

GSK983M Milling CNC System

Connection Manual



广州数控设备有限公司
GSK CNC EQUIPMENT CO., LTD.



The operating manual describes all matters concerning the operation of the system in detail as much as possible. However, it is impractical to give particular descriptions of all unnecessary and/or unavailable works on the system due to the length limit of the manual, specific operations of the product and other causes. Therefore, the matters not specified herein may be considered impractical or unavailable.



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Company Profile

GSK CNC EQUIPMENT CO., LTD(GSK) , CNC Industry Base of South China, is responsible for the National High Technology Research and Development Program of China (863 Program): Moderate CNC Industrialization Key Technology. For ten years, we are exclusively engaged in research, Development, manufacture, sale, training and popularization of Machine Tool CNC system, Servo Motor and driver, and other mechanical products. Today, GSK has already expressed into a large-scale new high-tech enterprise that deals with research, teaching, working and trading. Our products support more than 60 domestic manufacturers of machine tools with after-sales service network through the country. With a yield in the lead in China from 2000 to 2005 in succession, GSK series products are in great demand in the domestic demand and have a ready sale in Southeast Asia at high performance-to-price ratio.

Field technical support services

Field support services are available when you encounter a problem insolvable through telephone. GSK CNC Equipment Company Limited will designate a technical support engineer to the field to solve technical problems for you.

Chinese version of all technical documents in Chinese and English languages is regarded as final.

Foreword

Dear user,

We are really grateful for your patronage and purchase of GSK983M milling CNC system, which is made by GSK CNC Equipment Co., Ltd.

This manual consists of two volumes. Volume I mainly describes the specifications and programming of the system while Volume II operations, all codes, parameters, I/O interfaces and other appendices.



This system can only be operated by authorized and qualified personnel as improper operations may cause accidents. Please carefully read this operating manual before usage.

All specifications and designs herein are subject to change without further notice.

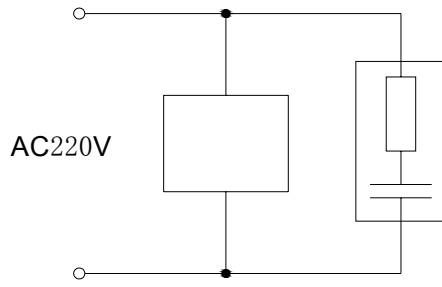
We are full of heartfelt gratitude to you for supporting us in the use of GSK's products.

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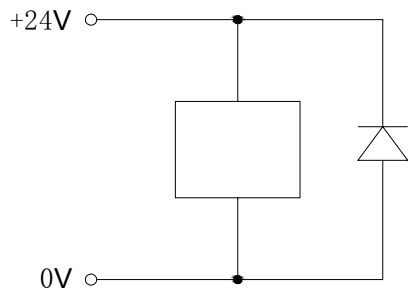
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Precautions for Connection

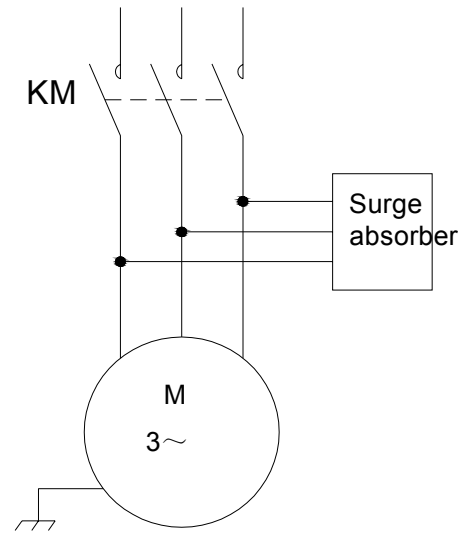
1. Power should be supplied by isolating transformer.
2. Shells of the system parts and the machine must be securely grounded.
3. The system should be installed far away from place where the interference may occur (such as converter, AC contactor, static generator, high voltage generator and subsection devices of power line); and the space dimension around the system should also be complied with the installation dimension described in the manual.
4. The environment around the system should conform to the requirements described in the manual.
5. The signal cables and control cables of weak current should be distributed far away from the place where there are strong current and strong electromagnetic interference; they should be distributed straightly against interfering signal, otherwise, it easily receives the interfering signal.
6. Interference suppression: Connect parallel RC loop to the two connector lugs of AC coil(Fig.1) and the RC loop should be fixed as near as possible to the inductive load; connect reversely parallel freewheeling diode at the two connector lugs of DC coil(Fig.2); connect parallel surge absorber at the connector lugs of AC motor coil(Fig.3).



(Fig. 1)

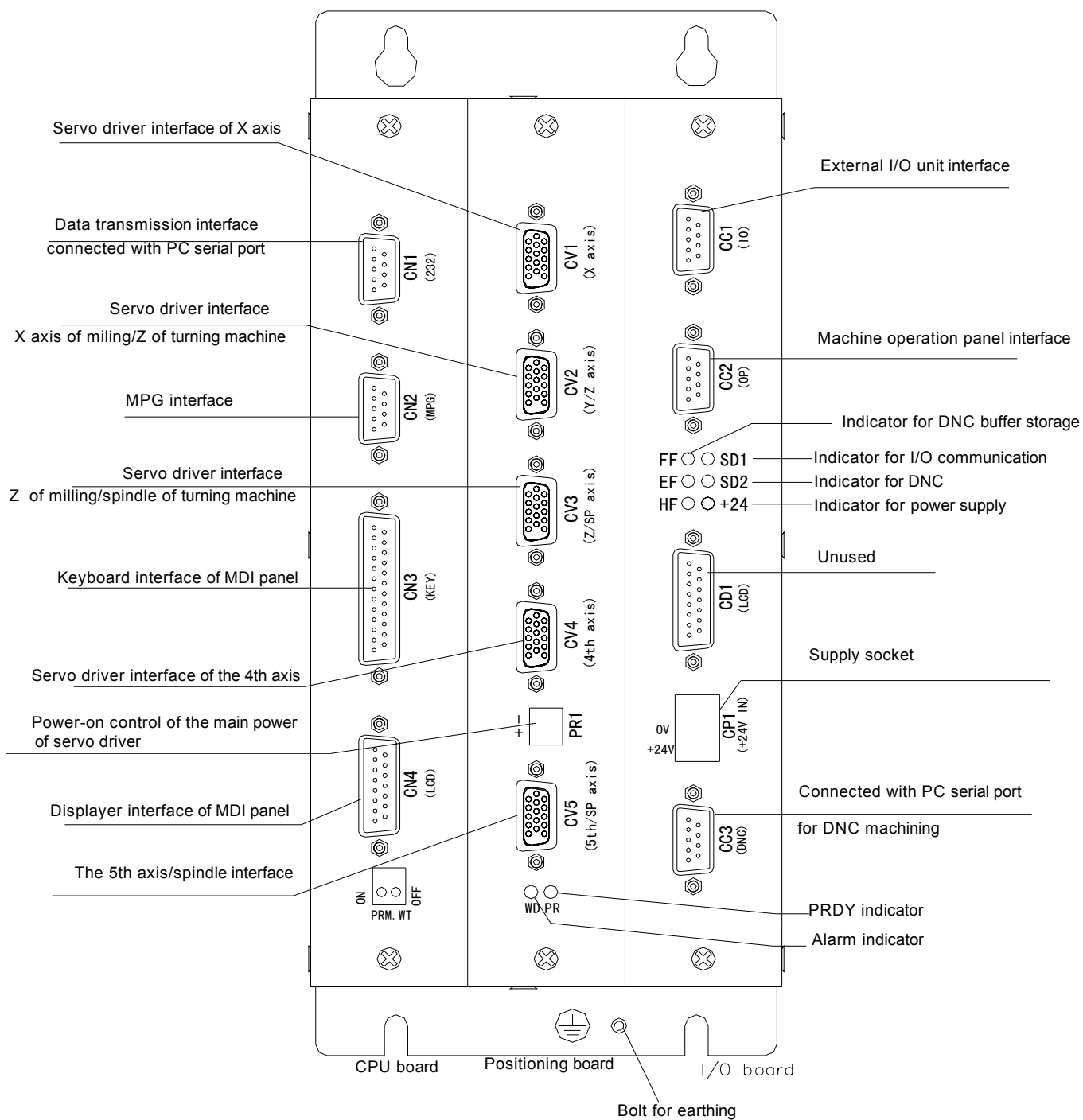


(Fig. 2)

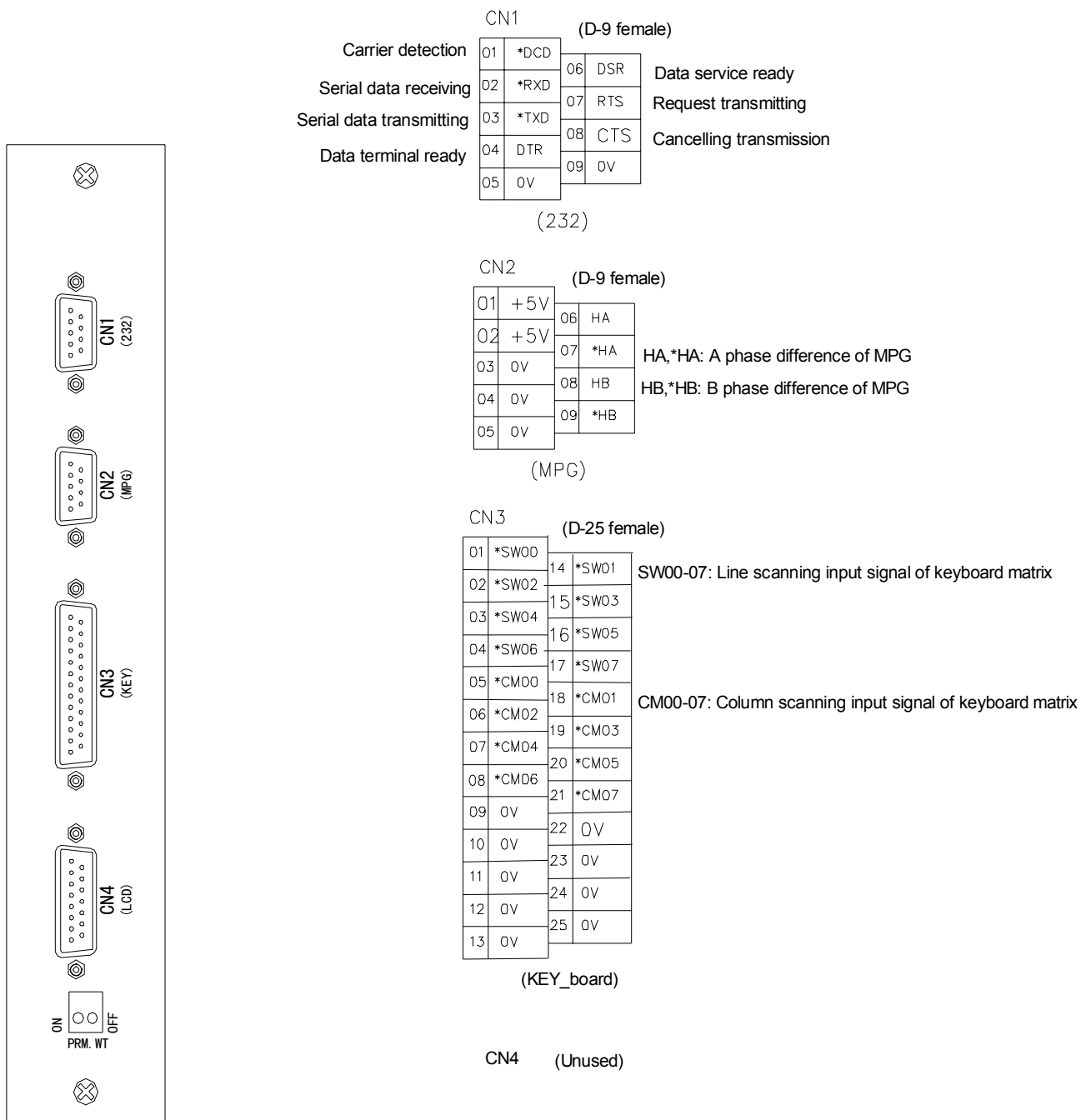


(Fig. 3)

1. Interface Layout of the System

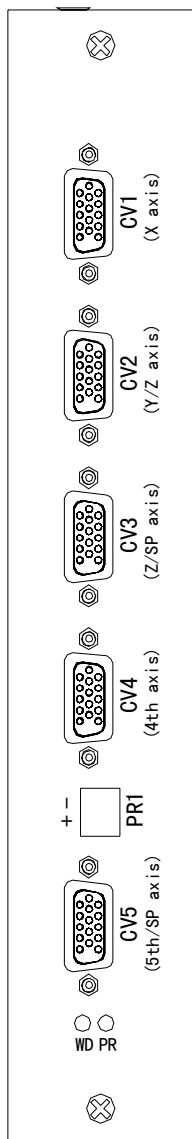


2. Interface Layout of CPU Board



Note: PRM.WT is the switch for parameters writing.

3. Interface Layout of Position Control Board



CV1 (D-15 female)

01	+5V	06	PCZX	11	*PCZX
02	0v	07	PCAX	12	*PCAX
03	+24v	08	PCBX	13	*PCBX
04	SRDYX	09	SONX+	14	SONX-
05	VCX	10	0V	15	0V

(X Axis SV I/F)

CV4 (D-15female)

01	+5V	06	PCZ4	11	*PCZ4
02	0v	07	PCA4	12	*PCA4
03	+24v	08	PCB4	13	*PCB4
04	SRDY4	09	SON4+	14	SON4-
05	VC4	10	0V	15	0V

(4th Axis SV I/F)

CV2 (D-15 female)

01	+5V	06	PCZY	11	*PCZY
02	0v	07	PCAY	12	*PCAY
03	+24v	08	PCBY	13	*PCBY
04	SRDYY	09	SONY+	14	SONY-
05	VCY	10	0V	15	0V

(Y/Z Axis SV I/F)

PR1

02	PRDY-
01	PRDY+

CV3 (D-15 female)

01	+5V	06	PCZZ	11	*PCZZ
02	0v	07	PCAZ	12	*PCAZ
03	+24v	08	PCBZ	13	*PCBZ
04	SRDYZ	09	SONZ+	14	SONZ-
05	VCZ	10	0V	15	0V

(Z Axis SV I/F)

CV5 (D-15 female)

01	+5V	06	PCZ5	11	*PCZ5
02	0v	07	PCA5	12	*PCA5
03	+24v	08	PCB5	13	*PCB5
04	SRDY5	09	SON5+	14	SON5-
05	VC5	10	0V	15	0V

(5th Axis SV I/F)

Note:

PCAX~PCA5: A phase feedback signal of encoder (pulse signal of difference input ,drive → NC)

PCBX~PCB5: B phase feedback signal of encoder (pulse signal of difference input ,drive → NC)

PCZX~PCZ5: Z phase feedback signal of encoder (pulse signal of difference input ,drive → NC)

SONX+~SON5+,SONX-~SON5-: enable signal (on-off signal, NC → drive)

SRDYX~SRDY5: Servo ready (on-off signal, drive → NC)

VCX~VC5: Speed control voltage (DC voltage, NC → drive)

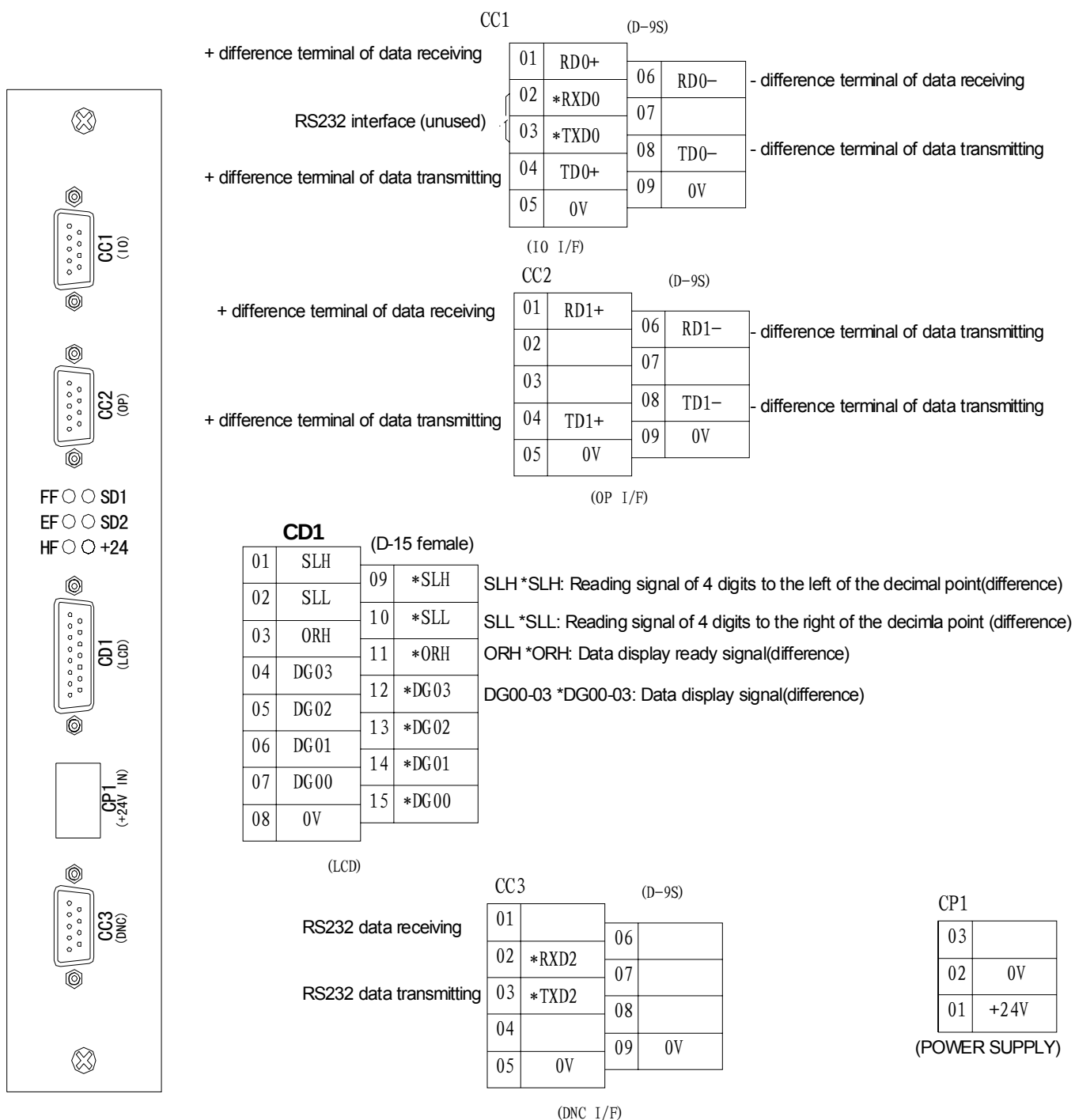
"**" stands for X, Y, Z, 4th, and 5th axes

PRDY+ signal is used for the power-on control of the main power of servo driver;

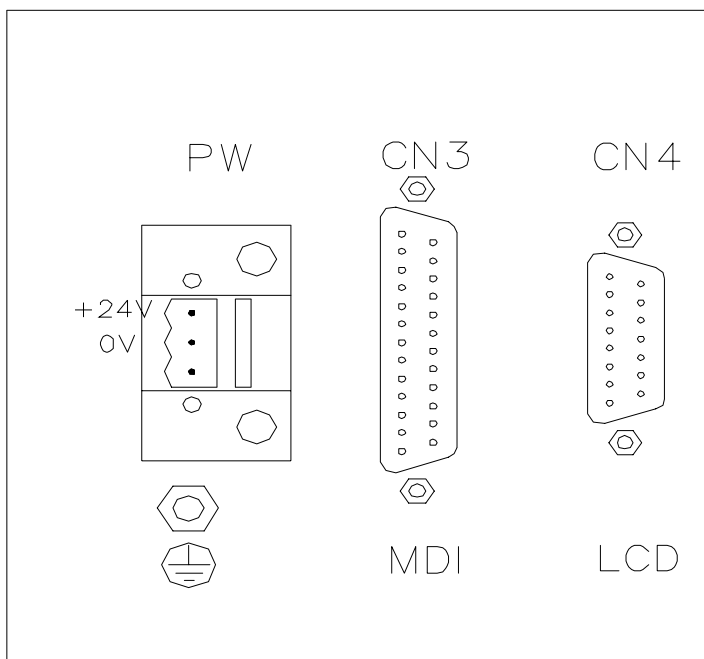
PRDY- is directly connected to 0V.

CV5 is used for spindle control or the 5th axis control.

4. Interface Layout of I/O Board



5. Interface Layout of MDI/LCD Panel

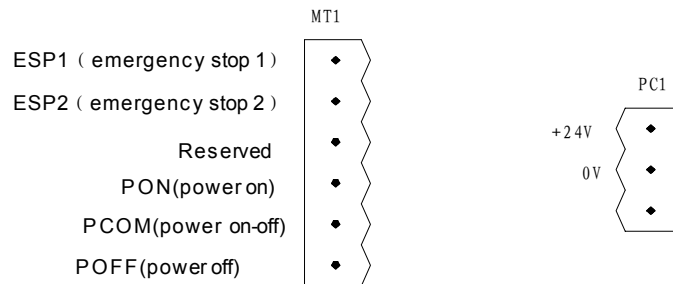
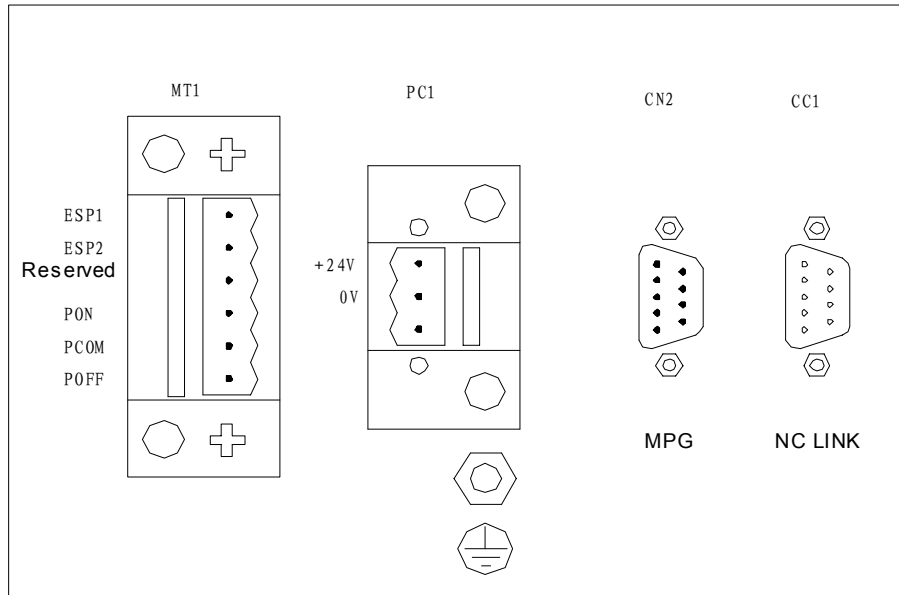


PW		CN3 (D-25 female)		
+24V	•	01	*SW00	SW00-07: Line scanning input signal of keyboard matrix
0V	•	02	*SW02	
	•	03	*SW04	
	•	04	*SW06	
	•	05	*CM00	CM00-07: Column scanning output signal of keyboard matrix
	•	06	*CM02	
	•	07	*CM04	
	•	08	*CM06	
	•	09	0V	
	•	10	0V	
	•	11	0V	
	•	12	0V	
	•	13	0V	
	•	14	*SW01	
	•	15	*SW03	
	•	16	*SW05	
	•	17	*SW07	
	•	18	*CM01	
	•	19	*CM03	
	•	20	*CM05	
	•	21	*CM07	
	•	22	0V	
	•	23	0V	
	•	24	0V	
	•	25	0V	

CN4 (D-15 female)		
01	SLH	09 *SLH
02	SLL	10 *SLL
03	ORH	11 *ORH
04	DG03	12 *DG03
05	DG02	13 *DG02
06	DG01	14 *DG01
07	DG00	15 *DG00
08	0V	

(LCD)

6. Interface Layout of Machine Operator panel



CN2 (D-9 male)		
01	+5V	06 HA
02	+5V	07 *HA
03	0V	08 HB
04	0V	09 *HB
05	0V	

HA,*HA: A phase difference of MPG
HB,*HB: B phase difference of MPG

(MPG)

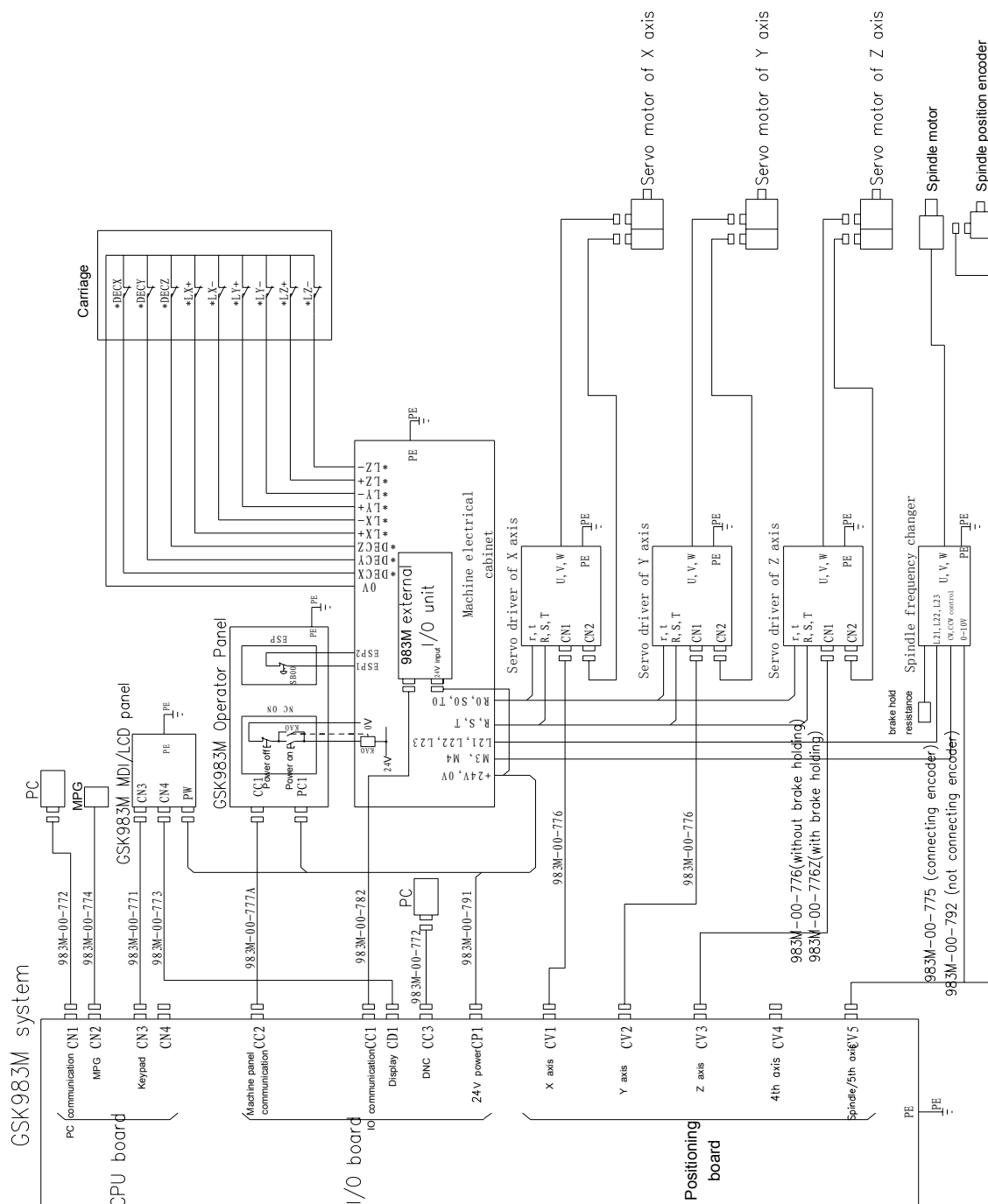
CC1 (D-9 female)		
01	RD+	06 RD-
02	*RXD	07
03	*TXD	08 TD-
04	TD+	09 0V
05	0V	

RD+ RD-: RS422 difference receiving terminal
TD+ TD-: RS422 difference transmitting terminal
*RXD: RS232 receiving terminal
*TXD: RS232 sending terminal

(NC LINK)

Note: The feet pattern of CN2 are used for internal handwheel.

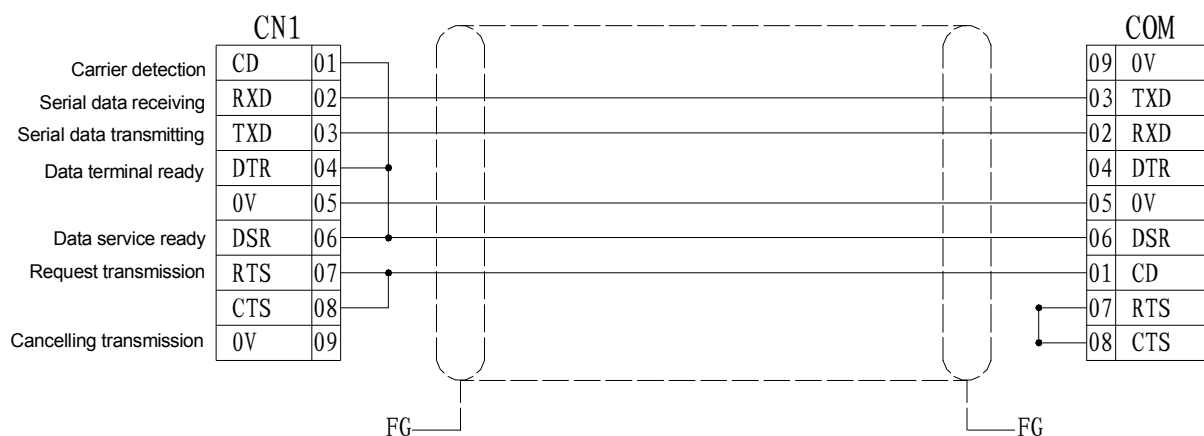
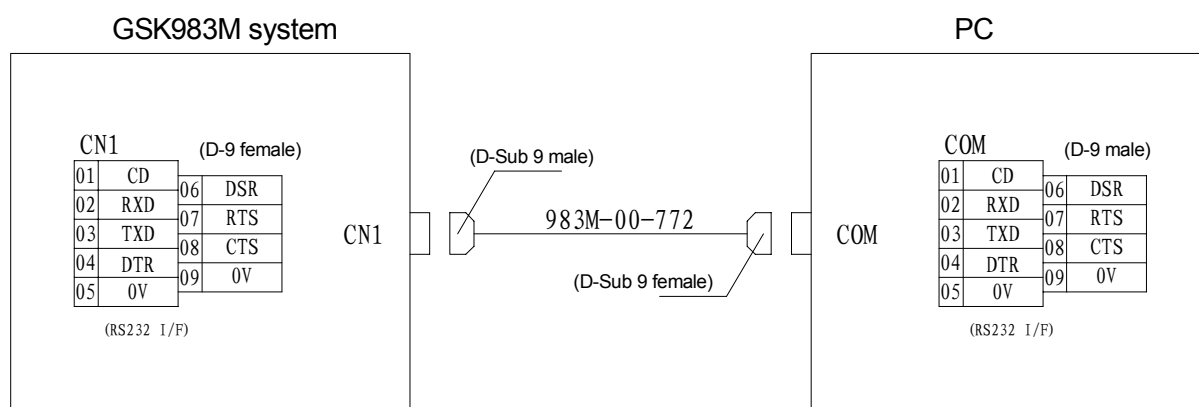
7. Connection Layout



Note:

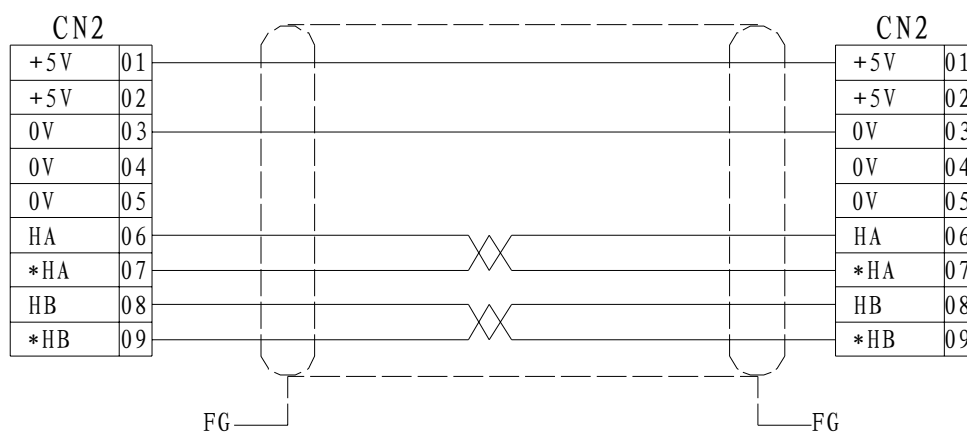
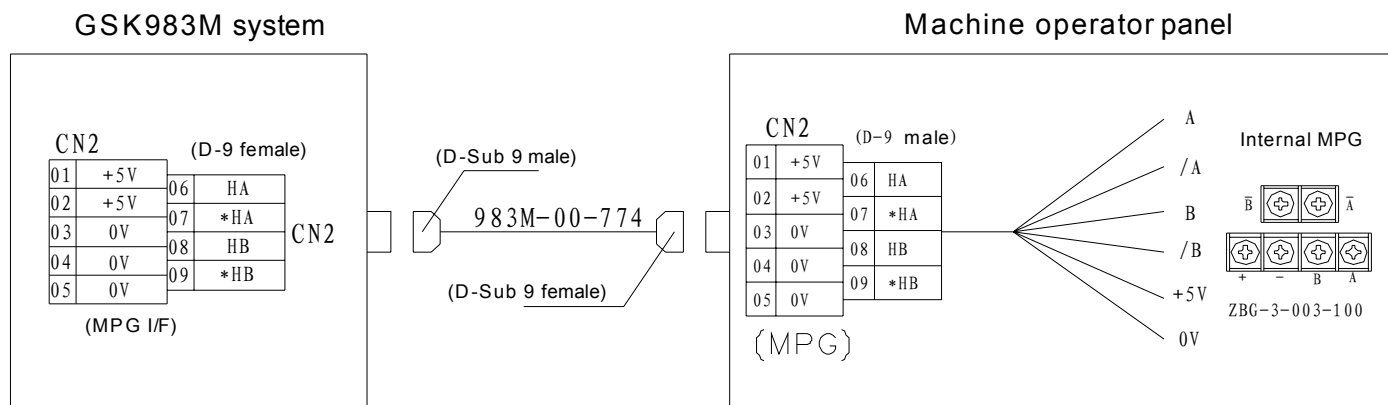
The system, MDI/LCD panel, operator panel, I/O unit and servo driver should be safely grounded.

8. Connection Cables for Communication with PC(RS232)



Note: The shell of NC and of PC should be safely grounded.

9. Connection Cables for MPG (Handwheel)



HA *HA: A phase difference signal of MPG

HB *HB: B phase difference signal of MPG

10. External MPG(Handwheel) Connection 1: Internal Connection of Operator panel

CM2 interface definition of control panel

CM2 Pin No.	Signal name	Signal function	I/O
01	HX1	Hand box override X1	I
02	HX2	Hand box override X10	I
03	HX3	Hand box override X100	I
04	HHX	(Axis selection of hand box) X axis	I
05	HHY	(Axis selection of hand box) Y axis	I
06	HHZ	(Axis selection of hand box) Z axis	I
07	HH4	(Axis selection of hand box) 4th axis	I
08			
09	0V		
10	0V		

Operator panel
Interface definition of
axis and override:

Pin No.	Signal name
01	HX1
06	HX2
02	HX3
07	HHX
03	HHY
08	HHZ
04	HH4
09	
05	0V

Control panel
CM2 (10p female)

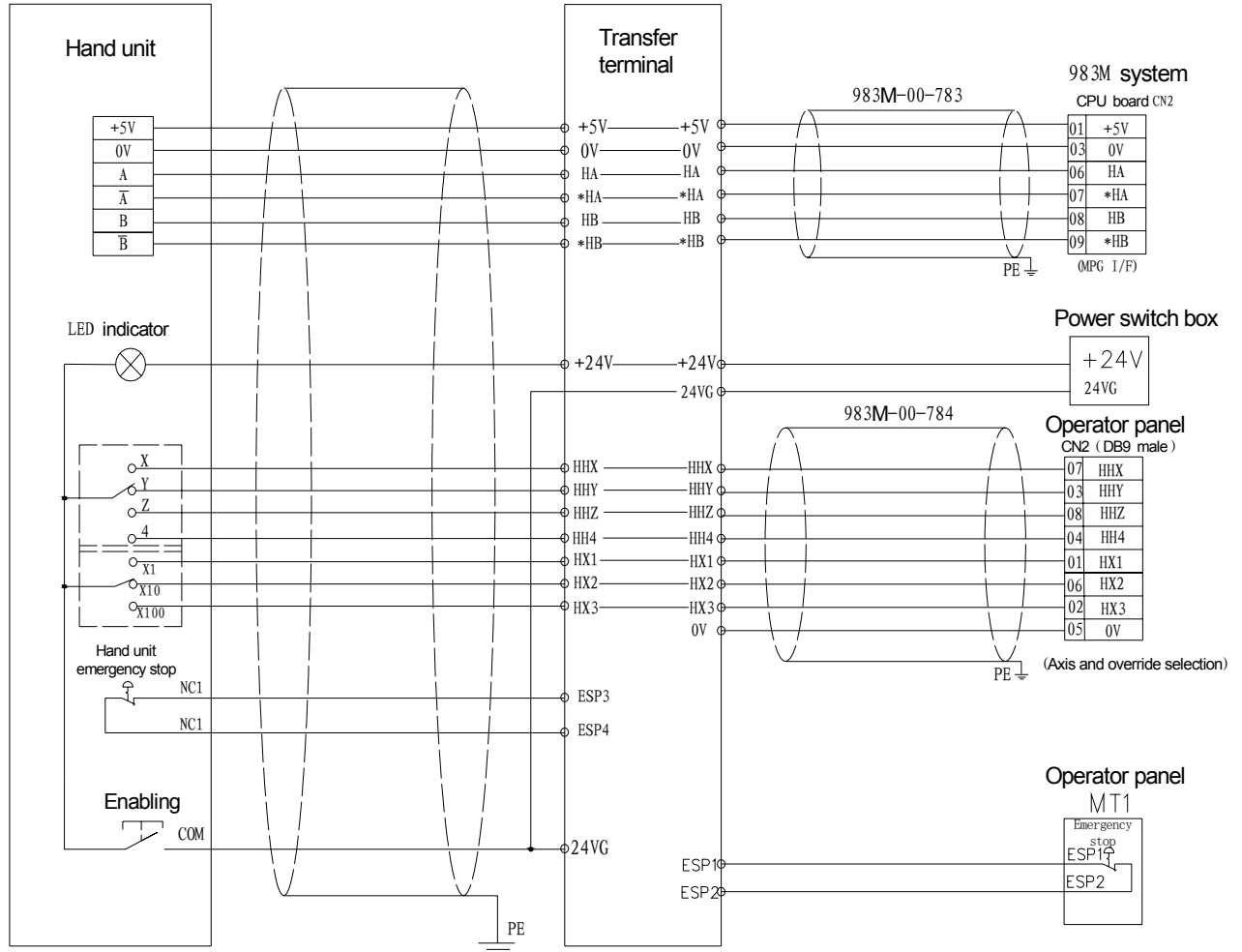
983M-00-706
(Colored winding displacement, L=200mm)

01	HX1
02	HX2
03	HX3
04	HHX
05	HHY
06	HHZ
07	HH4
08	Standby
09	0V
10	0V

Operator panel
(axis and override selection)
CN2 (DB9 male)

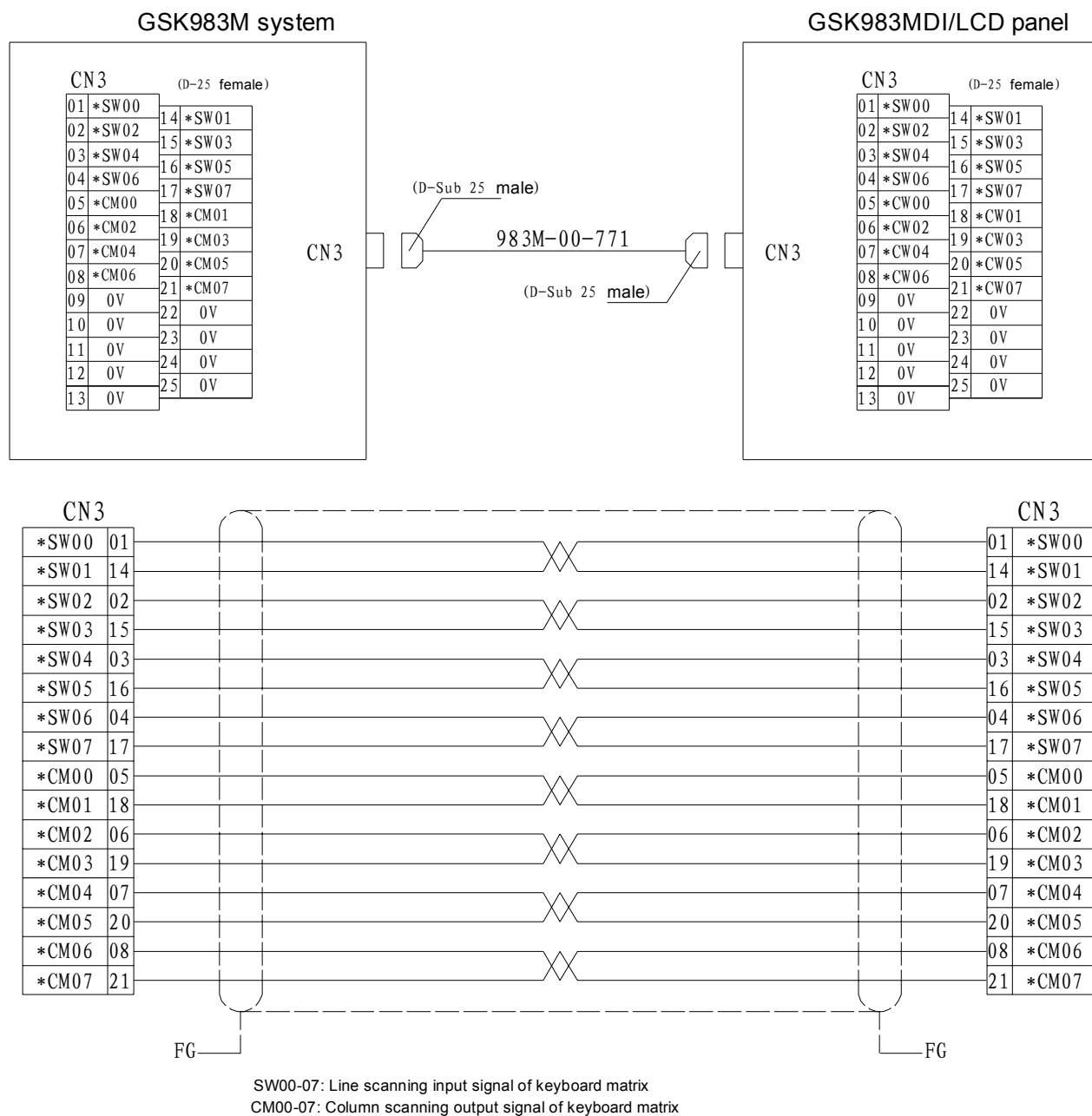
01	HX1
06	HX2
02	HX3
07	HHX
03	HHY
08	HHZ
04	HH4
09	Standby
05	0V

11. External MPG(Handwheel) Connection 2: external MPG connection

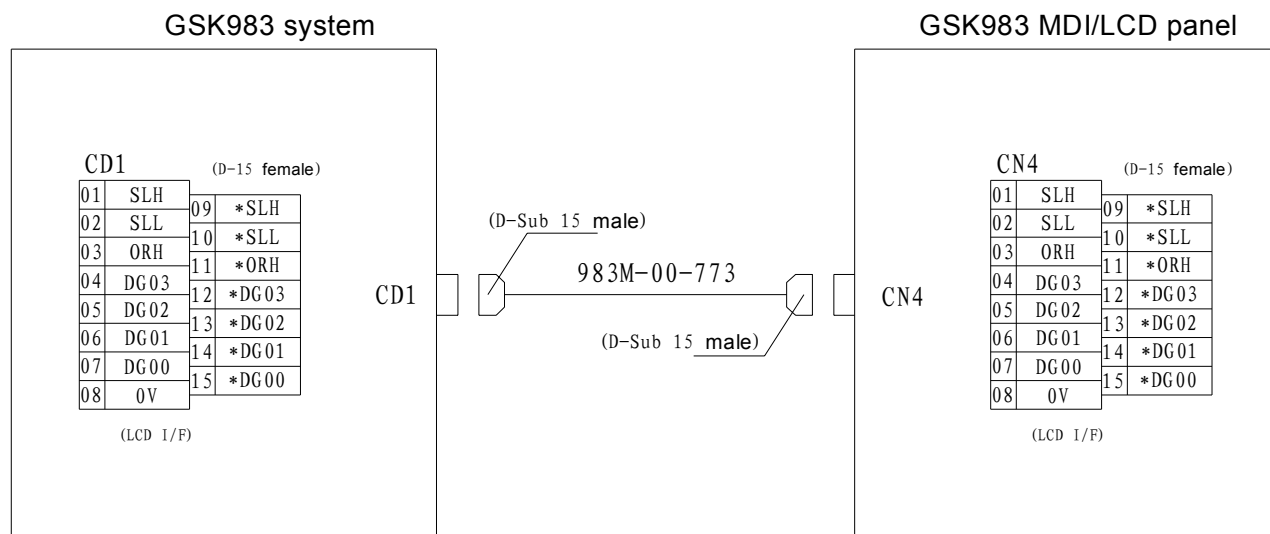


Note: The emergency stop of external MPG(handwheel) should be serially connected to the emergency link circuit, see it in "The connection diagram of emergency stop and brake hold of Z axis".

12 . Connection Cables for Keyboard

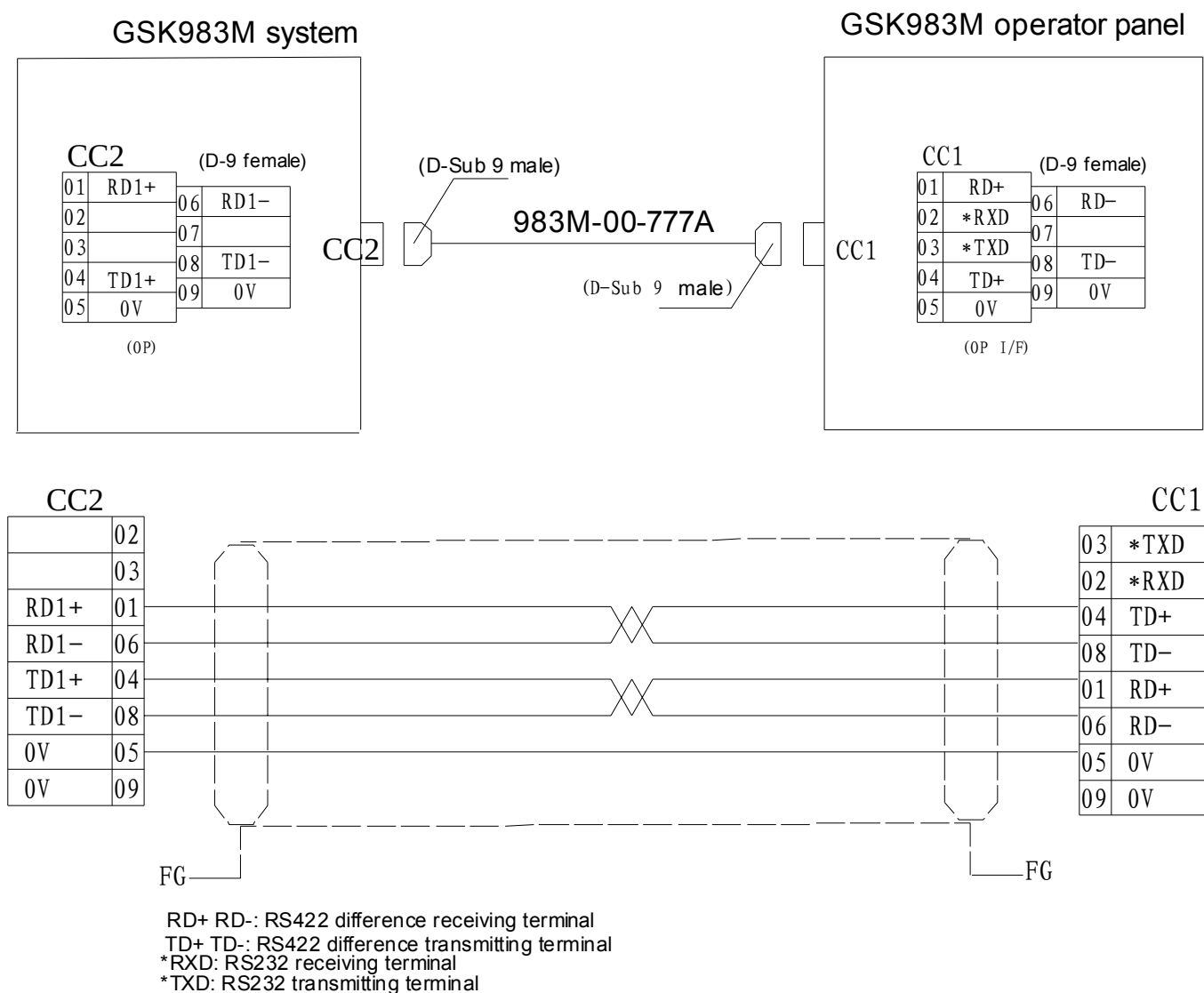


13. Connection Cables for Display

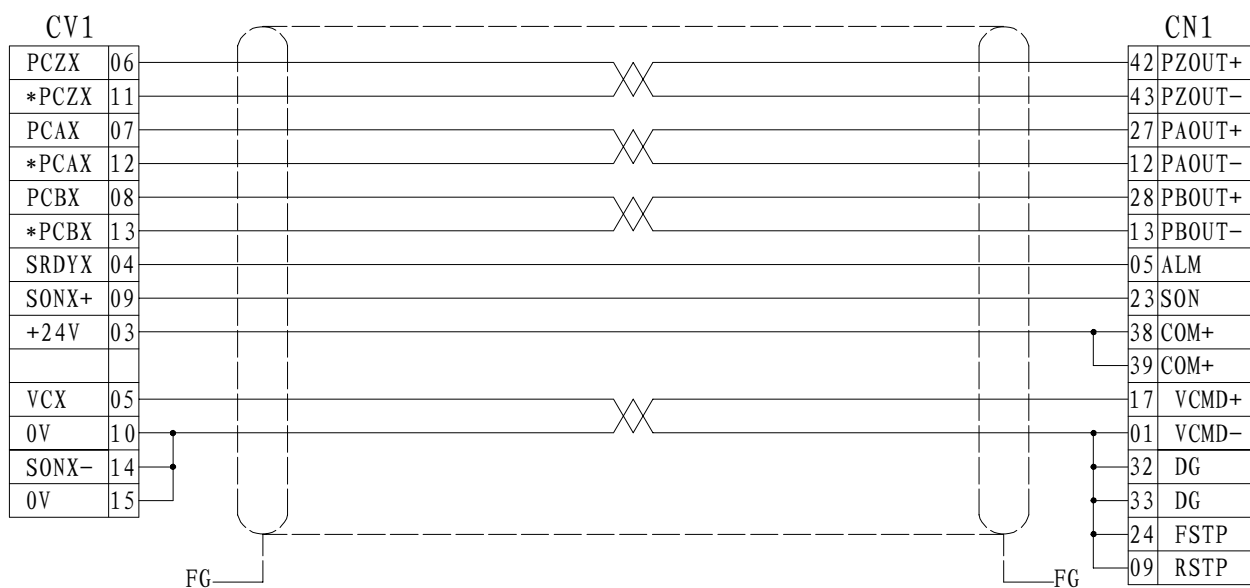
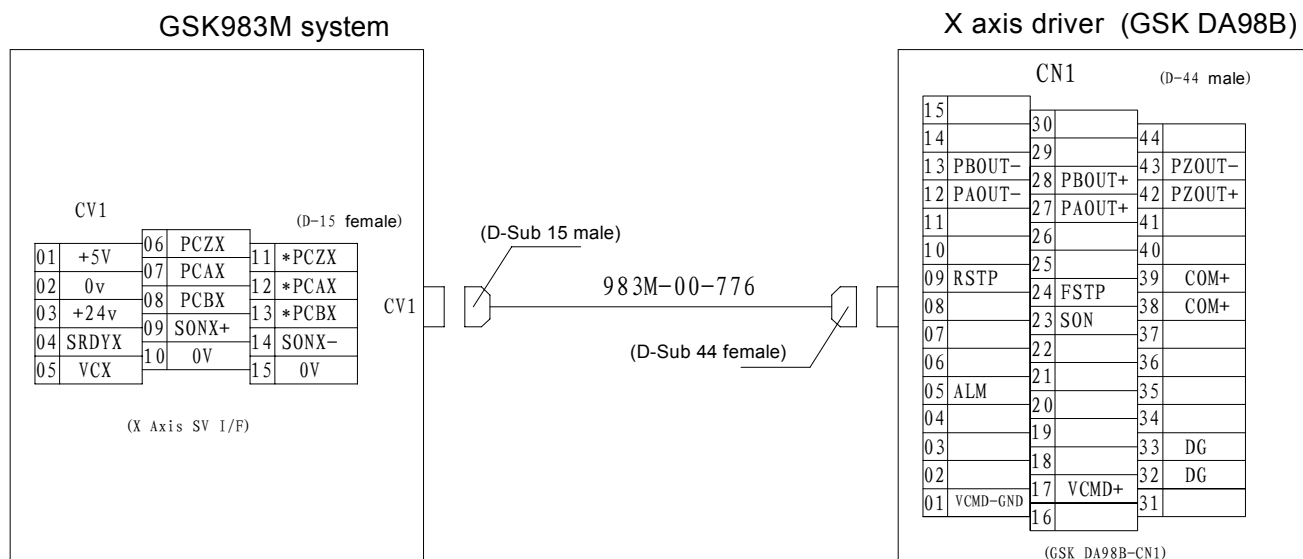


SLH *SLH: Reading signal of 4 digits to the left of the decimal point
 SLL *SLL: Reading signal of 4 digits to the right of the decimal point
 ORH *ORH: Data display ready signal
 DG00-03 *DG00-03: Data display signal

14. Communication Cable between Operator panel and System



15. Cables for Connecting DA98B Drive



PCA *PCA: A phase difference signal of encoder feedback (pulse signal, drive ↓ NC)

PCB *PCB: B phase difference signal of encoder feedback (pulse signal, drive ↓ NC)

PCZ *PCZ: Z phase difference signal of encoder feedback (pulse signal, drive ↓ NC)

SON+/-: Enabling signal (ON-OFF signal, NC ↓ drive)

ALM: Alarm signal (ON-OFF signal, drive ↓ NC)

VC: Speed control voltage(DC, NC ↓ drive)

Note 1: The "X" in PCAX, PCBX... stands for X axis, and Y for Y axis in PCAY, PCBY ...

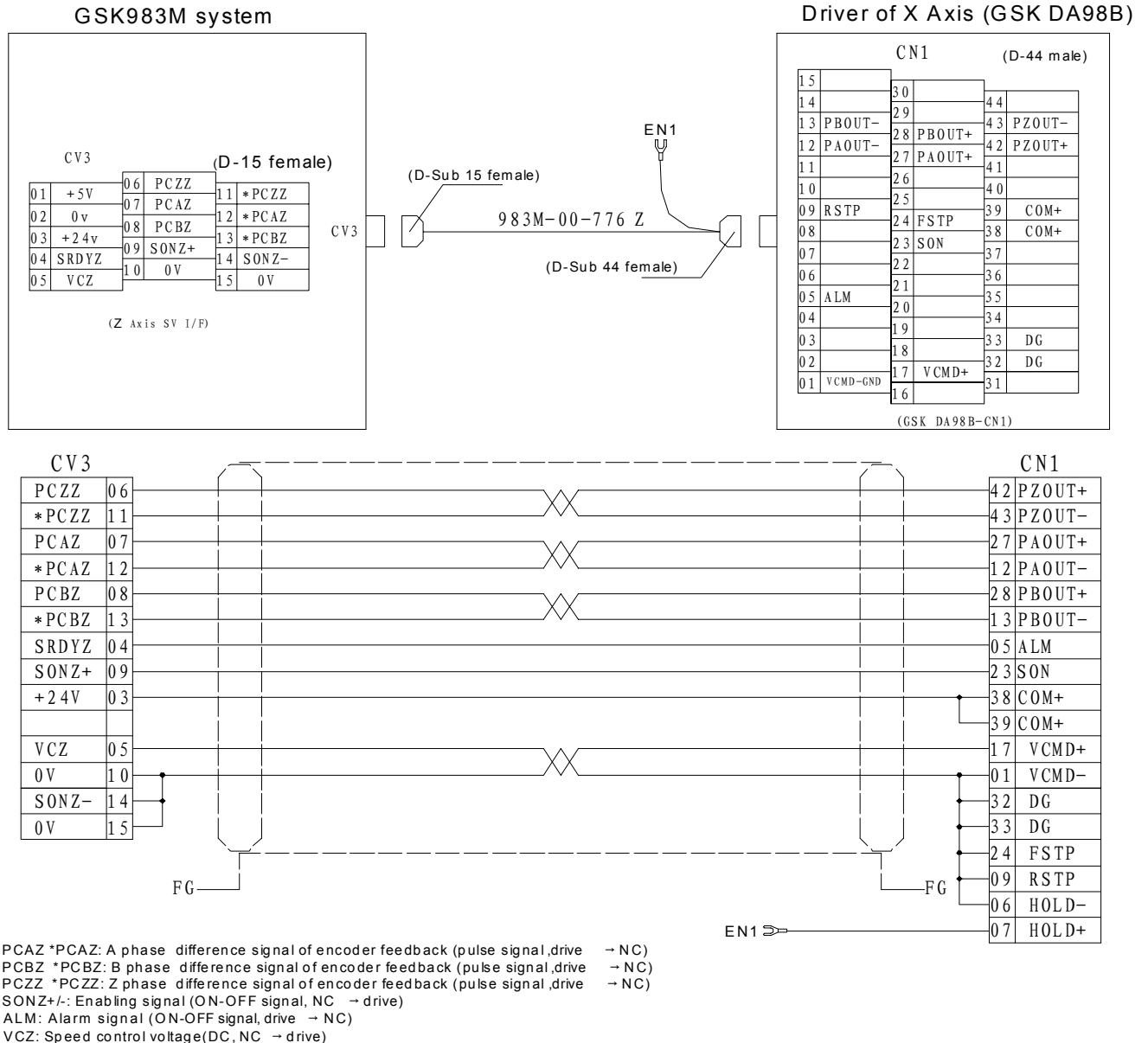
Note 2: The connecting cable of Y axis driver is the same that of X axis. And the connecting cable of Z axis without brake hold is also the same that of X axis. See the connection of Z axis with brake hold in the next page.

Note 3: As for this connection, set the parameter No.19 (version before V2.05) of DA98B to 1, the feed direction is positive while watching the counterclockwise rotation from the motor shaft. If the motion direction is reverse to Descartes coordinate system, set the parameter No.19 of driver to a reverse value, and exchange the two wires of PAOUT+/PAOUT- by that of PBOUT+/PBOUT- respectively. (The parameter No.19 of DA98B is matched with the A, B phase feedback signals of encoder. And its delivery setting is 1.

The rotation direction of motor can be modified by parameters as for versions after V2.05.

Note 4: When matching with DA98D-1, the wiring of it is the same that of DA98B, by this means the rotation direction of the motor complies to the Descartes coordinate system(the feeding is positive direction while watching counterclockwise rotation from the motor shaft). If counterclockwise rotation is required, set the parameter PA46 of DA98D-1 to 3 (the default is "0").

16. Z Axis Connecting Holding Cable of DA98B Drive



Note 1: As for this connection, set the parameter No.19 (version before V2.05) of DA98B to 1, the feeding direction is the positive while watching the counterclockwise rotation from the motor shaft. If the motion direction is reverse to Descartes coordinate system, set the parameter No.19 of driver for a reverse value, and exchange the two wires of PAOUT+/PAOUT- by that of PBOUT+/PBOUT- respectively. (The parameter No.19 of DA98B is matched with the A, B phase feedback signals of encoder. And its delivery setting is 1.
 The rotation direction of motor can be modified by parameters as for versions after V2.05.
 Note 2 When matching with DA98D-1, the wiring of it is the same that of DA98B, by this means the rotation direction of the motor complies to the Descartes coordinate system (the feeding is positive while watching the counterclockwise rotation from the motor shaft). If counterclockwise rotation is required, set the parameter PA46 of DA98D-1 to 3 (the default value is "0").

17. Cables for Spindle Frequency Changer

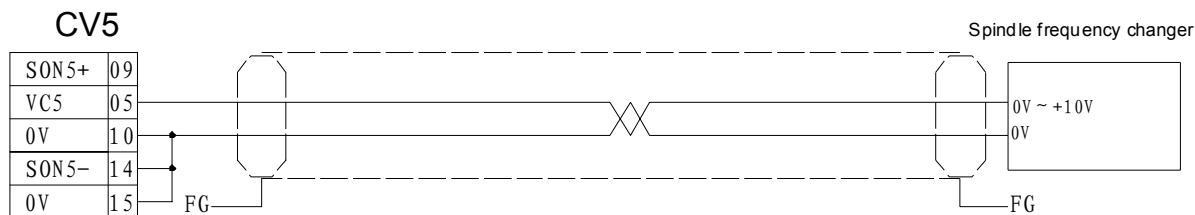
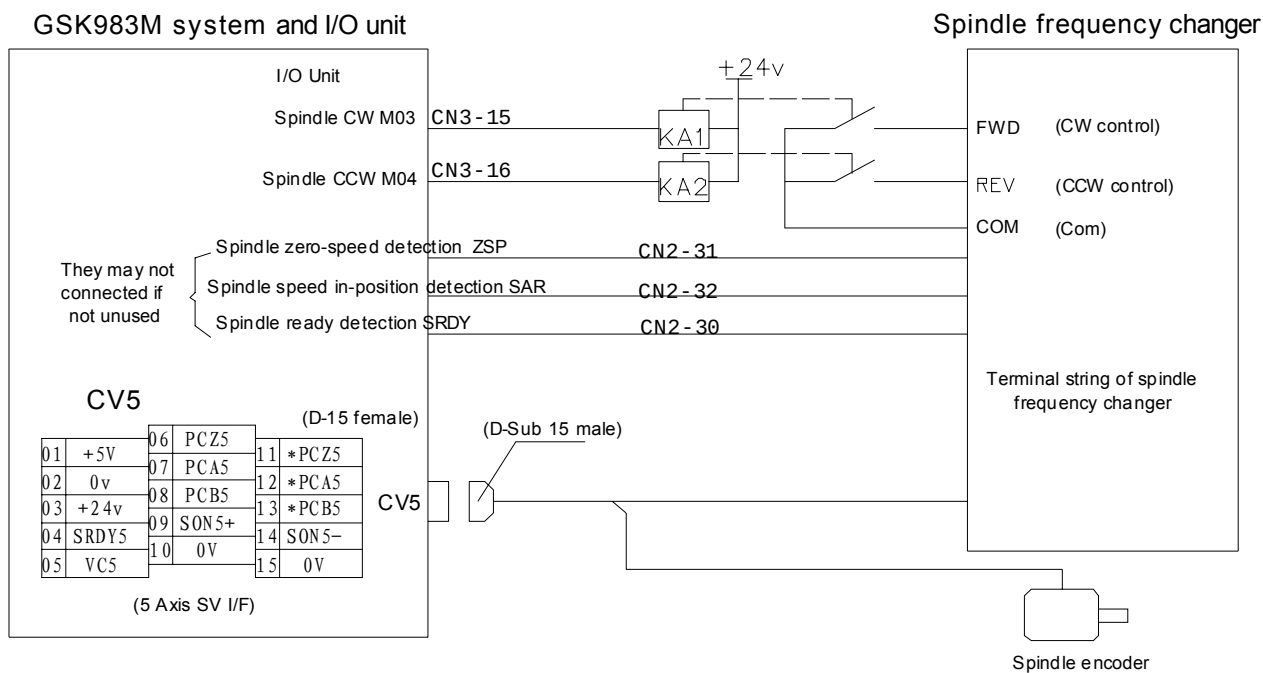


Fig.1:Wiring without spindle encoder (983M-00-792)

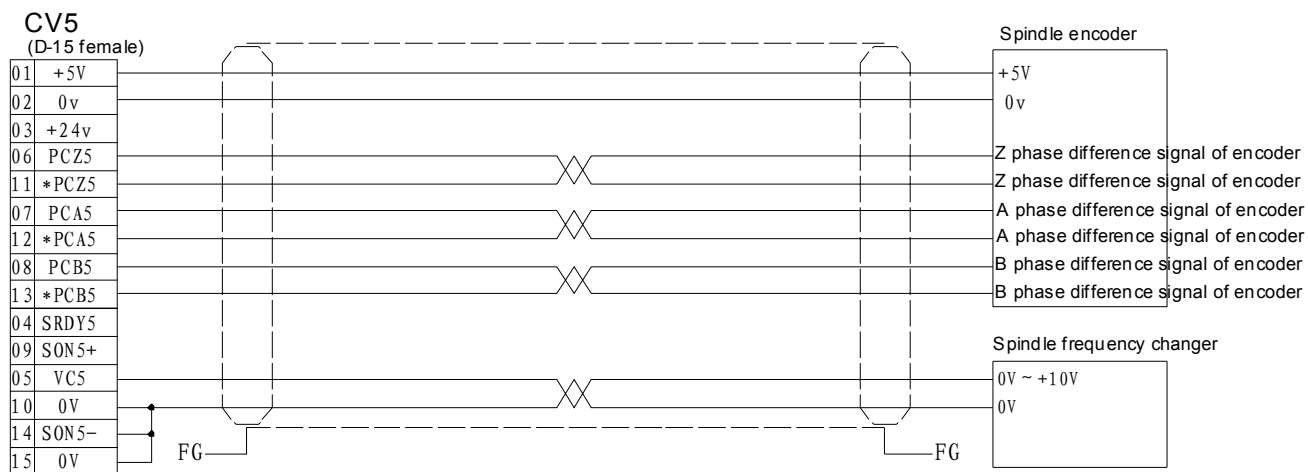
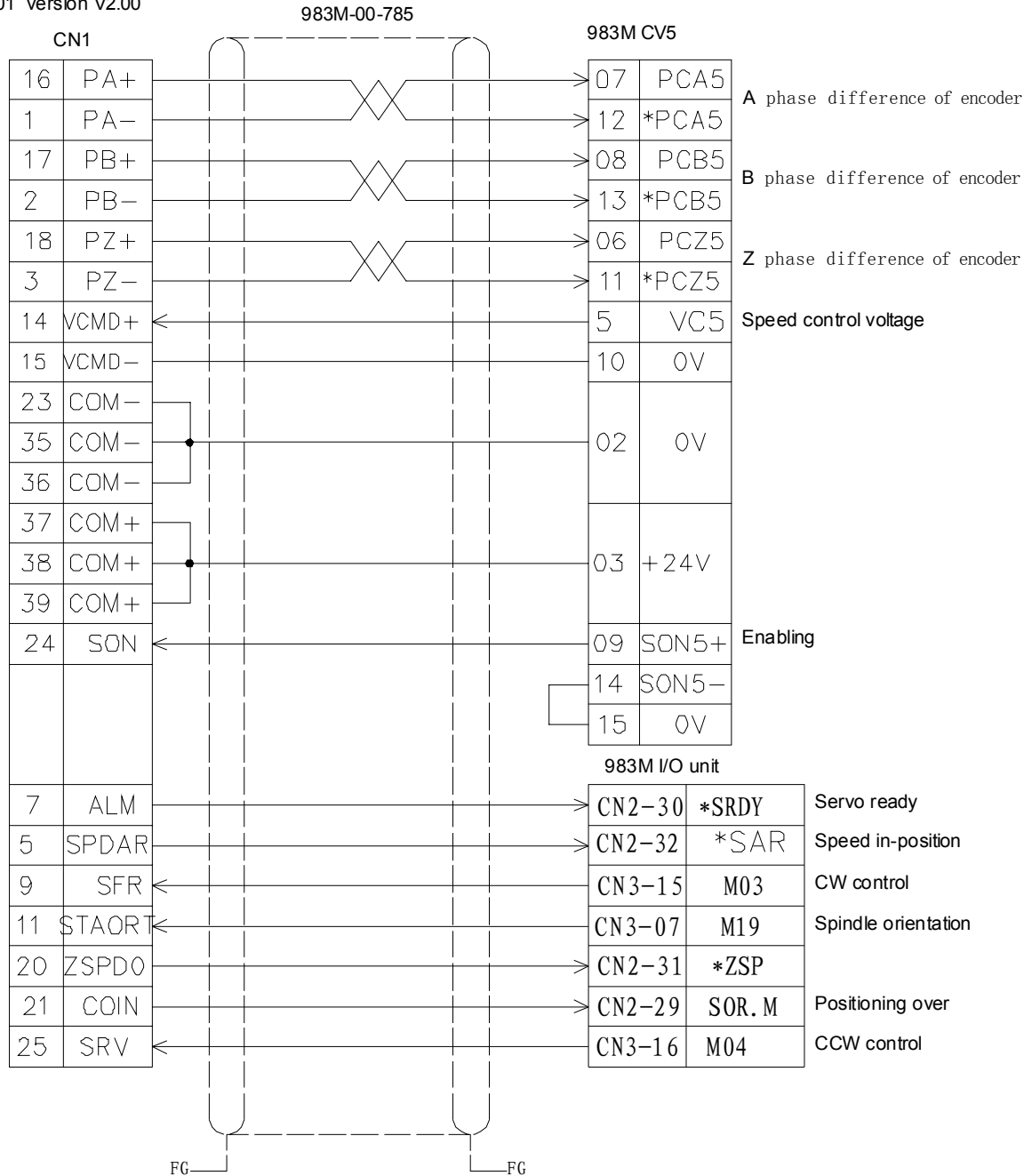


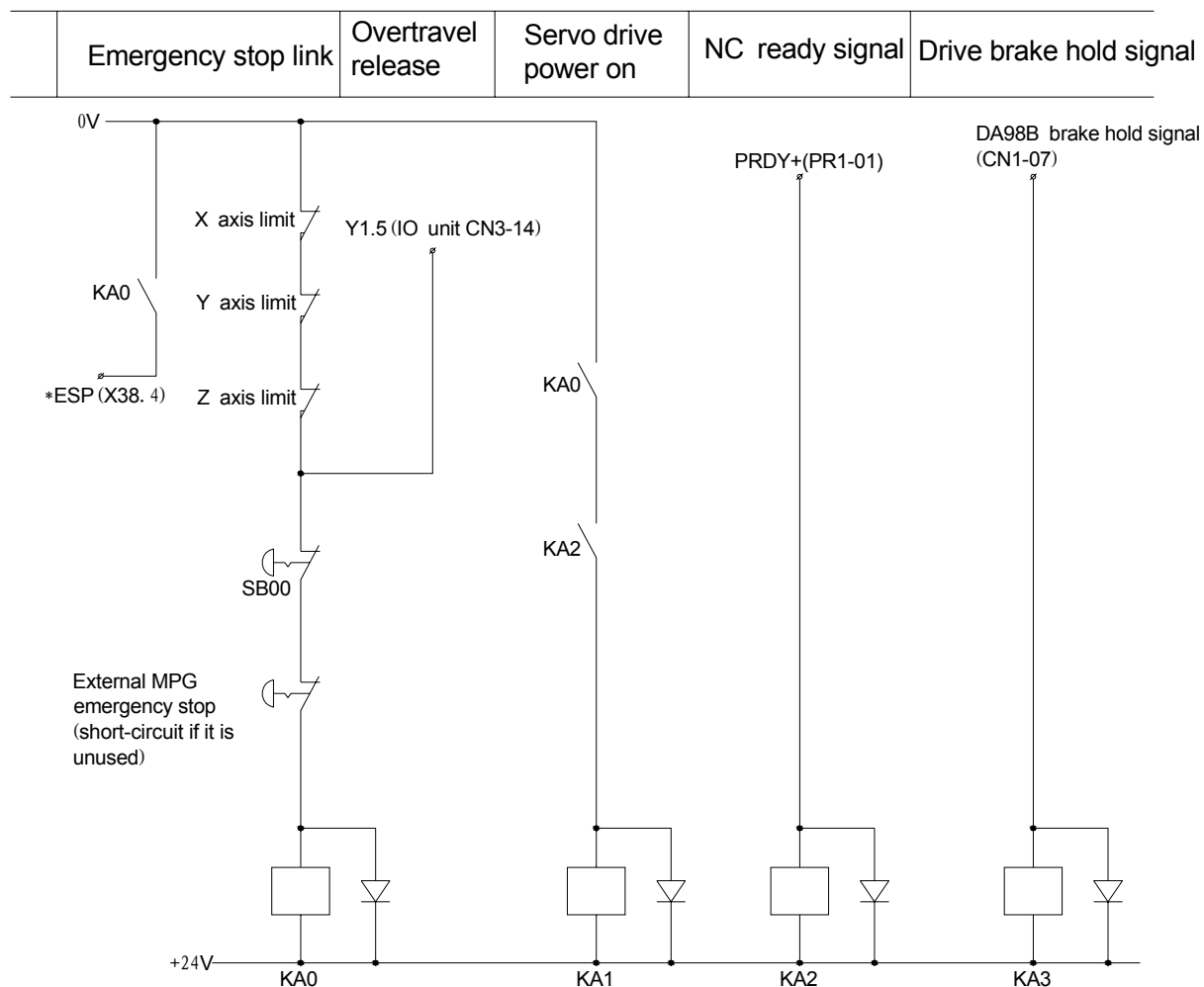
Fig.2:Wiring with spindle encoder (983M-00-775)

18. Cables for Connecting DAP01 Servo Spindle

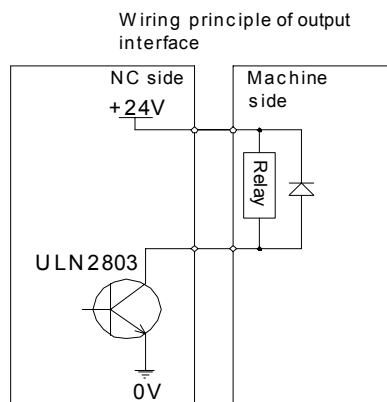
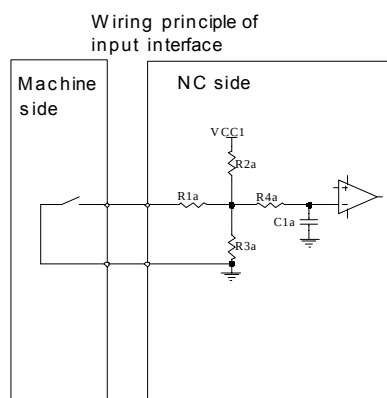
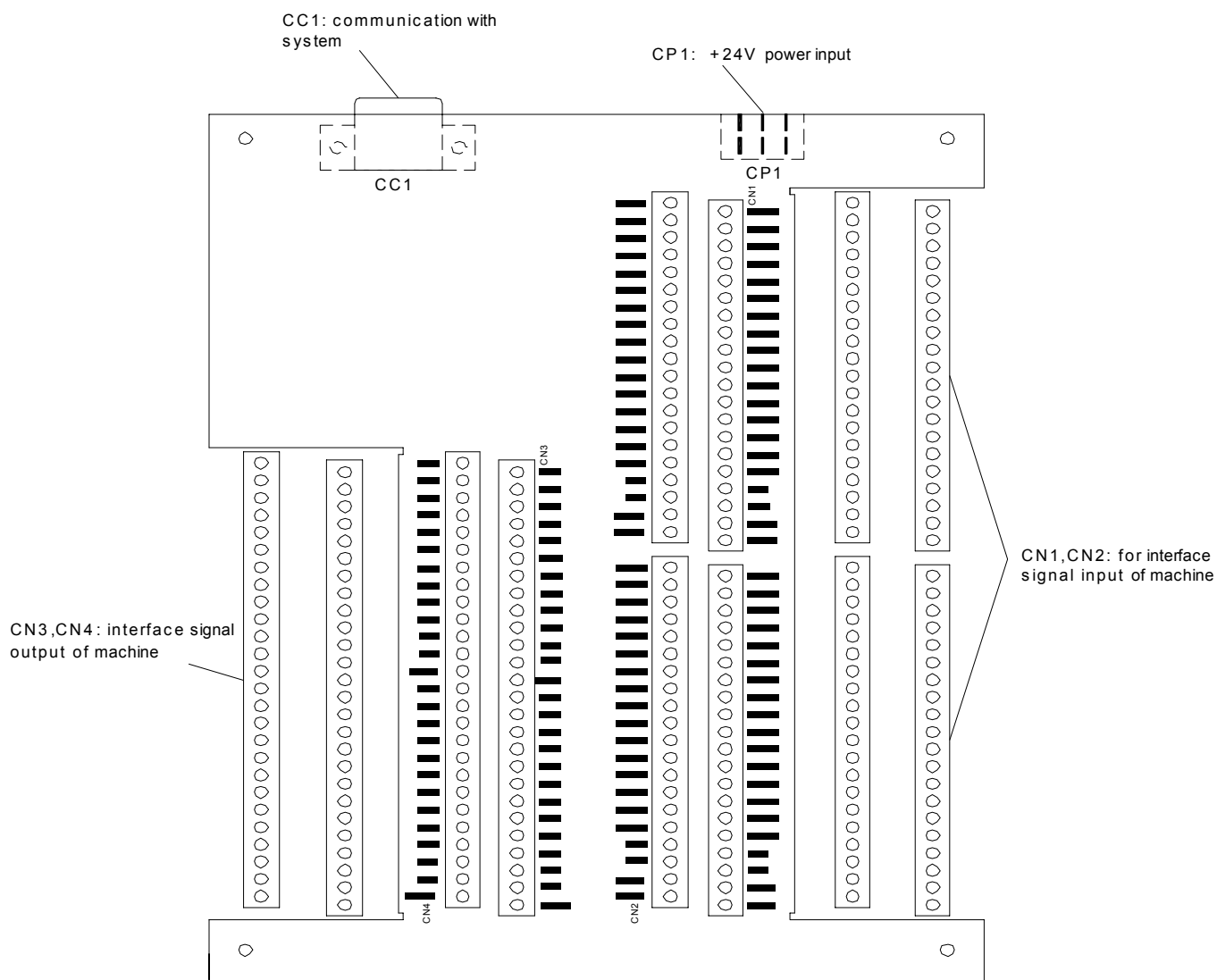
DAP01 version V2.00



19. Connection Diagram of Machine Emergency Stop and Holding Brake

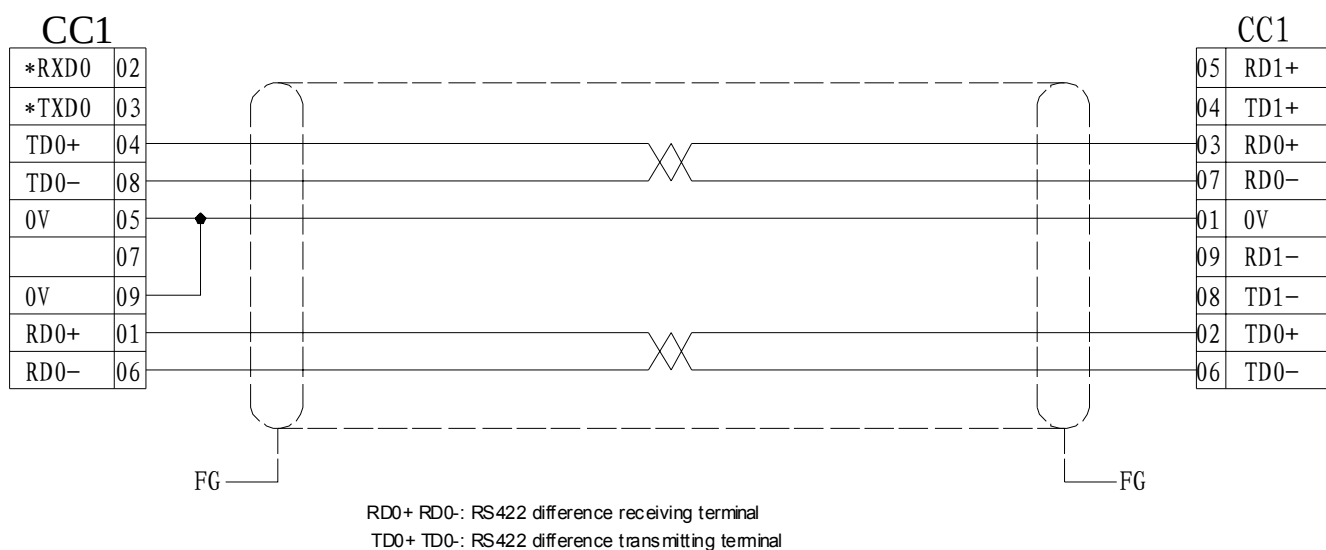
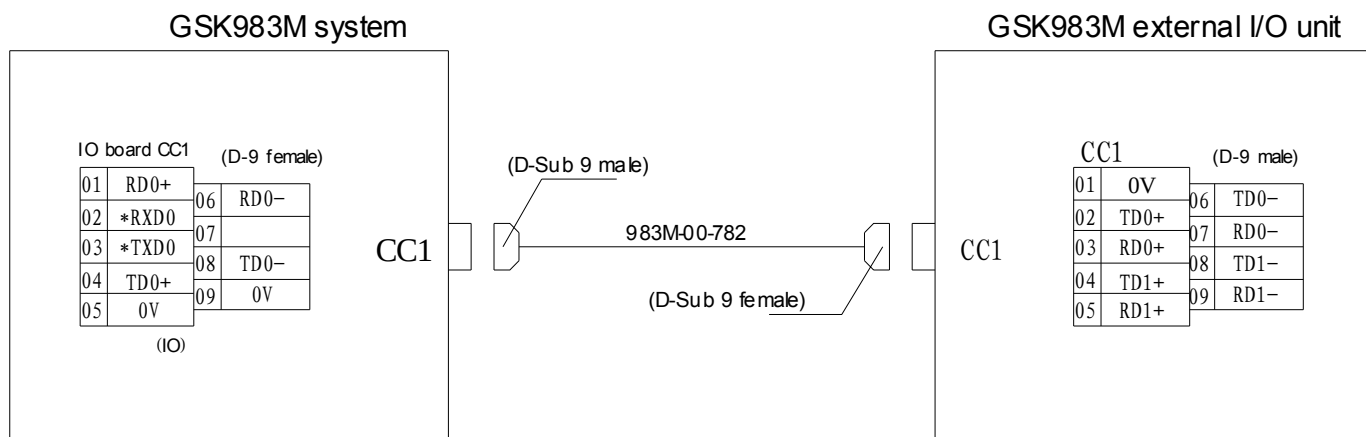


20. External I/O Unit



Note:
The low level of delivery setting of input interface is valid;
and that of output interface is Darlington array ULN2803.

21. Communication Connection Cables for External I/O Unit and System



22. Definition for I/O input/output point

CN1 pin No. input	PMC address	Signal name	I/O	CN2 pin No. input	PMC address	Signal name	I/O
1	32.0	*X+ limit	I	1	48.0		I
2	32.1	*X- limit	I	2	48.1		I
3	32.2		I	3	48.2		I
4	32.3		I	4	48.3		I
5	32.4		I	5	48.4		I
6	32.5	*X machine zero return deceleration	I	6	48.5		I
7	32.6		I	7	48.6		I
8	32.7		I	8	48.7		I
9	33.0	*Y+ limit	I	9	49.0		I
10	33.1	*Y- limit	I	10	49.1		I
11	33.2		I	11	49.2		I
12	33.3		I	12	49.3		I
13	33.4		I	13	49.4		I
14	33.5	*Y machine zero return deceleration	I	14	49.5		I
15	33.6		I	15	49.6		I
16	33.7		I	16	49.7		I
17	34.0	*Z+ limit	I	17	35.0	*+L4limit	I
18	34.1	*Z- limit	I	18	35.1	*-L4 limit	I
19	34.2		I	19	35.2		I
20	34.3		I	20	35.3		I
21	34.4		I	21	35.4		I
22	34.5	*Z machine zero return deceleration	I	22	35.5	*DEC4 machine zero return deceleration	I
23	34.6		I	23	35.6		I
24	34.7		I	24	35.7		I
25	38.0		I	25	39.0		I
26	38.1		I	26	39.1		I
27	38.2		I	27	39.2		I
28	38.3		I	28	39.3		I
29	38.4	*Emergency stop input	I	29	39.4		I
30	38.5		I	30	39.5		I
31	38.6		I	31	39.6		I
32	38.7		I	32	39.7		I
33		0V		33		0V	
34		0V		34		0V	
35		0V		35		0V	
36		0V		36		0V	

37		24V			37		24V	
38		24V			38		24V	
39		24V			39		24V	
40		24V			40		24V	

CN3 pin No. output	PMC address	Signal definition	I/O		CN4 pin No. output	PMC address	Signal definition	I/O
1	0.0				1	3.0		
2	0.1				2	3.1		
3	0.2				3	3.2		
4	0.3				4	3.3		
5	0.4				5	3.4		
6	0.5				6	3.5		
7	0.6				7	3.6		
8	0.7				8	3.7		
9	1.0				9	4.0		
10	1.1				10	4.1		
11	1.2				11	4.2		
12	1.3				12	4.3		
13	1.4				13	4.4		
14	1.5				14	4.5		
15	1.6				15	4.6		
16	1.7				16	4.7		
17	2.0				17	2.4		
18	2.1				18	2.5		
19	2.2				19	2.6		
20	2.3				20	2.7		
21		0V			21		0V	
22		0V			22		0V	
23		0V			23		0V	
24		0V			24		0V	
25		24V			25		24V	
26		24V			26		24V	

Note: The unmarked signals for CN1~CN4 is defined by PMC and also programming. The marked signals can't be changed.

Appendix 1 M6302 Instruction of PMC Version

1. Functions of M6302

- Spindle function: M03 (spindle CW); M04 (spindle CCW); M05 (spindle stop)
M19 (spindle orientation)
Spindle shifting gears: M41 (command gear 1); M42 (command gear 2)
(spindle B) M43 (command gear 3); M44 (command gear 4)
- Cooling function: M08 (cooling ON); M09 (cooling OFF)
- tool releasing and clamping function: M21 tool releasing; M22 tool clamping
- Toolpost forward and backward : M23 toolpost forward; M24 toolpost backward
- Tool selection: T 1 ~ T 1 6 is used for instructing tool number required and rotating the tool plate to the corresponding position
- Automatic machine zero returning: The automatic zero returning of the respective axis is set by the corresponding PC parameter
- Hand box: use it by CM2 interface

2. I/O interface setting of M6302

CN1 pin No. (diagnosis) input	Signal explanation	CN2 pin No. (diagnosis) input	Signal explanation
1 (32.0)	*X+ limit (fixed)	1(48.0)	
2 (32.1)	*X- limit (fixed)	2(48.1)	
3 (32.2)	* universal alarm 1	3(48.2)	
4 (32.3)	* universal alarm 2	4(48.3)	
5 (32.4)	* universal alarm 3	5(48.4)	
6 (32.5)	*X machine zero return deceleration (fixed)	6(48.5)	
7 (32.6)	* universal alarm 4	7(48.6)	
8 (32.7)	* universal alarm 5	8(48.7)	
9 (33.0)	*Y+ limit (fixed)	9(49.0)	
10 (33.1)	*Y- limit (fixed)	10(49.1)	
11 (33.2)	* universal alarm 6	11(49.2)	
12 (33.3)	* universal alarm 7	12(49.3)	
13 (33.4)	* universal alarm 8	13(49.4)	
14 (33.5)	*Y machine zero return deceleration (fixed)	14(49.5)	
15 (33.6)	Tool number counting	15(49.6)	
16 (33.7)	Toolpost zero	16(49.7)	
17 (34.0)	*Z+ limit (fixed)	17 (35.0)	*+L4 limit (fixed)
18 (34.1)	*Z- limit (fixed)	18 (35.1)	*-L4 limit (fixed)
19 (34.2)		19 (35.2)	
20 (34.3)		20 (35.3)	
21 (34.4)		21 (35.4)	
22 (34.5)	*Z machine zero return deceleration (fixed)	22 (35.5)	*DEC4 machine zero return deceleration (fixed)
23 (34.6)	Toolpost forward (in-position detection)	23 (35.6)	
24 (34.7)	Toolpost backward (in-position detection)	24 (35.7)	
25(38.0)	Gear 1 of spindle (in-position detection)	25(39.0)	
26(38.1)	Gear 2 of spindle (in-position detection)	26(39.1)	
27(38.2)	Gear 3 of spindle (in-position detection)	27(39.2)	
28(38.3)	Gear 4 of spindle (in-position detection)	28(39.3)	In-position detection of spindle orientation releasing
29(38.4)	*Emergency stop (fixed)	29(39.4)	In-position detection of spindle orientation
30(38.5)	Tool releasing (in-position detection)	30(39.5)	Spindle ready
31(38.6)	Tool clamping (in-position detection)	31(39.6)	Zero-speed detection of spindle
32(38.7)	Buttons of tool releasing or clamping	32(39.7)	In-position detection of spindle speed
33	0V	33	0V
34	0V	34	0V
35	0V	35	0V
36	0V	36	0V
37	24V	37	24V
38	24V	38	24V
39	24V	39	24V
40	24V	40	24V

CN3 pin No. (diagnosis) output	Signal explanation	CN4 pin No. (diagnosis) output	Signal explanation
1(0.0)	Gear 1 of spindle M41 (output instruction)	1(3.0)	
2(0.1)	Gear 2 of spindle M42 (output instruction)	2(3.1)	
3(0.2)	Gear 3 of spindle M43 (output instruction)	3(3.2)	
4(0.3)	Gear 4 of spindle M44 (output instruction)	4(3.3)	
5(0.4)	Toolpost forward M23 (output instruction)	5(3.4)	
6(0.5)	Toolpost backward M24 (output instruction)	6(3.5)	
7(0.6)	Spindle orientation M19 (output instruction)	7(3.6)	
8(0.7)	Tool releasing/clamping M21/M22 (output instruction)	8(3.7)	
9(1.0)	Toolpost forward rotation (output instruction)	9(4.0)	
10(1.1)	Toolpost backward rotation (output instruction)	10(4.1)	
11(1.2)	Spindle brake (mechanical)	11(4.2)	
12(1.3)	Cooling ON M8	12(4.3)	
13(1.4)	Lubricating ON	13(4.4)	
14(1.5)	Overtravel releasing	14(4.5)	
15(1.6)	Spindle CW M3 (output instruction)	15(4.6)	
16(1.7)	Spindle CCW M4 (output instruction)	16(4.7)	
17(2.0)	RED.ALL	17(2.4)	
18(2.1)	YEL.ALL	18(2.5)	
19(2.2)	GRE.ALL	19(2.6)	
20(2.3)		20(2.7)	
21	0V	21	0V
22	0V	22	0V
23	0V	23	0V
24	0V	24	0V
25	24V	25	24V
26	24V	26	24V

CM2 pin No.	PLC address	Signal name	Signal function	I/O
1	53.0	HX1	Hand box override X 1	I
2	53.1	HX2	Hand box override X 1 0	I
3	53.2	HX3	Hand box override X 1 0 0	I
4	53.3	HHX	(Axis selection of Hand box) X axis	I
5	53.4	HHY	(Axis selection of Hand box) Y axis	I
6	53.5	HHZ	(Axis selection of Hand box) Z axis	I
7	53.6	HH4	(Axis selection of Hand box) the 4 th axis	I
8				I
9	0V	0V	+	
10	0V	0V		

CM3 pin No.	PLC address	Signal name	Signal function	I/O
8	53.7	KEY	Program lock	I

9	0V	0V		
10	0V	0V		

- Note: 1 Except the signal remarked with “(fixed)” which has been defined by NC system(they can’t be defined by user), the other I/O interfaces can be defined through PMC by user. The above-mentioned I/O definitions are one of simple PMC I/O definitions to be convenient to user for the NC application group of GSK983M which can meet the requirements of some users to the machine I/O control.
- Note: 2 Logic of input interface can be set by the jumper wire (S1, S2, S3, S4, S5, S6, S7, S8) in I/O unit (for high level or low level).
 32.0-32.7 is defined by S1, 33.0-33.7 is defined by S2;
 34.0-34.7 is defined by S3, 35.0-35.7 is defined by S4;
 38.0-38.7 is defined by S5, 39.0-39.7 is defined by S6;
 48.0-48.7 is defined by S7, 49.0-49.7 is defined by S8;

The factory setting of input interface logic is low level; (PMC logic should be changed when the high level or low level is switched).

3. PMC parameter of M6302

PC parameter	Content
1001	Lubricating interval
1002	Starting time of lubricating pump
2001	Total tool numbers
2101	Current tool number

PC parameter 3001 (DGN: 6 0 0 #)		
Bit 0	Manual absolute enabling	
Bit 1	Detection shield for speed in-position	Set to 1: invalid detecting; set to 0: valid detecting。 (no zero-speed detection in M6302.PMC)
Bit 2	Detection shield for zero speed	
Bit 3	tool clamping detection being valid	Set to 1 for detecting the signal input Set to 0 for no detecting
Bit 4	tool releasing detection being valid	
Bit 5	Orientation type: 1 for mechanical orientation , 0 for electronic orientation	
Bit 6	Unused	
Bit 7	Unused	

PC parameter 3002 (DGN: 6 0 1 #)	
Bit 0	Automatic machine zero return
Bit 1	Machine zero return in X positive direction
Bit 2	Machine zero return in Y positive direction
Bit 3	Machine zero return in Z positive direction
Bit 4	Unused
Bit 5	Unused
Bit 6	Unused
Bit 7	Unused

PC parameter 3003 (DGN: 6 0 2 #)	
Bit 0	1 [#] user customizing universal alarm enabling
Bit 1	2 [#] user customizing universal alarm enabling
Bit 2	3 [#] user customizing universal alarm enabling
Bit 3	4 [#] user customizing universal alarm enabling
Bit 4	5 [#] user customizing universal alarm enabling
Bit 5	6 [#] user customizing universal alarm enabling
Bit 6	7 [#] user customizing universal alarm enabling
Bit 7	8 [#] user customizing universal alarm enabling

Universal alarm enabling:
Set to 0: the corresponding alarm input point is invalid.
Set to 1:the alarm occurs if the corresponding alarm input is broken down (the setting will be 0) .
Alarm is displayed at the corresponding bit of the diagnosis number 200#

Bit	7	6	5	4	3	2	1	0
Alarm	8#	7#	6#	5#	4#	3#	2#	1#

PC parameter 3004 (DGN: 6 0 3 #)

Bit 0	1 # user customizing universal alarm off	Universal alarm OFF: Set to 1, NC stops if the corresponding alarm occurs; Set to 0 (no setting), NC continues but MC if relative alarm occurring, while there is a indication and the MT alarm indicator ON.
Bit 1	2 # user customizing universal alarm off	
Bit 2	3 # user customizing universal alarm off	
Bit 3	4 # user customizing universal alarm off	
Bit 4	5 # user customizing universal alarm off	
Bit 5	6 # user customizing universal alarm off	
Bit 6	7 # user customizing universal alarm off	
Bit 7	8 # user customizing universal alarm off	

4. PMC version:

The version of PMC program is described by the address 219 of PMC (DGN#219) as follows:

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
PMC code name		System code name		PMC version number			
Explanation: ① PMC code name denotes the PMC specification of 983 configuration: Its significance: 00: matching external PLC 01: matching with GSK-PCA (imbedded) 10: matching with GSK-PCB (imbedded) 11: matching with GSK-PCC (imbedded) ② The system code name denotes the configuration of the machine(system) and the corresponding NC functional setting. Its concrete significance is as follows: 00: matching (two axes) turning machine 01: matching (three axes) milling machine 10: matching (four axes) machining center 11: matching (five axes) machining center ③ The version of PMC denotes the version control code name designed by PMC application program(ladder).							

5: Spindle stop:

Spindle stop	Manual mode: pressing down "Spindle Stop" button to stop the spindle
	Auto mode: "M05"
	The spindle will stop after pressing down Emergency Stop button
	For mechanical orientation, orientation locking pin is not properly released so that the spindle can't rotate.
	In the state of tool releasing, the spindle is locked and not allowed to rotate by M6302 instruction.

Cycle start is invalid without the signal of spindle ready (NC spindle ready detecting opening)

6. Interlocking of spindle clockwise/counterclockwise rotating

The spindle clockwise/counterclockwise rotating can't be switched directly, and must be started in the state of spindle stop.

Appropriate operation:

Auto mode: M03 <=====>M05<=====>M04;

Manual mode: spindle clockwise rotating <=====>spindle stop<=====>spindle counterclockwise rotating.

7. M23: Toolpost forward; M24: Toolpost backward.

- The forward output instruction (TFR.0, DGN: 0.4)of toolpost is set to 1 after M23 is input. While the toolpost is in-position, its forwarding finishes with the forward in-position detecting of toolpost changing for 1. M23 instruction is completed. And M23.C (DGN: 225.4) is set to 0 with

the output forward instruction of toolpost (TFR.0, DGN: 0.4) changing for 0. And the forward in-position detecting of toolpost (TFN.I, DGN: 34.6) is set to 1.

- The backward output instruction of toolpost (TBK.0, DGN: 0.5) is set to 1 after M24 is executed. As the toolpost retracts to the position, the backward operation finishes with the backward in-position detecting (TBK.I, DGN: 34.7) set to 1. And M24 finishes with M24.C (DGN: 225.5) set to 0, the toolpost backward output instruction (TBK.0, DGN: 0.5) set to 0. The backward in-position detecting of toolpost (TBK.I, DGN: 34.7) is set to 1.

8. T function

- The current tool number is displayed in DGN.064, the target tool number is displayed in DGN.71.
- In tool change, after comparing the target tool number with the current tool number in toolpost, change the tools as near as possible. After the tool change, the toolpost stops.
(If the output signal TC.O(DGN:1.0) is 1, the toolpost rotates forward.)
(If the output signal TCC.O(DGN:1.1) is 1, the toolpost rotates backward.)
- Total tool numbers:16. The total tool numbers can be changed by the counter presetting value of counter in M6302.
- As for the tool number T0 or T17, T18...which are more than T16 tool number, TZ.ACM (DGN: 223.5) or TNO.AC (DGN: 223.6) alarm, but the system will continue operation normally.
- The current tool number is displayed with octal system by numerical indicator tube.

	Decimal system	Octal system	Displaying	Decimal system	Octal system	Displaying
Tool number	01	01	01	09	11	11
	02	02	02	10	12	12
	03	03	03	11	13	13
	04	04	04	12	14	14
	05	05	05	13	15	15
	06	06	06	14	16	16
	07	07	07	15	17	17
	08	10	10	16	20	20

9. Tool releasing or clamping

- The releasing/clamping operation must be performed during the spindle stopping, and the spindle only rotates in the tool clamping. During the tool releasing, the spindle is locked and not allowed to rotate by M6302 instruction.
- Manual tool releasing: The 25Pin (DGN: 38.7) signal CK.ST of C01 is controlled by the releasing button on the spindle. Press it for tool releasing, then press it again for tool clamping. The state of tool releasing or clamping is memorized by system(DGN: 599.0).
- Instructions for tool releasing and clamping: M21: Tool clamping; M22: Tool releasing
- Detection of tool releasing or clamping:
The input point of tool clamping detecting: 12 Pin(DGN: 38.6) of C 0 1
The input point of tool releasing detecting: 24 Pin(DGN: 38.5) of C 0 1
- Parameters: PC parameter 3001.3(DGN: 600.3) for tool clamping detecting is valid; PC parameter 3001.4(DGN: 600.4) for releasing detecting is valid. Set to 1 for detecting; set to 0 for no detecting.
When the detection is valid, if DGN: 38.6 is not set to 1, M21 is not executed, if DGN: 38.5 is not set to 1, M22 is not executed.

10. Cooling function

- If Cooling on operator panel is invalid(indicator not lighting up), the running program jumps over

M8 and M9 instructions.

- If Cooling on operator panel is valid(indicator lighting up),the ON/OFF of the cooling is controlled by M8 and M9 instructions and manual control is still valid.

11. Rapid override

In Auto mode, the rapid override is selected by X 1 、 X 2 、 X 3 , its correspondence is as follows:

X1→F0% X10→50% X100→100%

X1→F0% X10→50% X100→100%

12. Spindle shifting gear: (Only for spindle B)

- In Auto mode, if M41 is commanded, the output point 0.1 is set to 1; if M42 is commanded, the output point 0.2 is set to 1; if M43 is commanded, the output point 0.3 is set to 1; if M44 is commanded, the output point 0.4 is set to 1.

		Gear 1	Gear 2	Gear 3	Gear 4
Output point of shifting gear	Signal	M41	M42	M43	M44
	Diagnosis No.	0.1	0.2	0.3	0.4
Input point of shifting gear in-position	Signal	GR1.M	GR2.M	GR3.M	GR4.M
	Diagnosis No.	38.0	38.1	38.2	38.3

If M41 is commanded without GR1.M, the shifting gear is not performed;

If M42 is commanded without GR2.M, the shifting gear is not performed;

If M43 is commanded without GR3.M, the shifting gear is not performed;

If M44 is commanded without GR4.M, the shifting gear is not performed;

While GR1.M is 1, the spindle speed parameter is 361(gear 1)

While GR2.M is 1, the spindle speed parameter is 362 (gear 2)

While GR3.M is 1, the spindle speed parameter is 363 (gear 3)

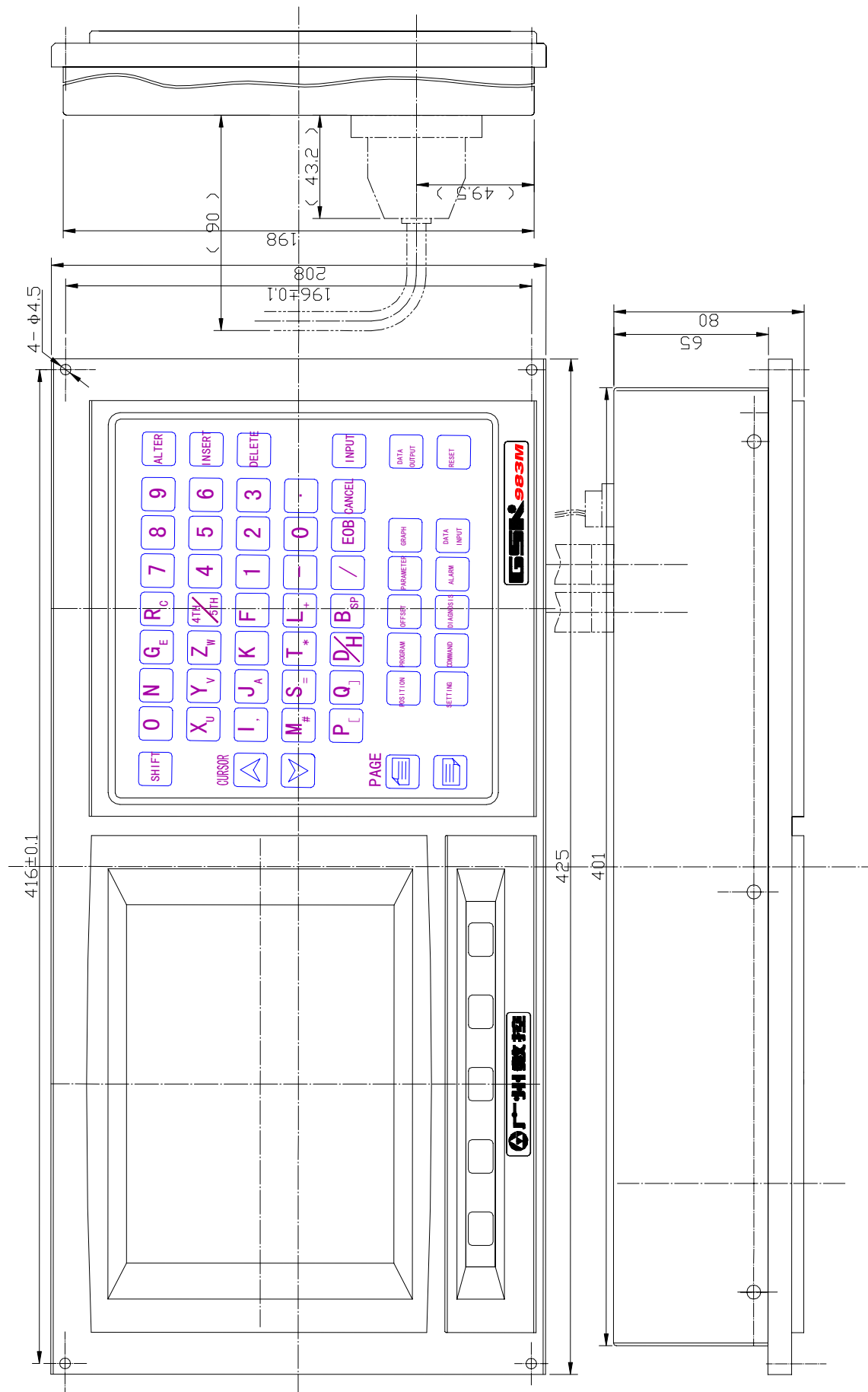
While GR4.M is 1, the spindle speed parameter is 364 (gear 4)

13. Spindle orientation (M19) function

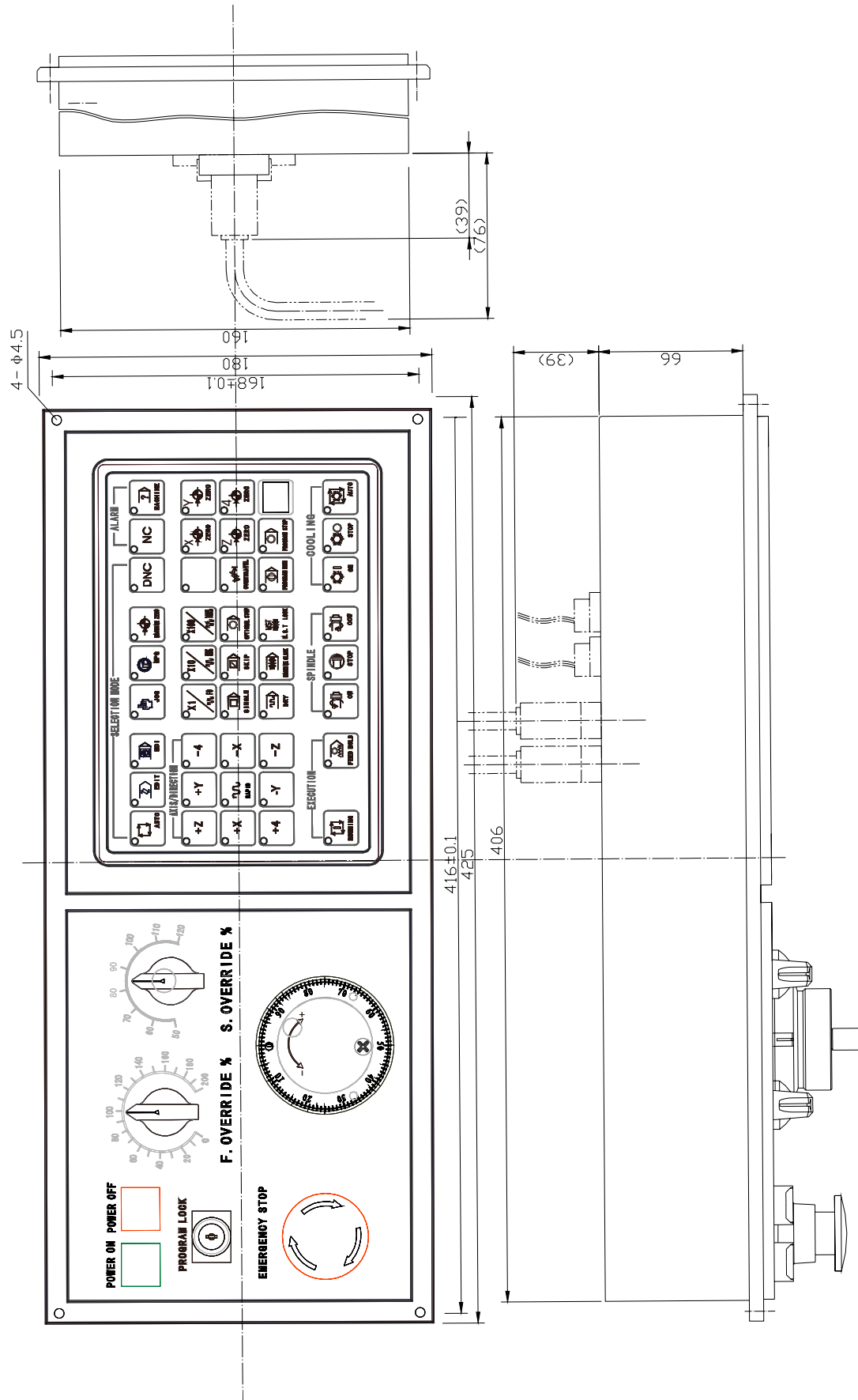
- Electric orientation: After PC parameter 3001.5(DGN: 600.5) is set to 0, the electric orientation:

When M19 is commanded, M19.0 (DGN: 0.6) is output if spindle doesn't stop, and the spindle servo begins its orientation, as the orientation is in-position, the input signal SOR. M (DGN: 39.4) is set to 1, which means the orientation and M19 instruction have been finished, but the spindle is still locked and the output signal M19.0 (DGN: 0.6) of M6302 still remains for 1 and M19.C (DGN: 255.3) is set to 0. Once the spindle clockwise or counterclockwise rotation signal is output, the M19.0 (DGN: 0.6 set to 1) output will be cancelled. The spindle will be released to rotate normally.

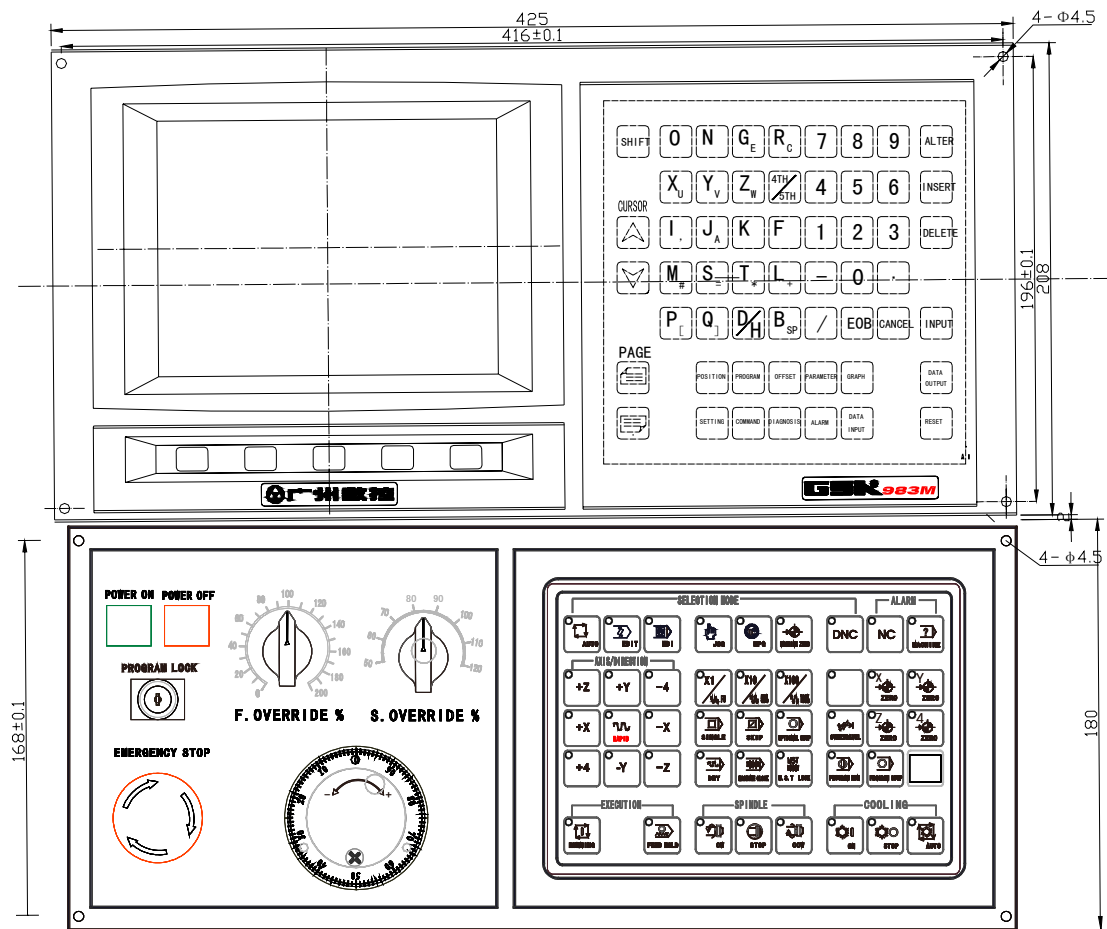
Installation dimension of the main cabinet



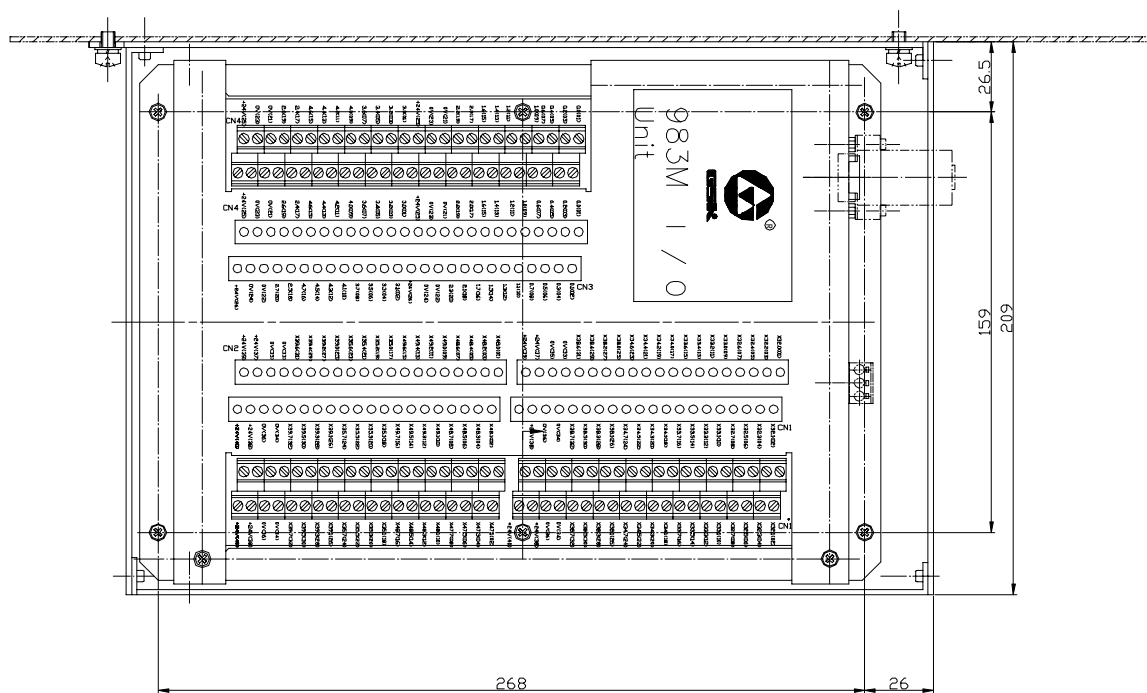
MDI/LCD panel installation dimension



Operator panel installation dimension



MDI/LCD panel and operator panel installation dimension



External I/O unit installation dimension

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