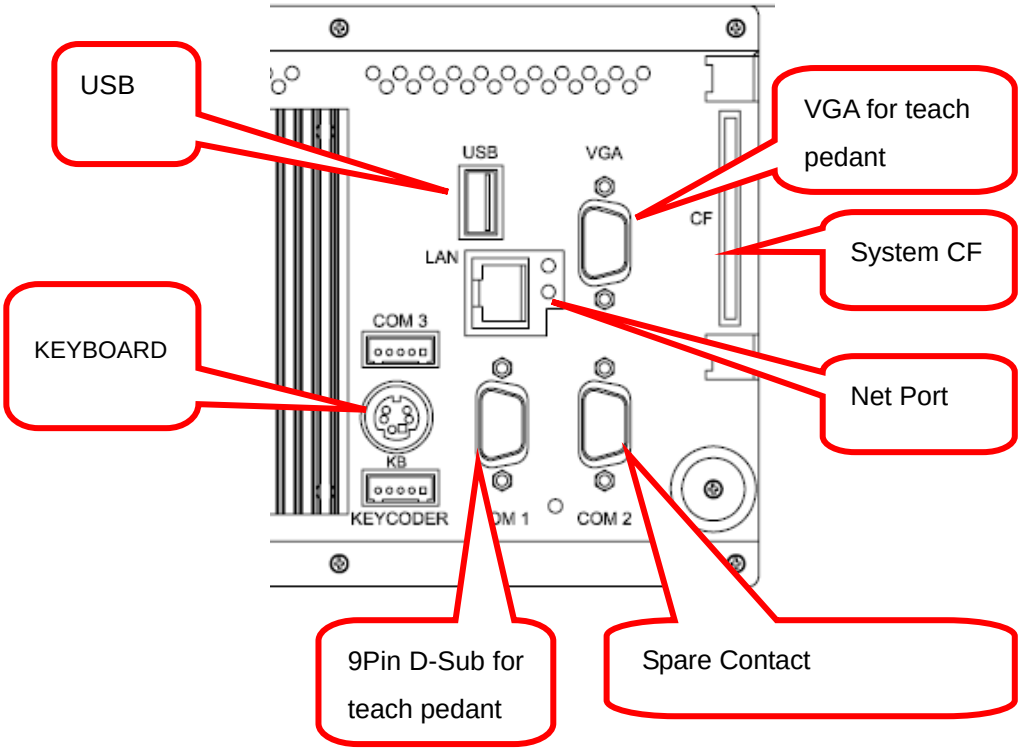
1.2 Product



1.3 System wiring & usage

1.3.1 System wiring

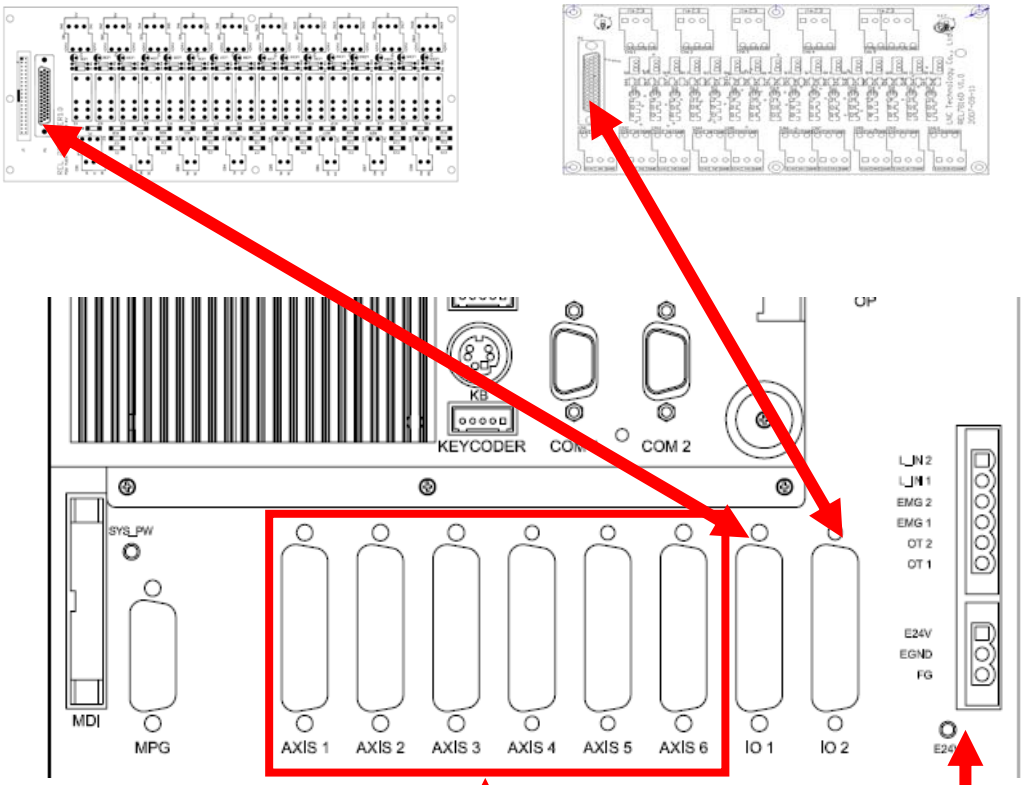
Controller PC interface



Motion control、I/O & Periphery

RELAY2840

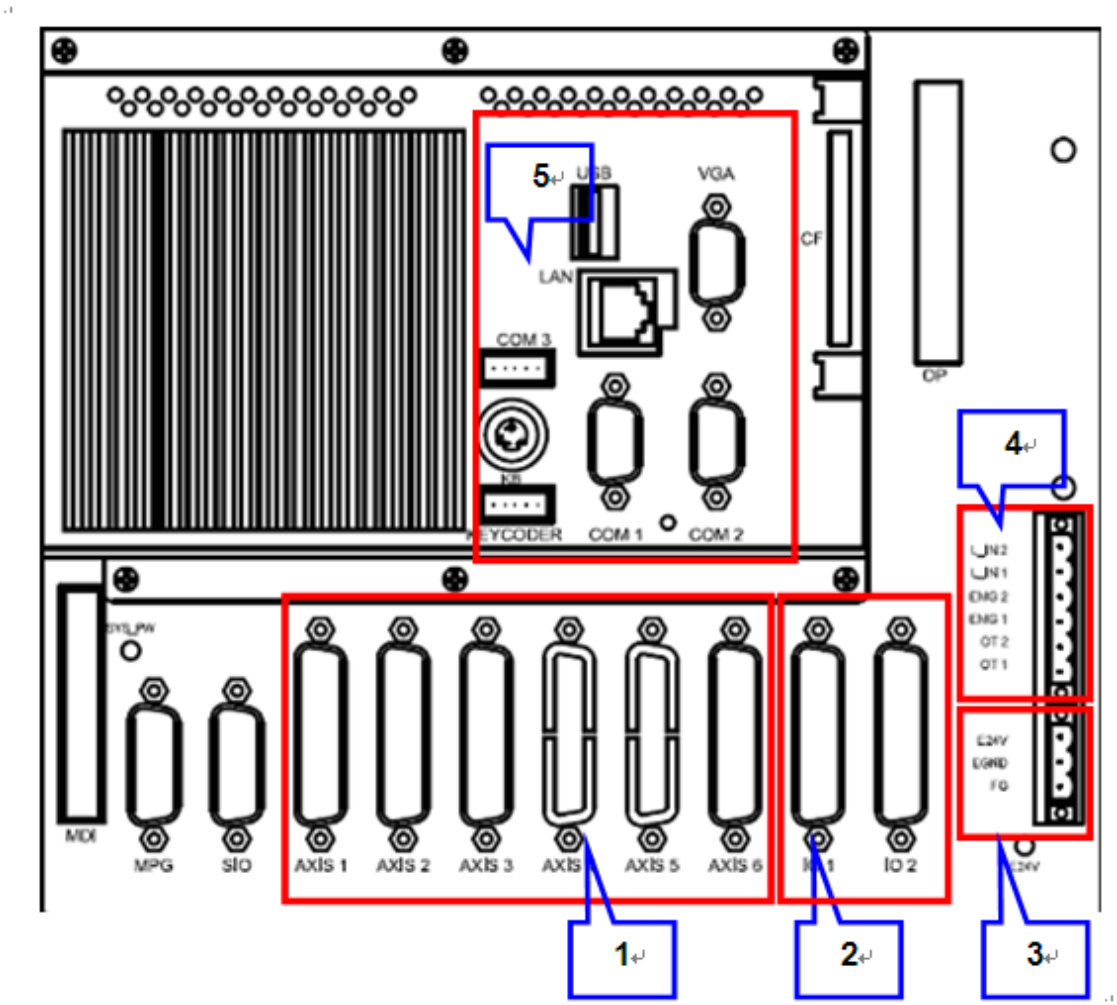
RELAY7816D



Servo Drive

24V power

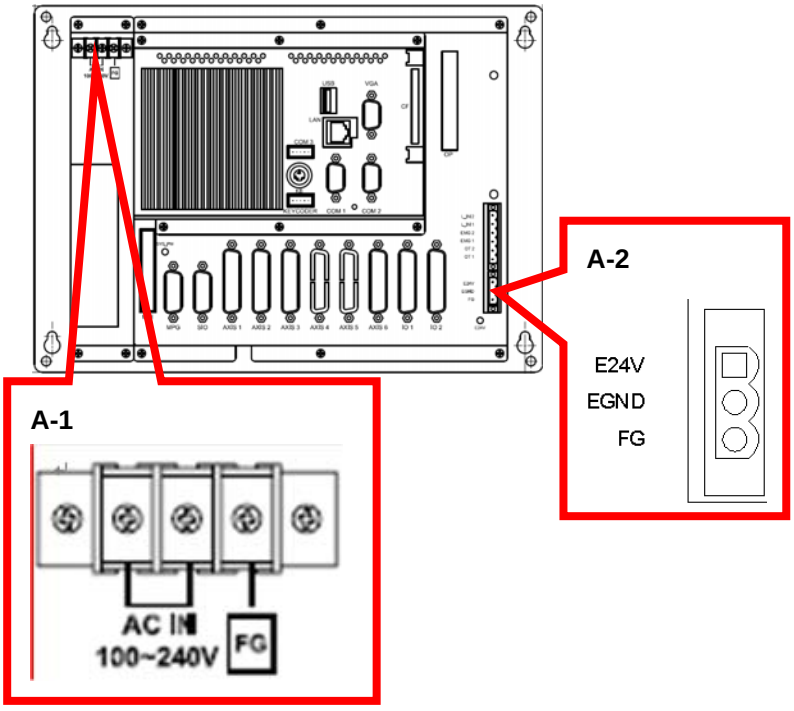
Contact Description



Item	Number	Function	Contact/Component	Note
1	AXIS 1~ 6	Axes Control	D-SUB 25 PIN(Female）	Only for 4、5 axes version
2	USER I/O	20IN/16OUT	HD_D-SUB 44 PIN(Male）	
3	E24V、EGND、FG	External Power 24V Contact	3PIN 5.08mm Terminal	
4	Local_IN/EMG/OT	Quick IN & Protection	6PIN 5.08mm Terminal	
5		PC Peripheral Interface	The same with other contact specification	

1.3.2 System wiring

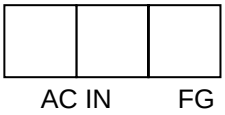
A、Power：



A-1：System Power Supply

◎Details：Offer power for system

◎Terminal details as following：

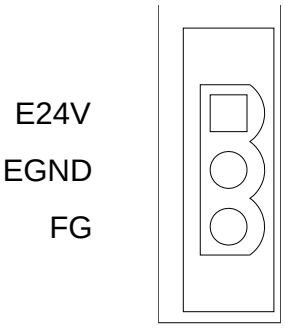


Put AC110V/240V power connect to power supply's AC IN, FG to grounding, please connect with metal chassis (grounding)

A-2：External E24V Contact

◎ Description:E24V is for controller, power control and external I/O to use.

◎ Connector Description: As below：

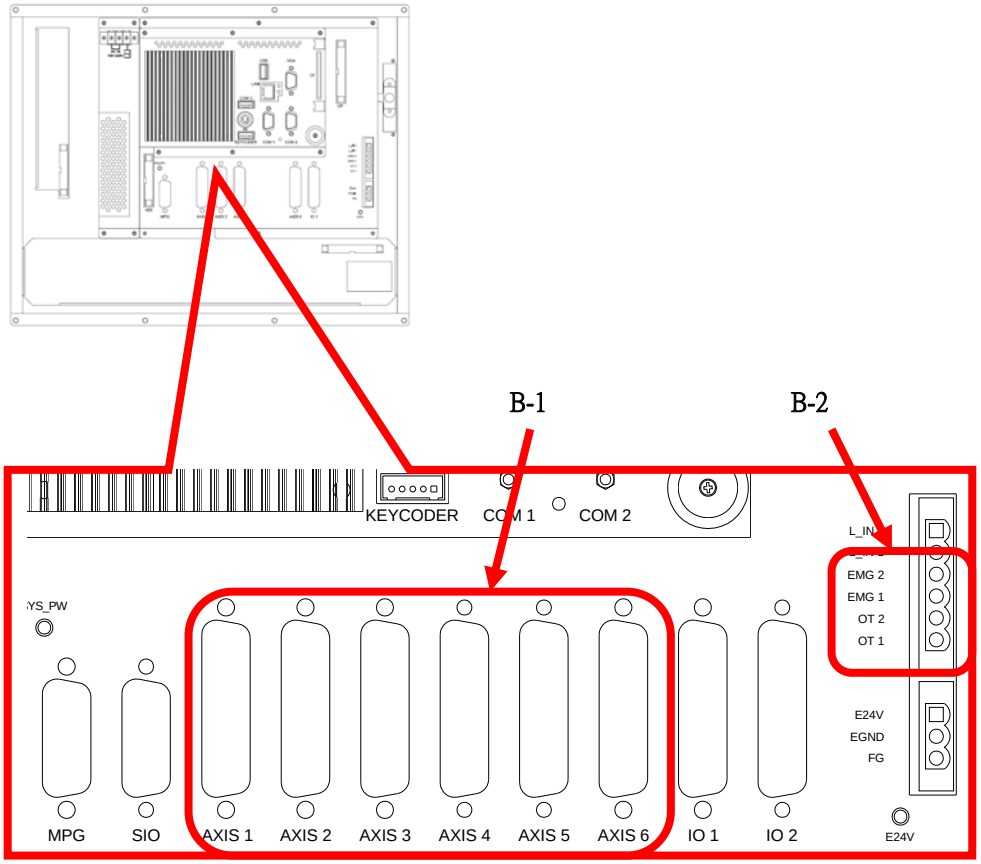


E24V and EGND connect to external power supply AC output side；FG to grounding, please connect with metal chassis (grounding)

◎ Power Demand：(1)E24V/4A above (2) Output voltage ripple and noise is smaller than 150mVp-p.

- **We recommend you to use the power supply of LNC. With using this model, LNC have passed the CE test. We cannot guarantee your needs without using this model.**
- **When using this power supply, please make sure the installation location will not be too far (DC output may have drop voltage.) After booting, E24V power supply voltage will need to stay within E24V±0.5V.**

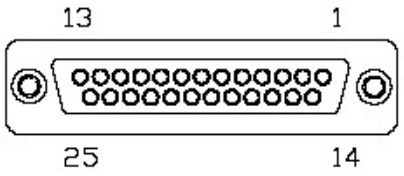
B、Motion Control：



B-1：Servo Control Contact

◎ Details：Offer axes control contact to connect with driver.

◎ ContactDetails：D_SUB 25PIN(Female)contact, definition as below：



PIN	Name	Details	PIN	Name	Details
1	/PB	Pulse Output /B	14	/PA	Pulse Output /A
2	PB	Pulse Output B	15	PA	Pulse Output A
3	E5V	For Encoder (Note1)	16	-	-
4	EGND	E5V/E24VPowerGND	17	DACO	Analog Voltage Output(Note1)
5	AGND	Analog Output GND(Note1)	18	E24V	E24V
6	SRV_ON	Servo ON	19	ALARM	Servo Alarm
7	EGND	E5V/E24VPowerGND	20	EGND	E5V/E24VPower GND
8	EGND	E5V/E24VPowerGND	21	EGND	E5V/E24VPower GND
9	SRV_RST	Servo Reset	22	-	-
10	C	Encoder C	23	/C	Encoder /C
11	A	Encoder A	24	/A	Encoder /A
12	B	Encoder B	25	/B	Encoder /B
13	FG	Chasis GND	-	-	-

◎Note：

(1) Only AXIS 6 has E5V & voltage output(±10V).

(2) Pulse output & encoder are all diferencia signal.

- **When making the connection cables of control pin and back-end driver, please use better shielding cover and cables (A.W.G24 UP) And make sure the connection of shielding cables to reduce the chance of noise interference. LNC offers standard cables for selection.**
- **Please don’t bind signal control cables with power cables at the same time or put at the same cable box.**

B-2：OT & EMG Contact

◎ Wiring：

(1) Make OT1 & OT2 connection.

(2) Connect EMG cable from teach pedant to EMG1 & EMG2.

◎ Details：

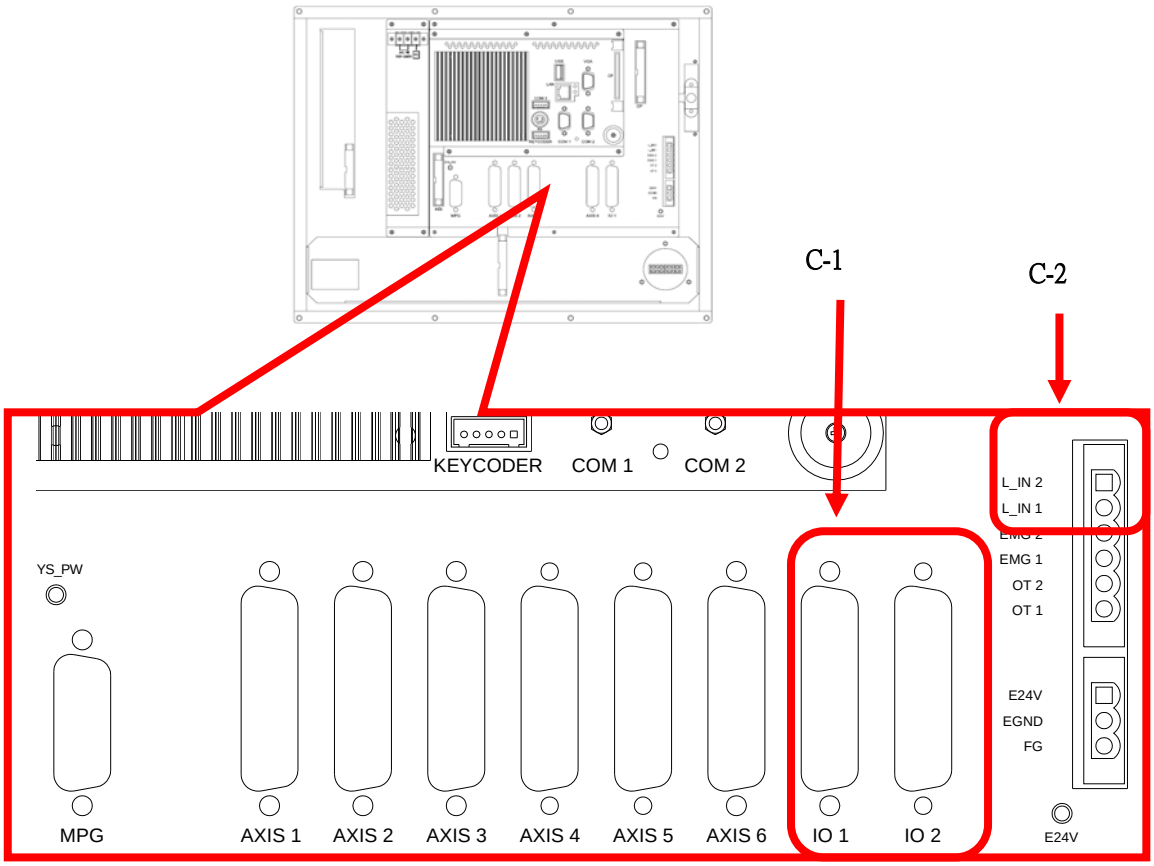
(1) OT connect is the over travel point and a safe point to protect hardware. Normally will be at short-circuit situation.

(2) When you want to make servo on, you will need to make OT and EMG to be short circuit.

(3) OT contact is close pin. When using several OT objects, please connect with serial way, and EMG will be short circuit state at normal using.

- **Because the OT Connector will have usage of parallel connection (1 hole with 2 lines), please make sure the connection is firm in order to prevent malfunction caused by poor contact.**
- **If the OT and EMG PIN are not used, please make it at short-circuit situation.**

C、I/O Control：

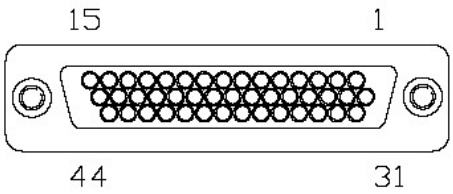


C-1：ON_BOARD IO Contact

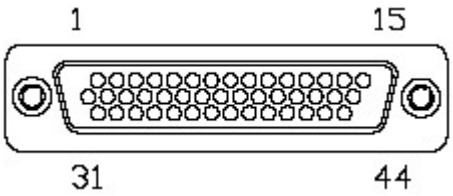
◎ Details：Controller offers 40IN/32OUT, every I/O port offers 20IN/16 OUT I/O interface, O is 24V level, Max.output current is 60mA, usually will be connected to REL boards. Input is NPN input（0V is valid）.

◎ Contact：Contact from controller side is HD_SUB 44PIN Male contact, I/O side is HD_SUB 44 PIN Female contact, PIN Definition is as below：

44 PIN HD Contact PIN



Female



Male

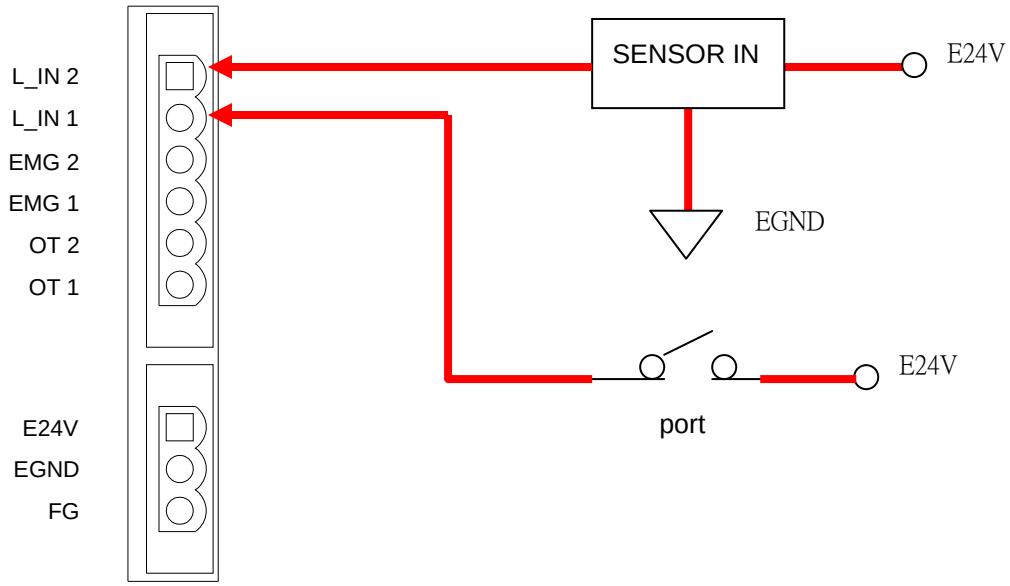
I/O hardware table

PIN	Definition	PIN	Definition	PIN	Definition
1	IN 00	16	IN 01	31	IN 02
2	IN 03	17	IN 04	32	IN 05
3	IN 06	18	IN 07	33	IN 08
4	IN 09	19	IN 10	34	IN 11
5	IN 12	20	IN 13	35	IN 14
6	IN 15	21	IN 16	36	IN 17
7	IN 18	22	IN 19	37	OUT 02
8	OUT 00	23	OUT 01	38	OUT 05
9	OUT 03	24	OUT 04	39	OUT 08
10	OUT 06	25	OUT 07	40	OUT 11
11	OUT 09	26	OUT 10	41	OUT 14
12	OUT 12	27	OUT 13	42	-
13	OUT 15	28	-	43	-
14	-	29	-	44	-
15	-	30	-	-	-

C-2：Quick IN Contact

◎ Details：Offer 2 IN, can be used on open mold different position(need to cooperated with software setting)

◎ Contact Details：European terminal, can be as below.



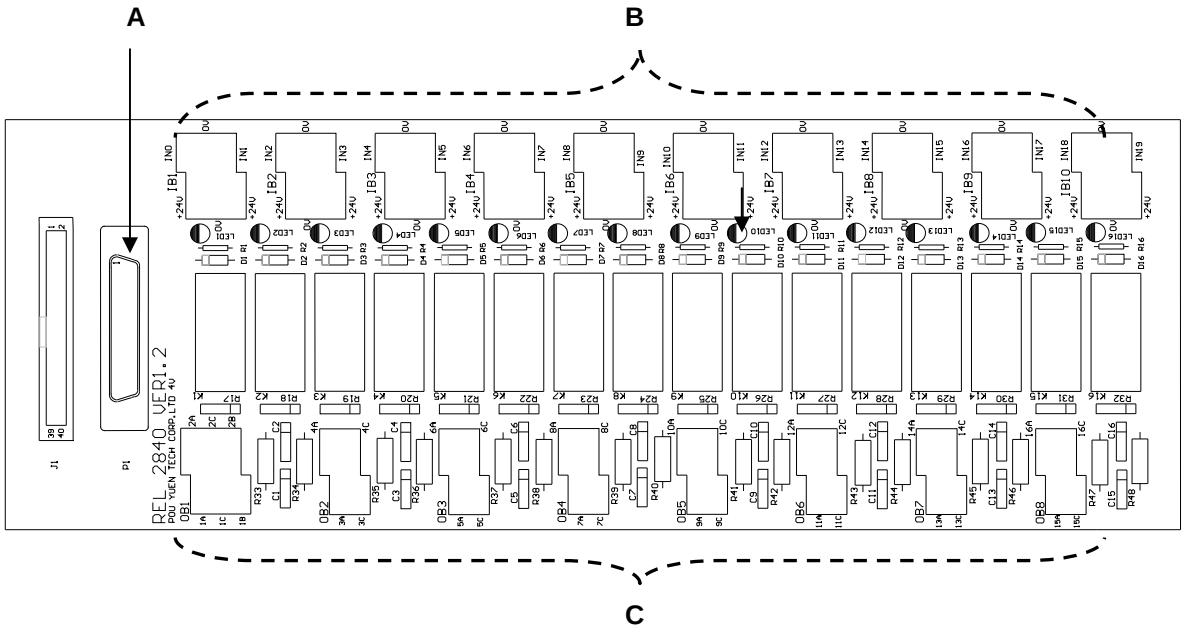
IN is 24V standard and same source with E24V, EGND, otherwise reading will be abnormal.

1.4 REL 2840

1.4.1 Specification

1. Offers 20 sets of IN and E24V/EGND input point with terminal lock.
2. Output side offers 2 sets of A,B,C connects and 14 sets of A,C connects, total for 16 sets of output.
3. Input connect capacity is AC 6A/250V with protection circuit.
4. This relay board use for AC/DC mix control, but the machanical relay board has life time and response time limit. For high frequency ON/OFF purpose, please use REL7816D.

1.4.2 Hardware LAYOUT



1.4.3 Contact Details

IO Connector			
Picture	Picture	Picture	Picture
A	A	A	A
B	B	B	B
C	C	C	C

Note 1：B Connector with terminal lock offers 20 sets of EGN and 20 sets of E24V Connector to cooperate with input.

Note 2：Every RELAY will have its own red LED, when the output is ON, the LED will be ON. Users can use this to debug for relay and output points.

1.4.4 **Setting**

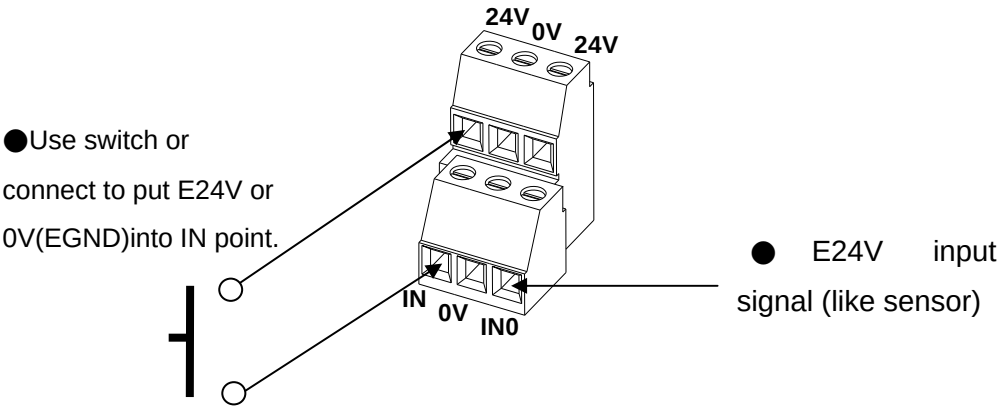
A：IO Control Contact

◎ Details：This connector is 20 IN/16 OUT, I/O control connector to connect with I/O1.

B：IN Contact

◎ Details：IN signal directed from this contact to system.

◎ IN contact example：

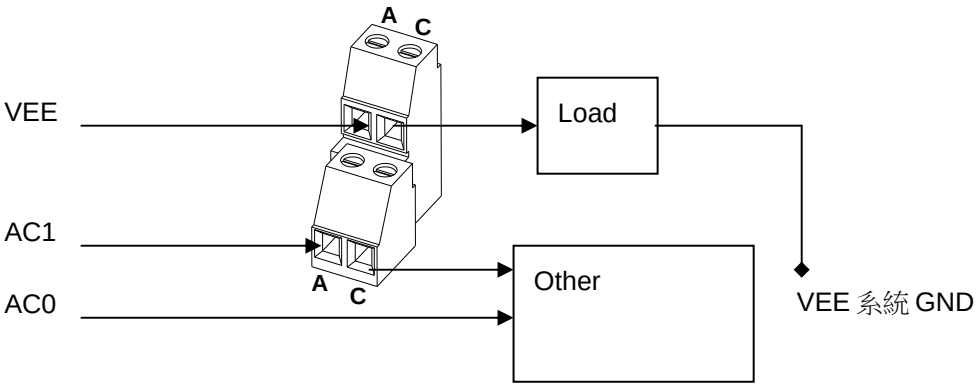


- **Please follow direction to do wiring, not make E24V and EGND at short circuit situation.**

C：OUT Contact

◎ Details：REL-2840 O Connector is at RELAY A and C, capacity is 6A / 250V.

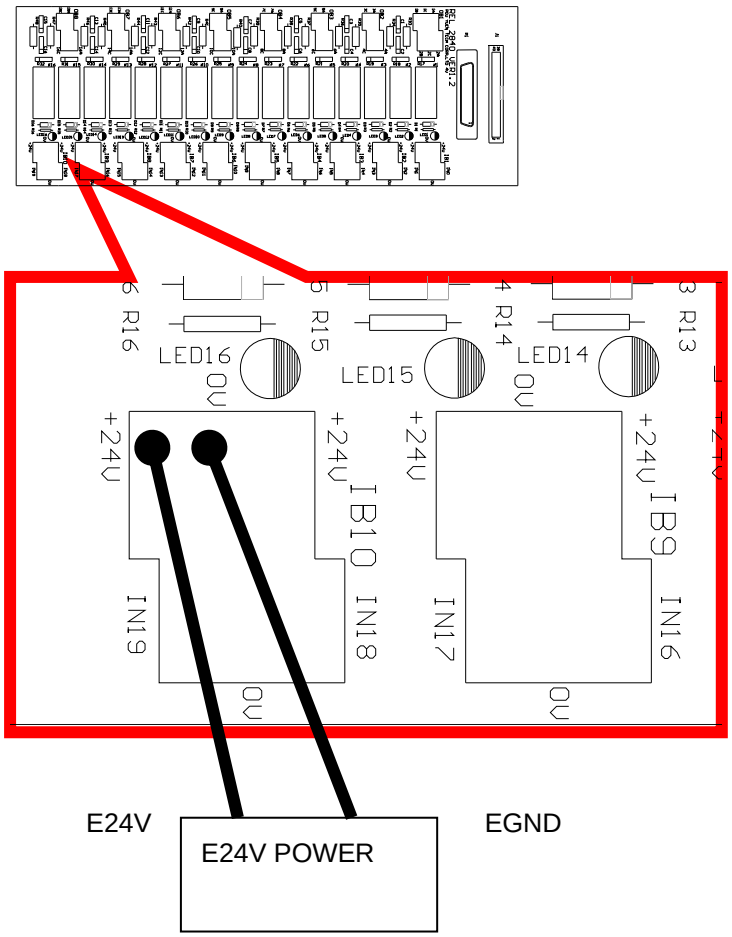
◎ OUT Contact Example：



- **OUT is mechanical pin, may not suitable for high speed ON/OFF**
- **DO NOT over capacity AC 6A/250V.**

1.4.5 Power wiring note

When Appling REL2840, please add wiring at IB10 as following.



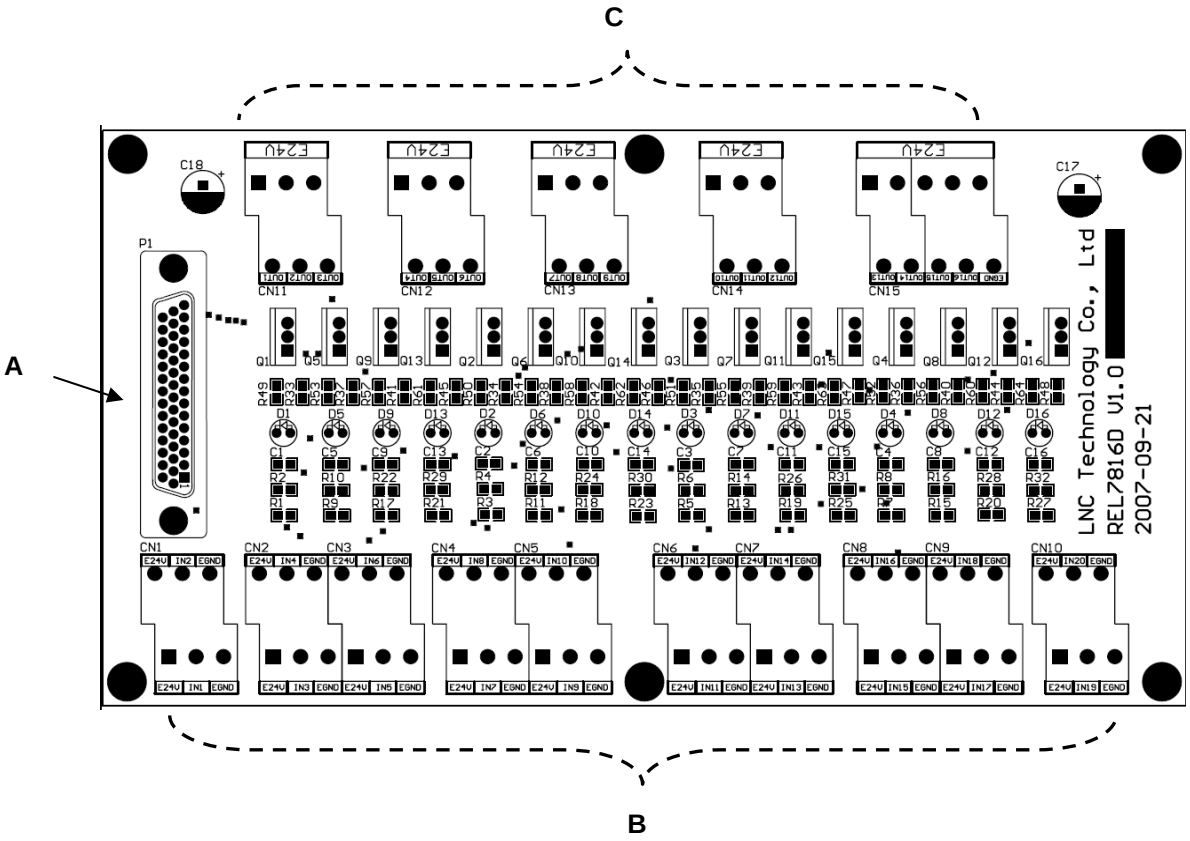
This POWER must same with IO module OR controller 24V power.

1.5 REL 7816D

1.5.1 Specification

1. Offer 20IN and E24V/EGND with terminal.
2. 16 MOSFET (SINK) output, used for DC control. High frequency ON/OFF.
3. Output Max 2A.

1.5.2 Hardware LAYOUT



1.5.3 Contact Details

IO Connector			
Picture	Component	Function	Description
A	D_SUB HD 44PIN Jack	20 IN / 16 OUT	USER IO
B	5.08mm Connector with lock	IN Connector	To external component
C	5.08mm Connector with lock	OUT Connector	To external component

Note1：B Connector with terminal lock offers 20 sets of EGN and 20 sets of E24V Connector to cooperate with input.

Note2：Every MOSFET have its own red LED, when the output is ON, the LED will be ON. Users can

use this to debug for relay and output points.

1.5.4 **Setting**

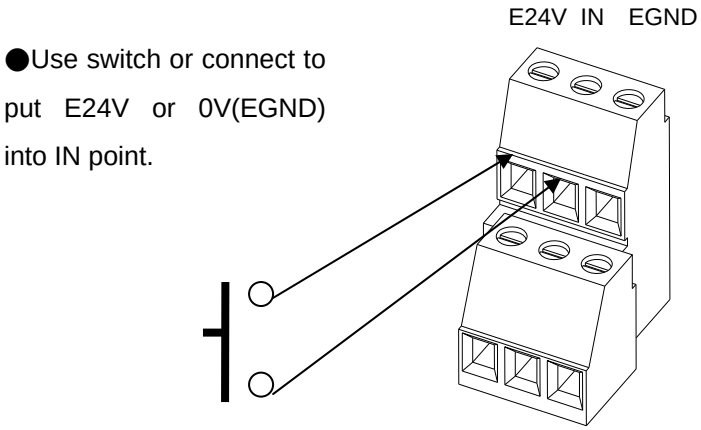
A：IO Control Connector

◎ Details：This connector is 20 IN/16 OUT IO control connector to connect with SIO and EIO.

B：IN Connector

◎ Details：IN signal will be lead in by these connectors, via IO control connector to return back to SIO and EIO.

◎ IN contact example：

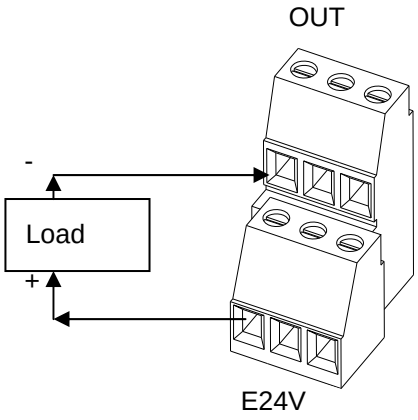


- **Please follow direction to do wiring, not make E24V and EGND at short circuit situation.**

C：OUT Contact

◎ Details：REL7816D Output is MOSFET acting, acting on (EGND), output max 2A.

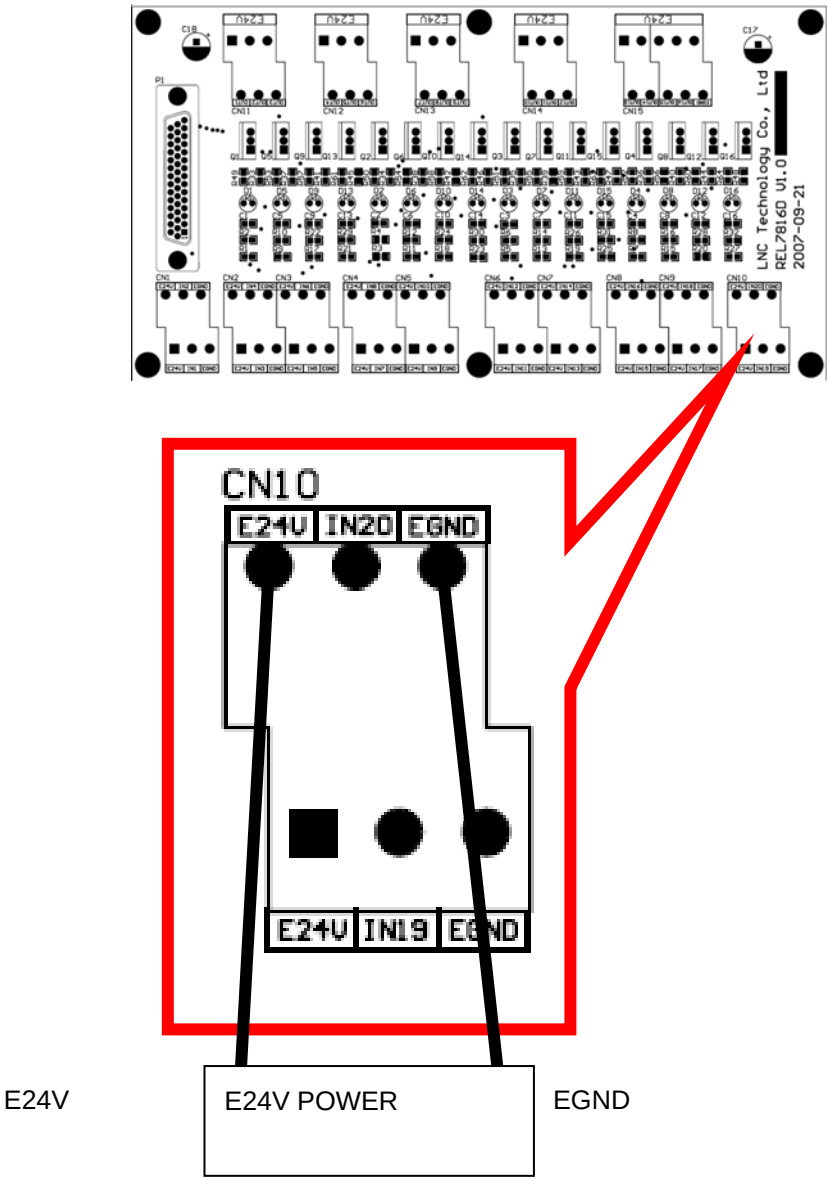
◎ OUT Contact example：



- **OUTPUT only use with DC.**
- **Max current 2A, otherwise it will damage the board.**

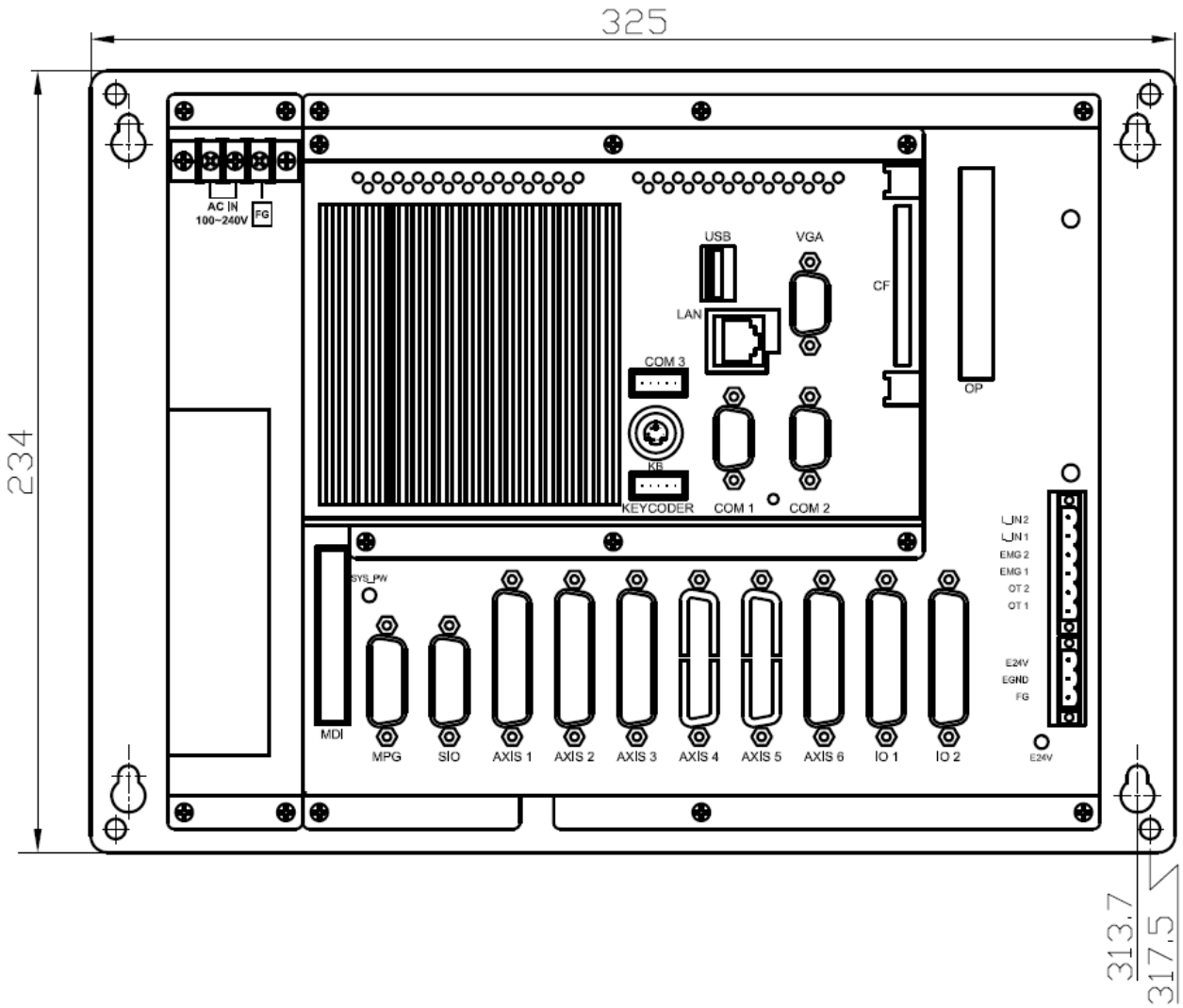
1.5.5 Power wiring note

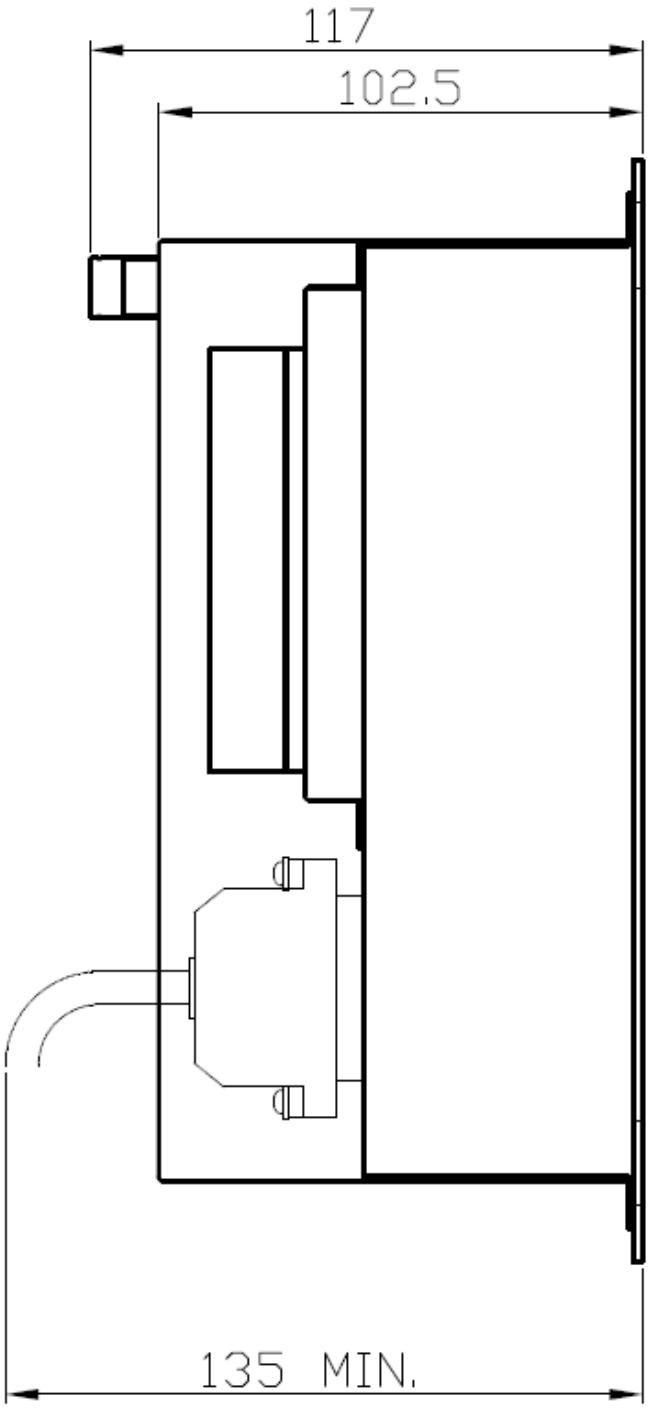
This card must add wire on CN10 Connector as following.



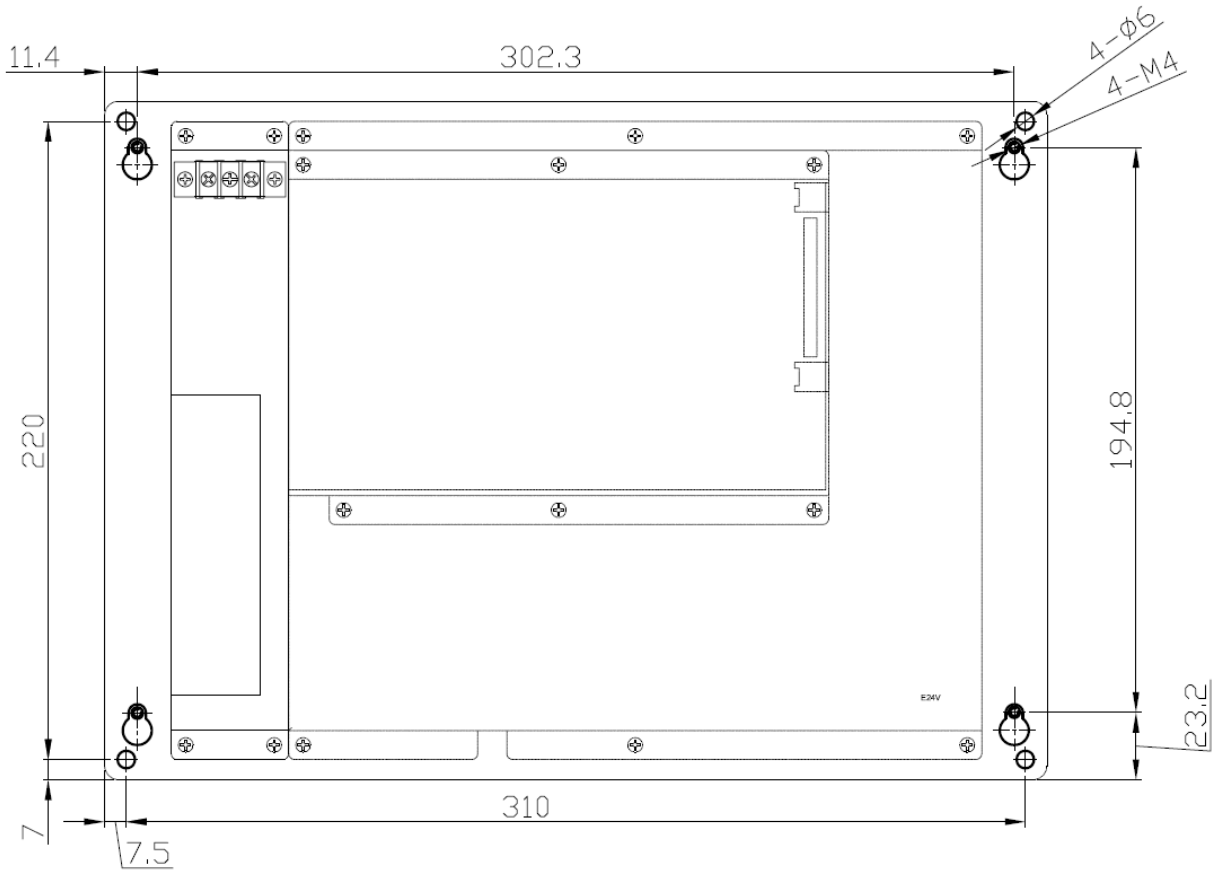
2 Dimension & Instalation

2.1 Dimension

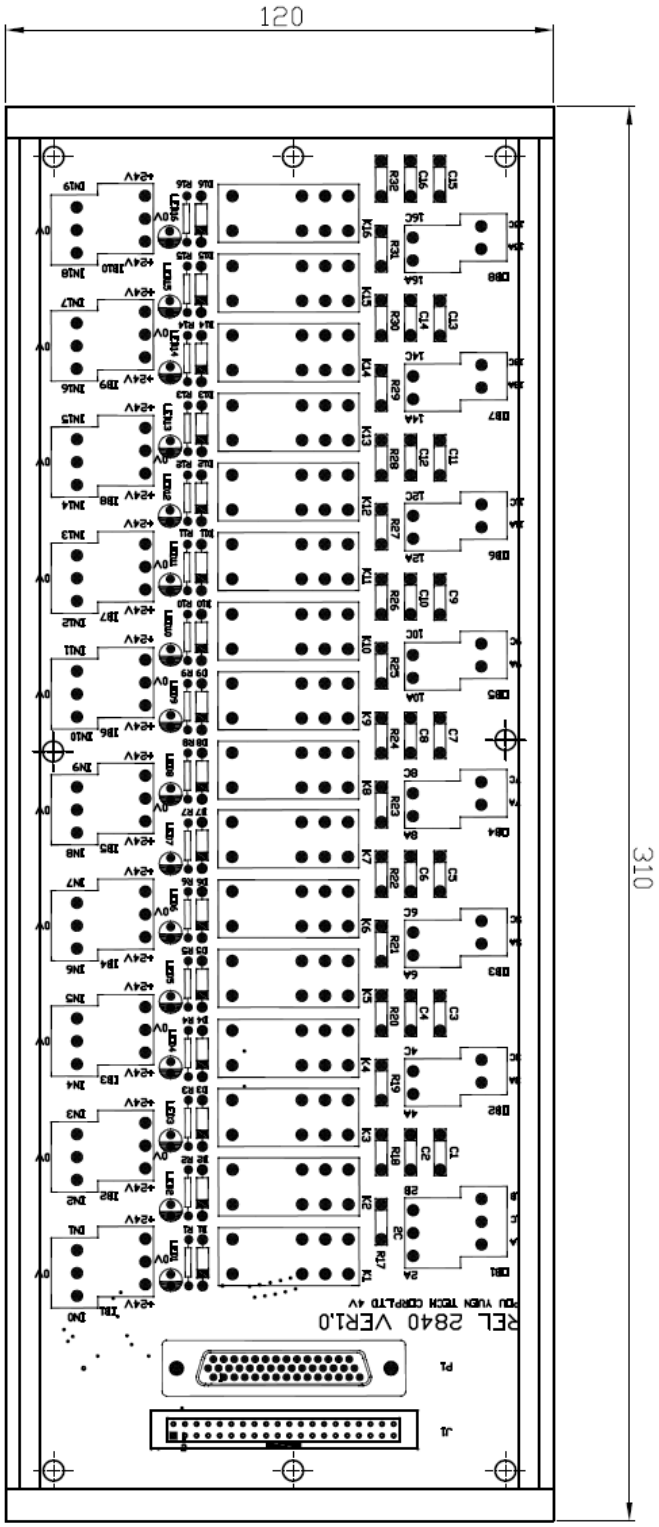



117
102.5
135 MIN.

2.2 Chasis

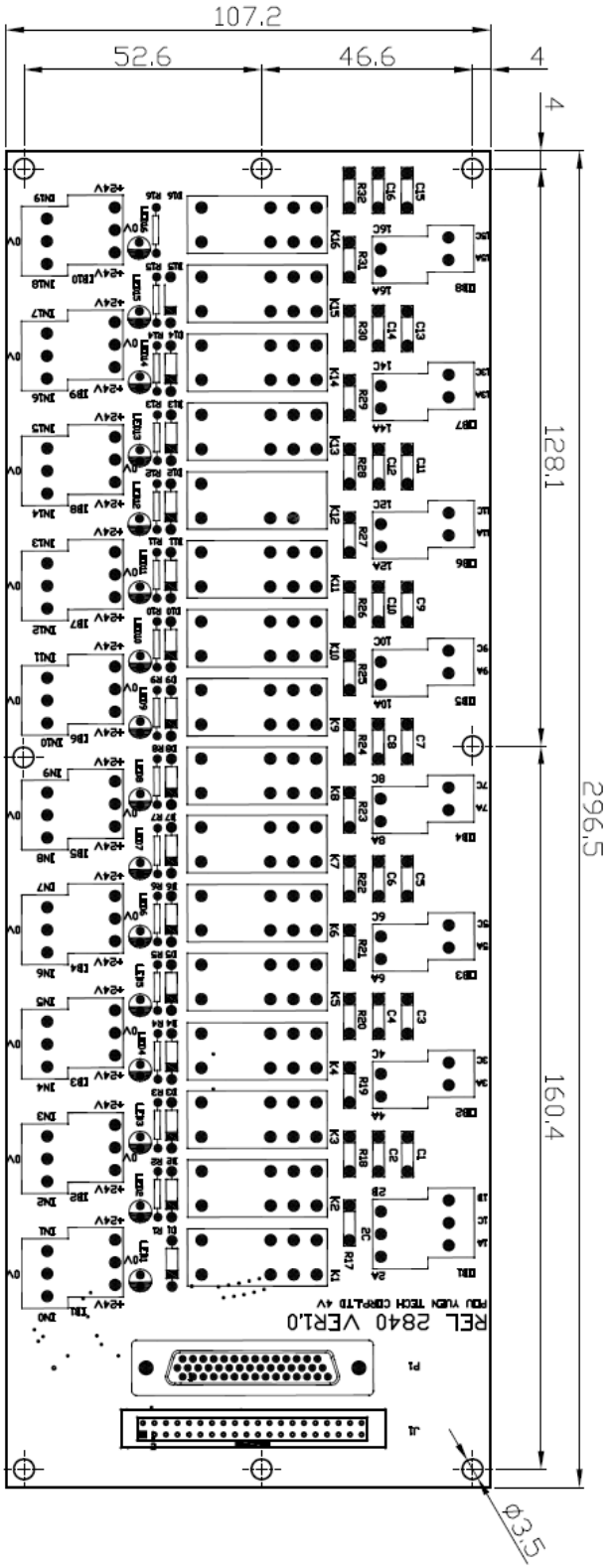


2.3 REL2840（With alumimum rail ）



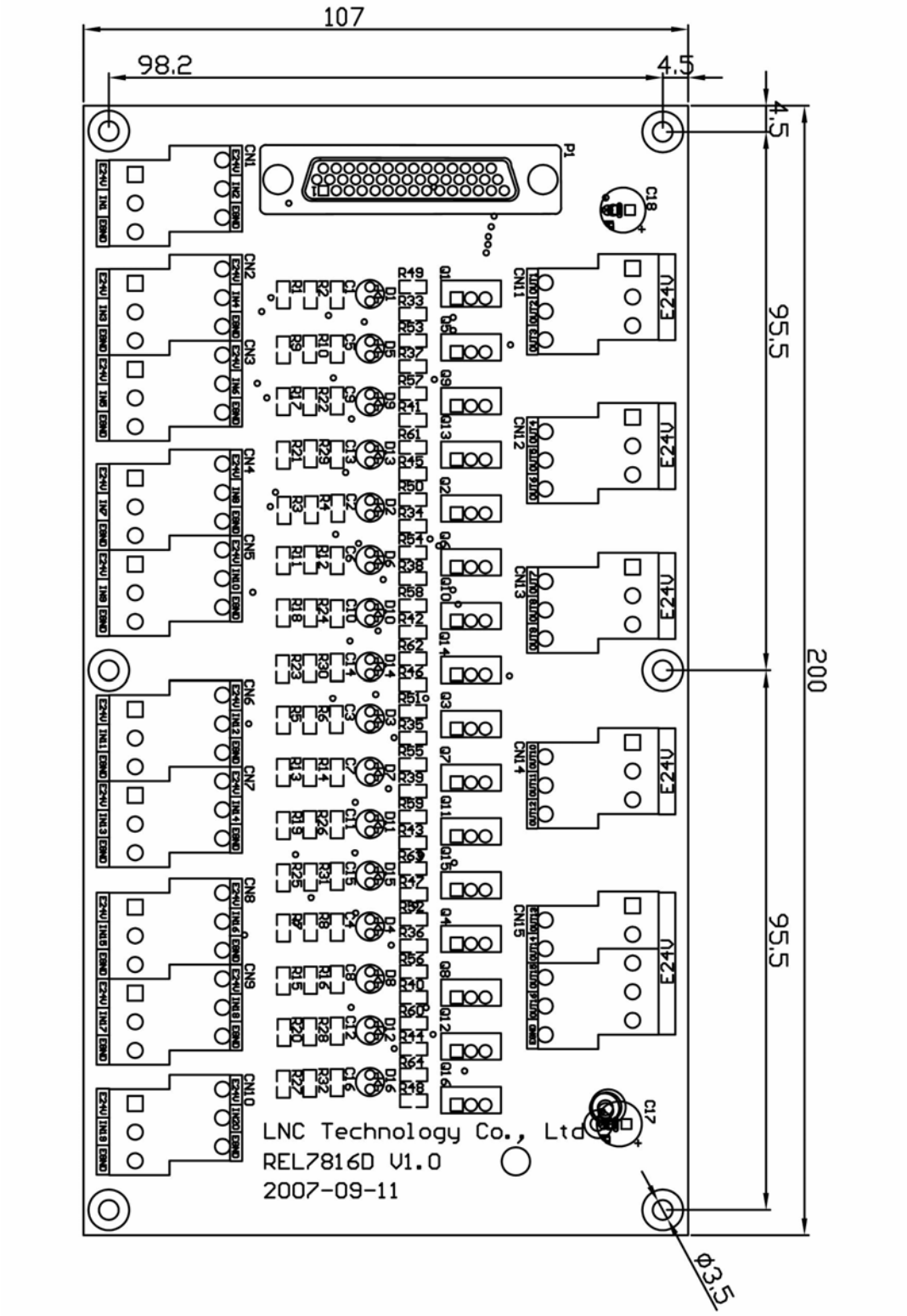
※Please follow the chassis dimensions, if the screw hole does not match and force to apply may cause damage.
※Aluminum rail length min. is 320mm.

2.4 REL2840（Without alumimum rail）



Please follow the chassis dimensions, if the screw hole does not match and force to apply may cause damage.

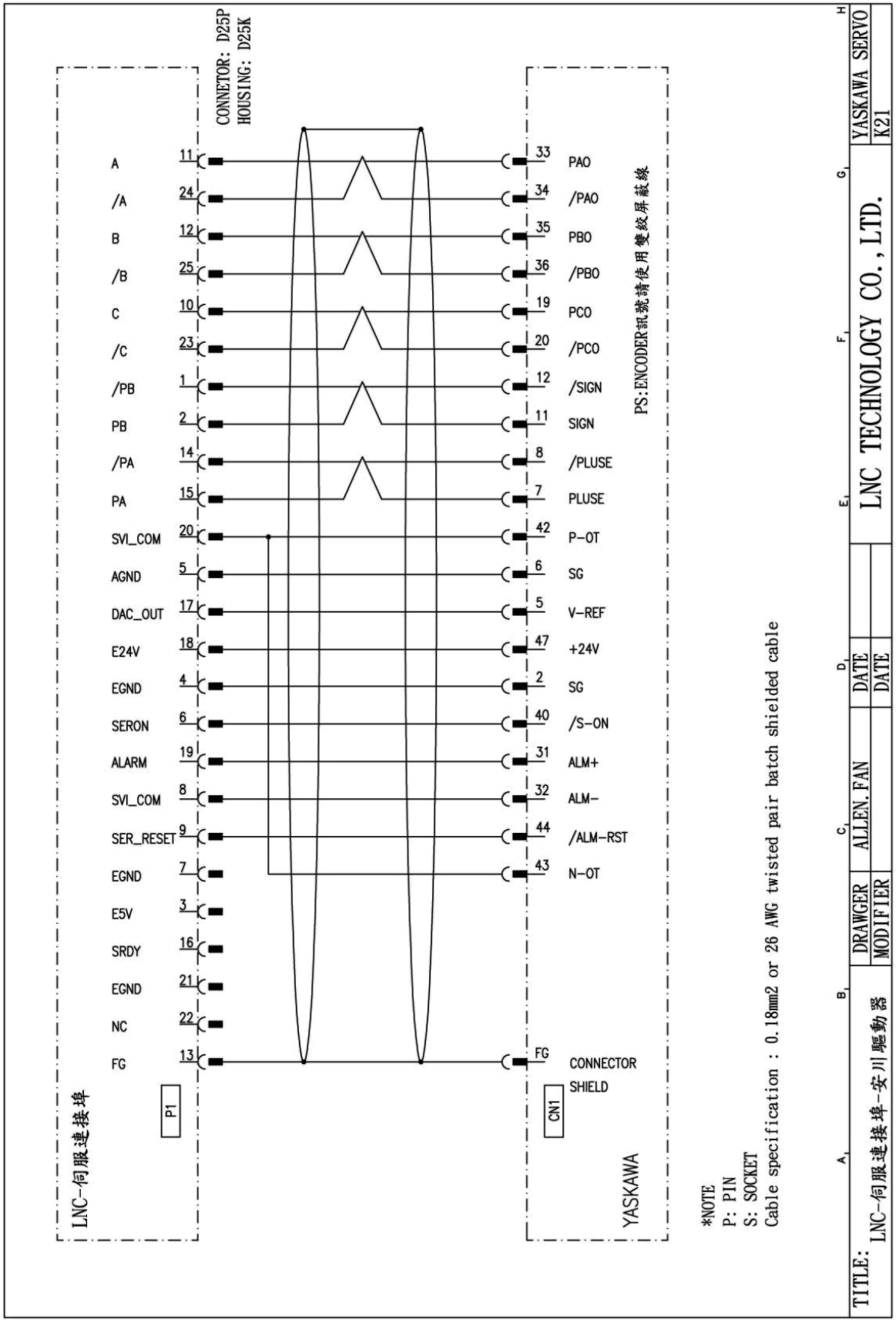
2.5 REL7816D

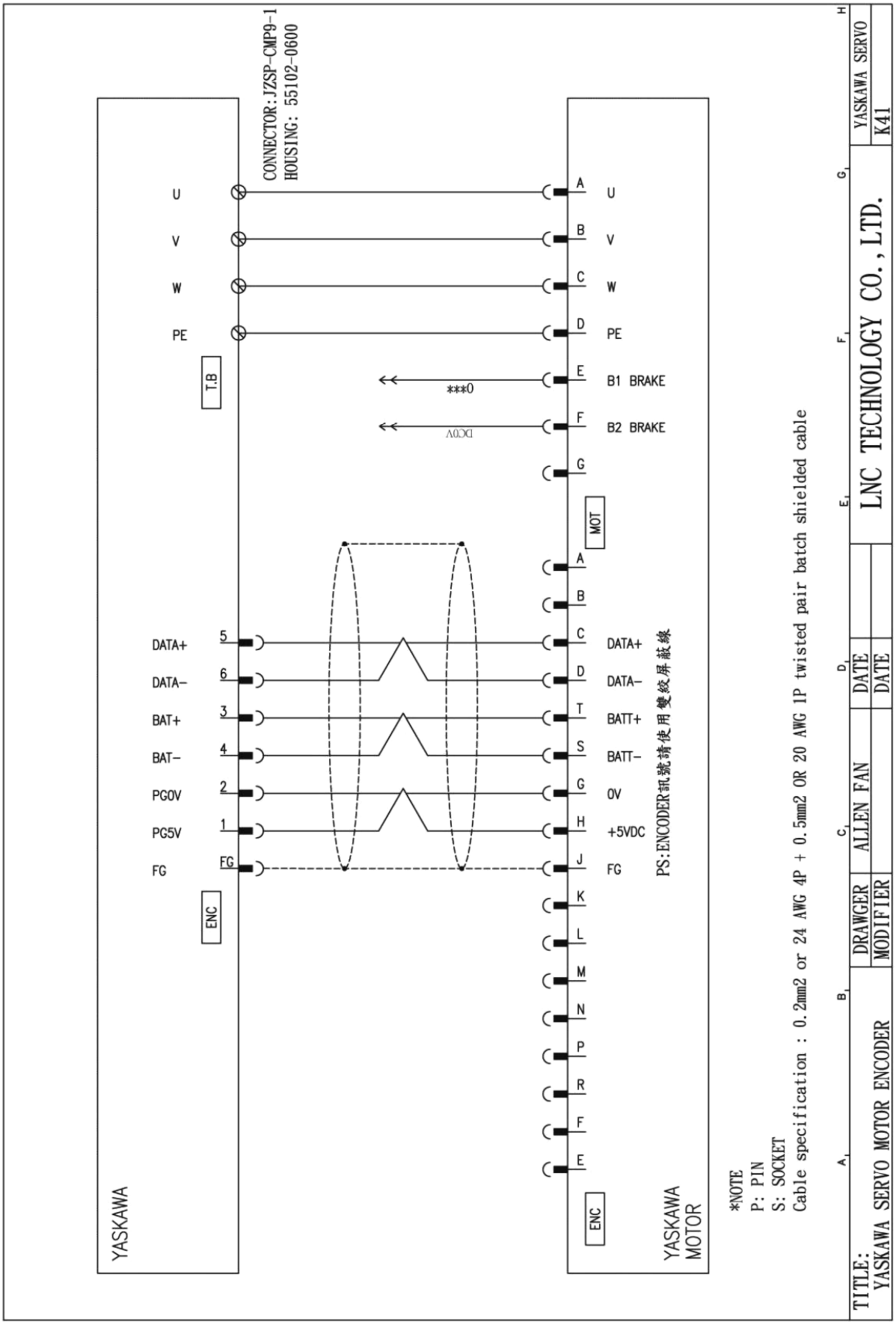


Please follow the chassis dimensions, if the screw hole does not match and force to apply may cause damage.

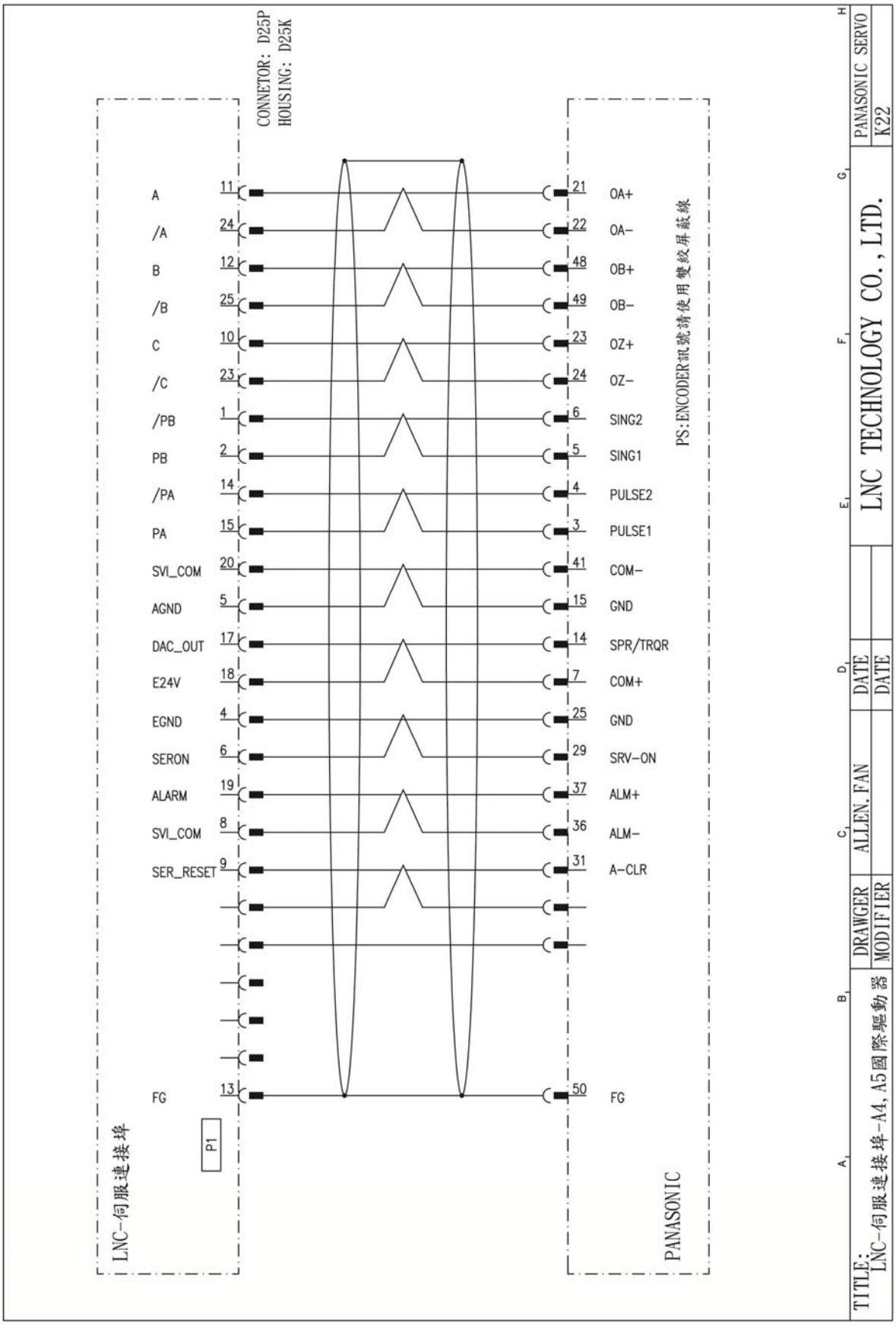
Appendix A Servo Wiring Example

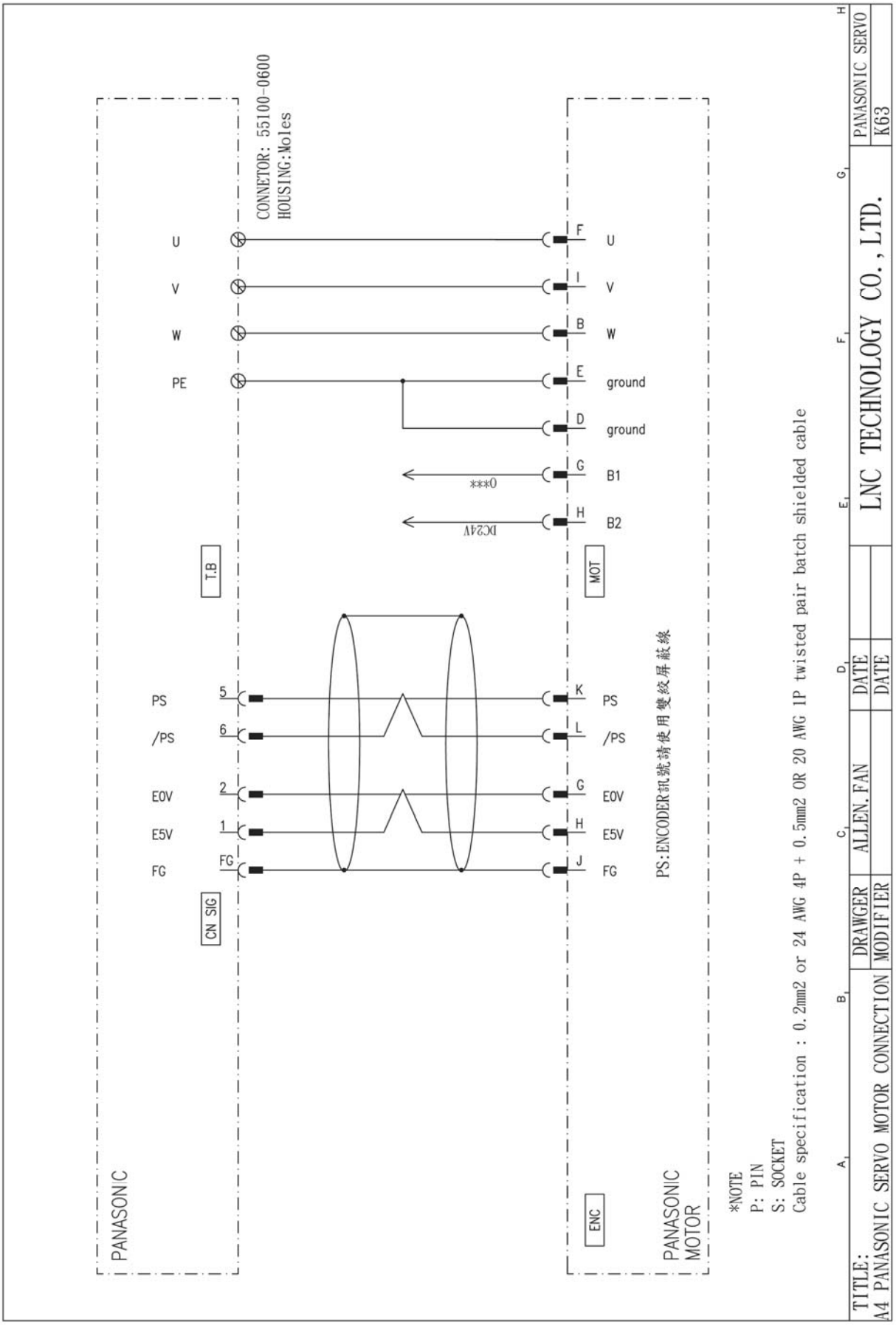
A1 Yaskawa Servo Wiring Example



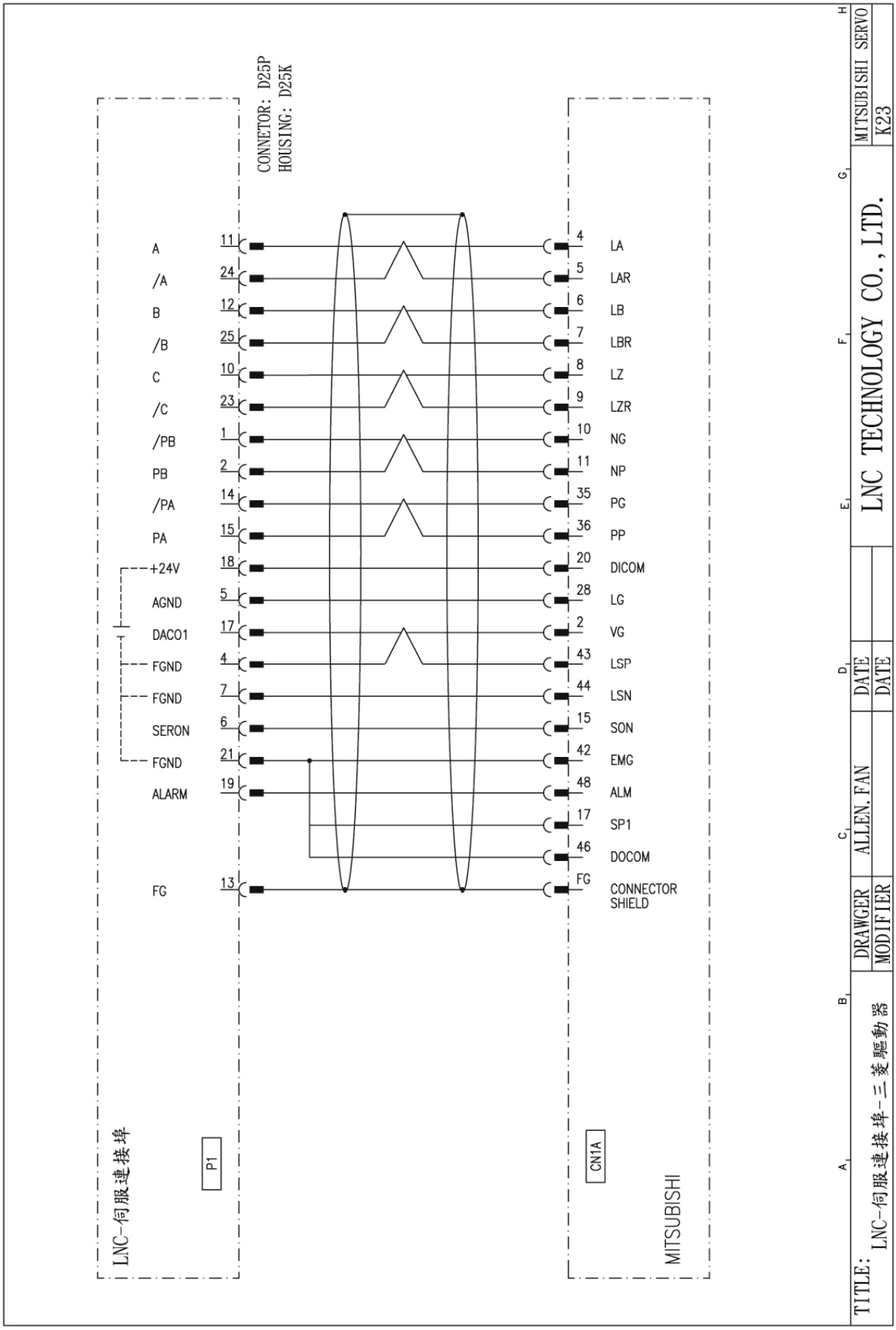

CONNECTOR:JZSP-CMP9-1
HOUSING: 55102-0600
YASKAWA
T.B
U
V
W
PE
ENC
DATA+
DATA-
BAT+
BAT-
PG0V
PG5V
FG
5
6
3
4
2
1
FG
***0
DC0V
YASKAWA
MOTOR
MOT
A
B
C
D
E
F
G
ENC
U
V
W
PE
B1 BRAKE
B2 BRAKE
DATA+
DATA-
BATT+
BATT-
0V
+5VDC
FG
PS:ENCODER訊號請使用雙絞屏蔽線
*NOTE
P: PIN
S: SOCKET
Cable specification : 0.2mm2 or 24 AWG 4P + 0.5mm2 OR 20 AWG 1P twisted pair batch shielded cable
TITLE:
YASKAWA SERVO MOTOR ENCODER
DRAWGER
MODIFIER
ALLEN FAN
DATE
DATE
LNC TECHNOLOGY CO., LTD.
YASKAWA SERVO
K41

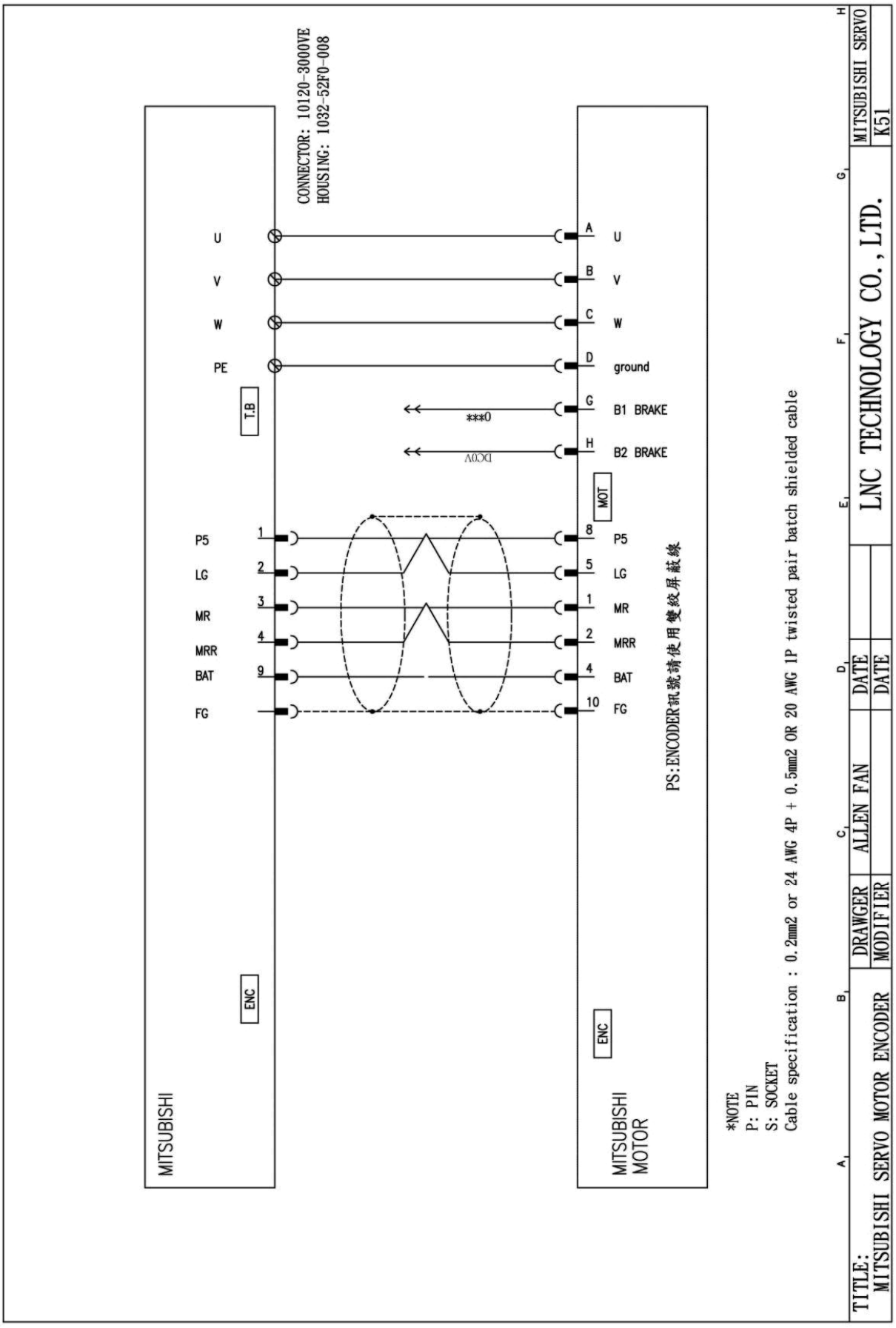
A2 Panasonic Servo Wiring Example




PANASONIC
CONNETOR: 55100-0600
HOUSING:Moles
U
V
W
PE
PS
/PS
E0V
E5V
FG
T.B
CN SIG
F
I
B
E
D
G
H
K
L
G
H
J
U
V
W
ground
ground
B1
B2
MOT
ENC
PANASONIC
MOTOR
PS:ENCODER訊號請使用雙絞屏蔽線
*NOTE
P: PIN
S: SOCKET
Cable specification : 0.2mm2 or 24 AWG 4P + 0.5mm2 OR 20 AWG 1P twisted pair batch shielded cable
TITLE:
A4 PANASONIC SERVO MOTOR CONNECTION
DRAWGER
MODIFIER
ALLEN.FAN
DATE
DATE
LNC TECHNOLOGY CO., LTD.
PANASONIC SERVO
K63

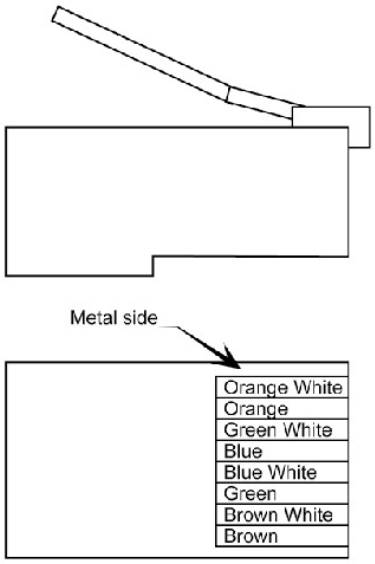
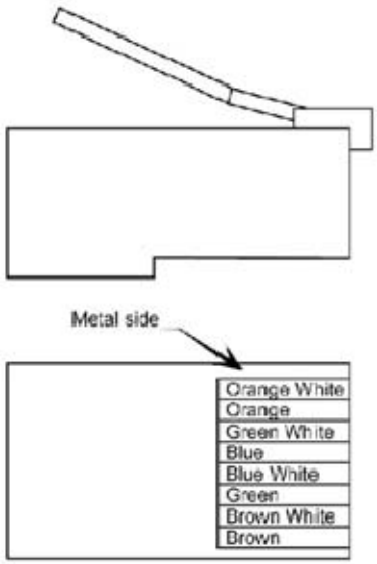
A3 Mitsubishi Servo Wiring Example



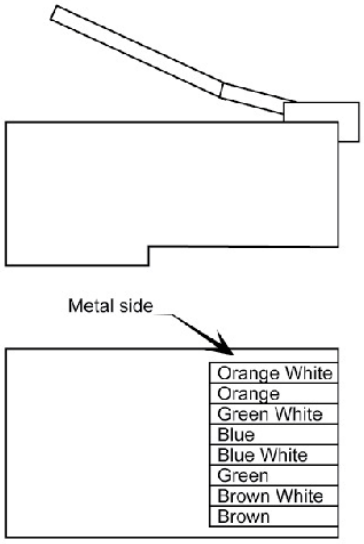
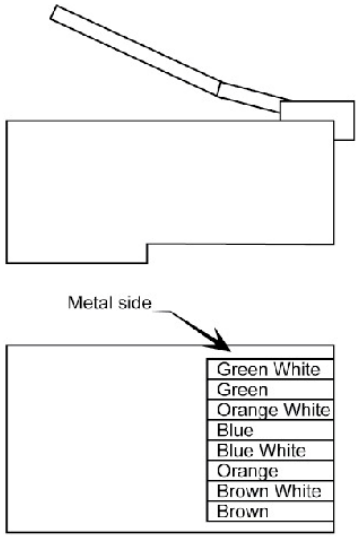

CONNECTOR: 10120-3000VE
HOUSING: 1032-52P0-008
MITSUBISHI
ENC
T.B
U
V
W
PE
P5
LG
MR
MRR
BAT
FG
1
2
3
4
9
A
B
C
D
G
H
***0
DC0V
MOT
8
5
1
2
4
10
ENC
MITSUBISHI
MOTOR
PS:ENCODER訊號請使用雙絞屏蔽線
*NOTE
P: PIN
S: SOCKET
Cable specification : 0.2mm2 or 24 AWG 4P + 0.5mm2 OR 20 AWG 1P twisted pair batch shielded cable
LNC TECHNOLOGY CO., LTD.
TITLE:
MITSUBISHI SERVO MOTOR ENCODER
DRAWGER
ALLEN FAN
MODIFIER
DATE
DATE
MITSUBISHI SERVO
K51

Appendix B Net cable instruction

Ordinary HUB connects with controller:

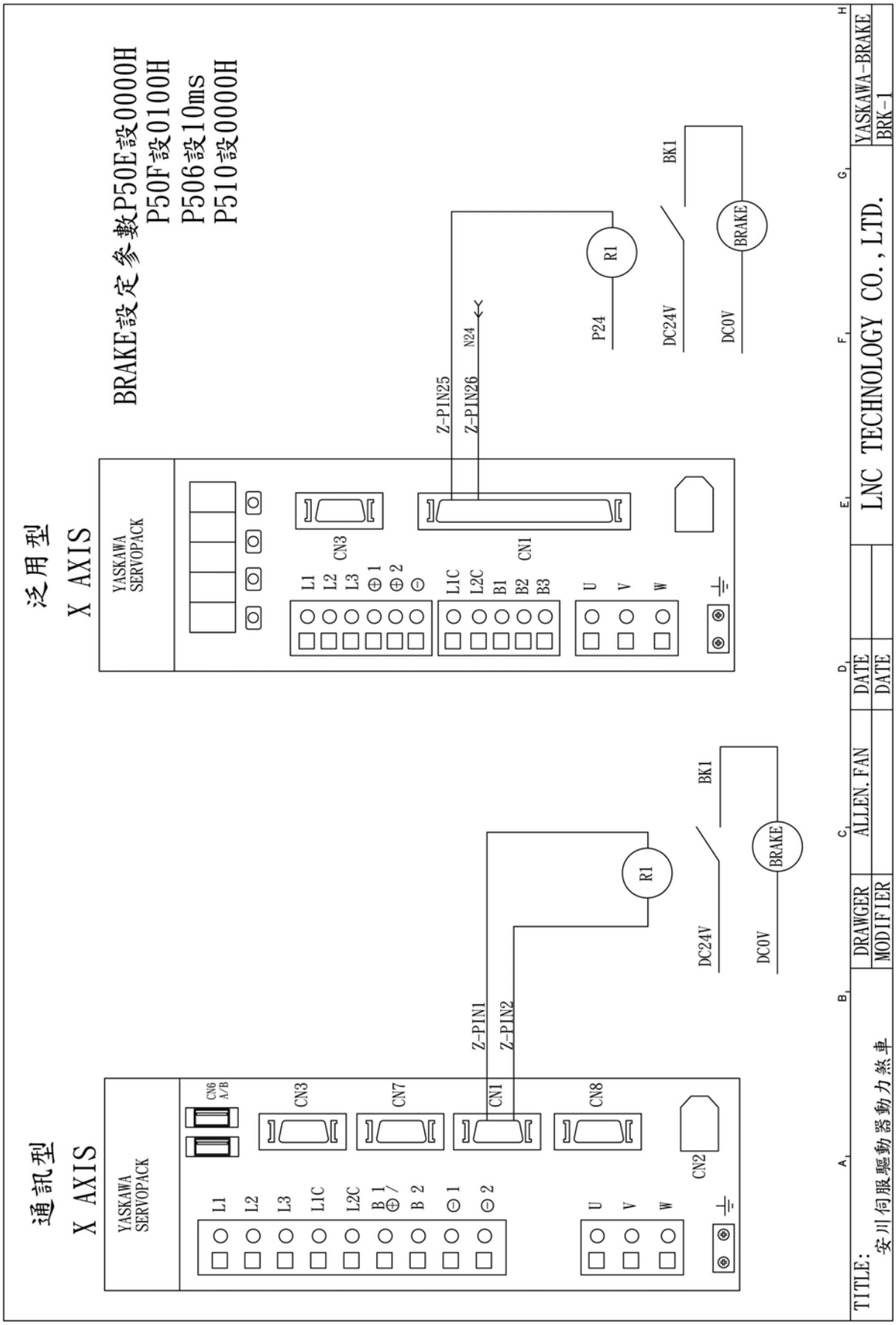
Ordinary RJ45 cable	
PC	NC
	

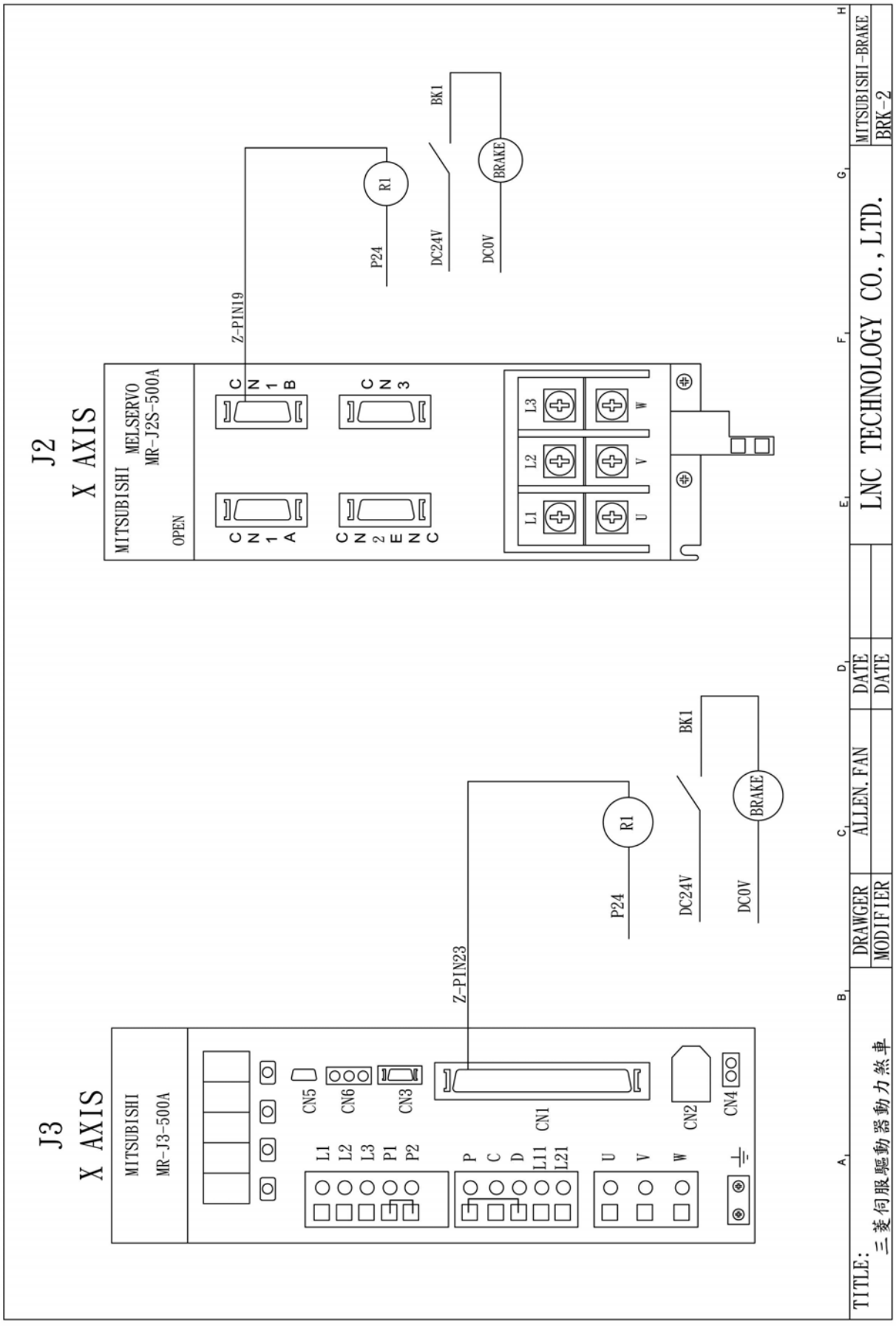
Directly connection

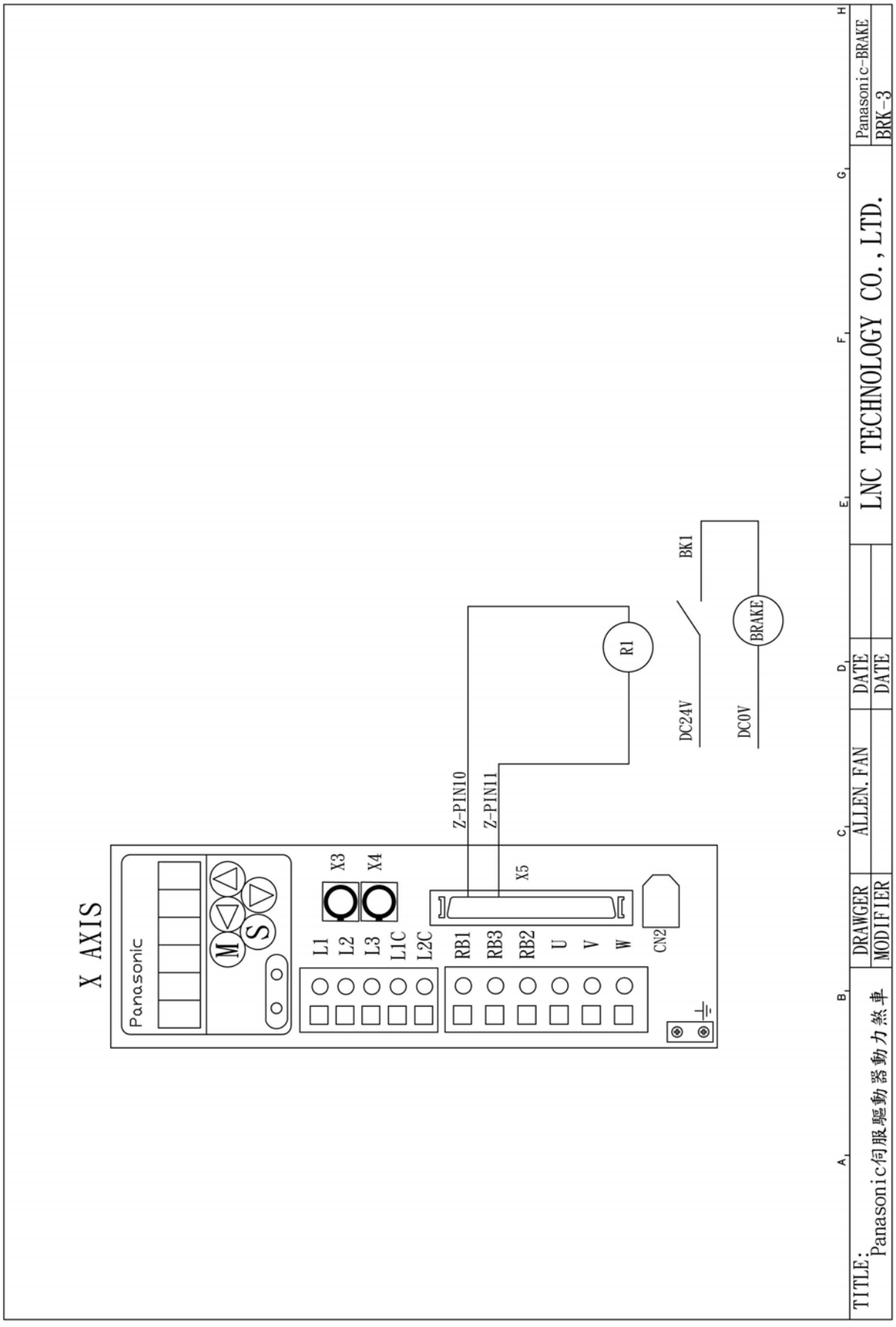
One to One link, RJ45 instruction	
PC	NC
	

Appendix C Wiring

BK-Servo Drive Brake




J2
X AXIS
MITSUBISHI MELSERVO
MR-J2S-500A
OPEN
CN1A
CN1B
CN2
CN3
L1
L2
L3
U
V
W
Z-PIN19
P24
R1
DC24V
DC0V
BK1
BRAKE
J3
X AXIS
MITSUBISHI
MR-J3-500A
CN5
CN6
CN3
CN1
CN2
CN4
L1
L2
L3
P1
P2
P
C
D
L11
L21
U
V
W
Z-PIN23
P24
R1
DC24V
DC0V
BK1
BRAKE
LNC TECHNOLOGY CO., LTD.
TITLE:
三菱伺服驅動器動力煞車
DRAWGER
MODIFIER
ALLEN. FAN
DATE
DATE
MITSUBISHI-BRAKE
BRK-2


X AXIS
Panasonic
M
S
X3
X4
X5
L1
L2
L3
L1C
L2C
RB1
RB3
RB2
U
V
W
CN2
Z-PIN10
Z-PIN11
R1
BK1
DC24V
DC0V
BRAKE
TITLE:
Panasonic伺服驅動器動力煞車
DRAWGER
MODIFIER
ALLEN. FAN
DATE
DATE
LNC TECHNOLOGY CO., LTD.
Panasonic-BRAKE
BRK-3