

ER SERVICE MANUAL

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1. Introduction

1.1. Preface

Thank you for purchasing of our CAS scale.

This scale has been designed with CAS reliability, under rigid quality control and with outstanding performance.

WE hope that your departments enjoy with high quality of CAS product.

This manual will help you with proper operations and care of the EB series.

Please keep it handy for the future references.

1.2. Precaution

- Make sure that you plug your scale into the proper power outlet.
- Place the scale on a flat and stable surface.
- Plug into a power outlet 30 minutes before operations.
- Keep the scale away from strong EMI noises may cause incorrect weight readings.
- This scale must be installed in a dry and liquid free environment.
- Do not subject the scale to sudden temperature changes.
- Do not subject the platter to sudden shocks.
- If the scale is not properly level, please adjust the 4 legs at the bottom of the scale (turn legs clockwise or counterclockwise) so as to center the bubble of the leveling gauge inside the indicated circle.

1.3. Specification

1.3.1. Kilogram (kg) Version

	ER – 6	ER – 15	ER – 30
Capacity	<u>Dual Interval</u> 3 kg / 0.001 kg 6 kg / 0.002 kg	<u>Dual Interval</u> 6 kg / 0.002 kg 15 kg / 0.005 kg	<u>Dual Interval</u> 15 kg / 0.005 kg 30 kg / 0.01 kg
Internal Resolution	1 / 60,000	1 / 60,000	1 / 60,000
External Resolution	1 / 3,000	1 / 3,000	1 / 3,000
Display	Three LCDs with 6 digit Three VFDs with 6 digit Three LEDs with 6 digit		
Symbols	Power, Zero, Tare, Low battery, Backlight (Option for LCD version)		
Interface	RS – 232C (Printer Option)		
Keys	ZERO(ESC), TARE, MODE, SET(ENTER), NUBERICAL KEY (0~9), C, POWER ON/OFF, '+', '-', 'x', 'Σ', DIRECT PLU KEY(M1~M5), PLU SAVE, CALL-UP KEY(►M, M►) € (Euro currency convertible keys).		
Function	Weighting AUTO POWER OFF BACK LIGHT AUTO ON/OFF PLU PRINTER INTERFACE (RS-232) ETC...		
Product Size	360 (W) X 350 (D) X 106 (H)		
Platter Size	304 (W) X 220 (D)		
Operating Temperature	- 10 °C ~ +40 °C		
Options	Recharge Battery, BACK LIGHT (LCD ONLY)		

1.3.2. Pound (lb) Version

	ER – 15LB	ER – 30LB	ER – 60LB
Capacity	<u>Dual Interval</u> 6 lb / 0.002 lb 15 lb / 0.005 lb	<u>Dual Interval</u> 15 lb / 0.005 lb 30 lb / 0.01 lb	<u>Dual Interval</u> 30 lb / 0.01 lb 60 lb / 0.02 lb
Internal Resolution	1 / 60,000	1 / 60,000	1 / 60,000
External Resolution	1 / 3,000	1 / 3,000	1 / 3,000
Display	Three LCDs with 6 digits (WEIGHT, UNIT, PRICE) One VFD with 7 digits, One VFD with 12 digits (WEIGHT, UNIT, PRICE: 6 digits) Three LEDs with 6 digits (WEIGHT, UNIT, PRICE)		
Symbols	Power, Zero, Tare, Low battery, Backlight (Option for LCD version)		
Interface	RS – 232C (Printer Option)		
Keys	ZERO(ESC), TARE, MODE, SET(ENTER), NUMERICAL KEY (0~9), C, POWER ON/OFF, '+', '-', 'x', 'Σ', DIRECT PLU KEY(M1~M5), PLU SAVE, CALL-UP KEY(▶M, M▶) € (Euro currency convertible keys).		
Functions	Weighting AUTO POWER OFF BACK LIGHT AUTO ON/OFF PLU PRINTER INTERFACE (RS-232) ETC...		
Product Size	360 (W) X 350 (D) X 106 (H)		
Platter Size	304 (W) X 220 (D)		
Operating Temperature	- 10 °C ~ +40 °C		
Options	Recharge Battery, BACK LIGHT (LCD ONLY)		

1.4. LCD Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LCDs with 6 digits, POWER LED		
Power	12 V Adaptor or PB BATTERY (6V3.6AH/20HR)		
Option	Backlight Auto Power Off		

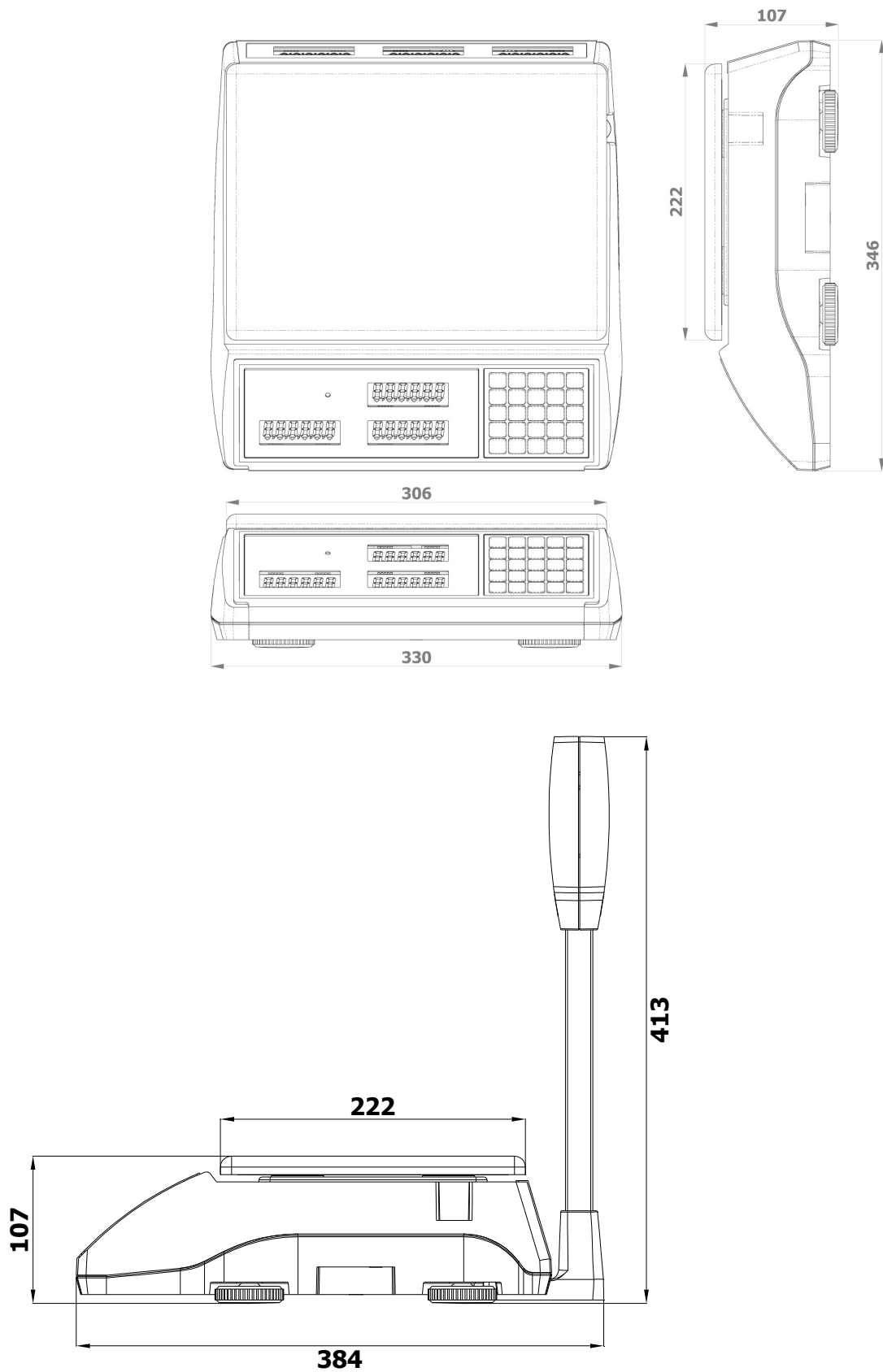
1.5. VFD Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	One VFD with 7 digits, One VFD with 12 digits (WEIGHT, UNIT, PRICE: 6 digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V3.6AH/20HR)		

1.6. LED Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LEDs with 6 digits, POWER LED		
Power	12 V Adaptor or PB BATTERY (6V3.6AH/20HR)		

1.7. Dimension



1.8. Sealing Method

REVISIONS		2		3			
MODEL NO.	PART NO.	REV	SYM	CONTENTS	DRAWN	CHECKED	APPROVED
NO	PARTS NAME	SPECIFICATION			Q'TY	REMARK	
TOLERANCES .UNLESS OTHERWISE SPECIFIED		NAME OR TITLE			 CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO, KOREA		
ANGULAR $\pm$ N/A		SEALING METHOD					
E	DECIMAL $\pm$ N/A	FIRST USED IN ASSEMBLY SHOPPING SCALE			MATERIAL N/A		
		FIRST MADE FOR ER			END FINISH SEE NOTES		
		CONTRACT OR CUSTOMER NO WORLD WIDE			DO NOT SCALE DRAWING DIMENSIONS ARE IN MM. INCH		
DRAWN		CHECKED	CHECKED	APPROVED	SCALE	DRAWING.PART NO.	REV
					N/A	3005-ER0-0000	0
.20		.20	.20	.20			
1		2		4	CAS FORM A4 (210mmx297mm)		

REVISIONS		2		3					
MODEL NO.	PART NO.	REV	SYM	CONTENTS	DRAWN	CHECKED	APPROVED		
A							A		
B							B		
C							C		
D							D		
NO		PARTS NAME		SPECIFICATION		Q'TY		REMARK	
TOLERANCES .UNLESS OTHERWISE SPECIFIED		NAME OR TITLE				 CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO, KOREA			
ANGULAR ± N/A		SEALING METHOD							
DECIMAL ± N/A		FIRST USED IN ASSEMBLY				MATERIAL			
E		TICKET PRINTING SCALE				N/A			
FIRST MADE FOR		ER				END FINISH			
CONTRACT OR CUSTOMER NO		WORLD WIDE				SEE NOTES			
DO NOT SCALE DRAWING		DIMENSIONS ARE IN MM				INCH			
DRAWN		CHECKED		CHECKED		APPROVED		SCALE	
N/A		3005-ER0-0001		O					
.20		.20		.20		.20			
1		2		4					

CAS FORM A4 (210mmx297mm)

2. Calibration

2.1. General Calibration

Pressing and holding calibration switch press [POWER] key to go to calibration mode.

User can move to other mode by using [ZERO] key in the calibration mode.

User also moves to other sub-modes for each mode by using [TARE] key.

Please simply follow below procedure to move to other mode.

(1) Calibration Mode: Pressing and holding "Calibration Switch" press [POWER] key.

(2) It displays "CAL-0" after "CAL", and it blinks the version of scale three times.

(3) Selecting menu: press [TARE].

(4) ENTER(Setting) : [TARE] key

MODE	Function
CAL 1	Display normalized AD
CAL 2	Display Keypad information-
CAL 3	Weight Setting Mode "UnLoad" → [TARE] → "MIDD" → [TARE] after loading for 1/3 weight → "FULL" → [TARE] after loading for Full weight → "MIDD" → [TARE] after loading for 1/3 weight → "END"
CAL 4	Option Setting (Table 1 참조)
CAL 5	Display filtered Raw AD
CAL 6	Function setting on each Key (Table 2 참조)
CAL 7	% Calibration
CAL 8	Battery calibration
CAL 9	Gravity constant
CAL 10	Set calibration factor "Unit" → [TARE] → select 0, 1 (0:kg, 1: lb) → [TARE] "CAPA" → [TARE] → select capacity → [TARE] "MCAPA" → [TARE] → select mid-capacity → [TARE] "W-dP" → [TARE] → Select Decimal Point → [TARE] " 1 d " → [TARE] → Select division → [TARE] "Dual" → [TARE] → Enable dual interval (0:disable, 1:enable) → TARE
CAL 11	Set nation(00 : OIML , 01 : NTEP , 02: KOREA)

< Modes >

2.1.1.1. C4 Setting

2.1.1.1.1. C4-1 Setting

BIT 6~7	Initial Zero range	3	5%
		2	10%
		1	3%
		0	2%
BIT5	Tare Type	0	Proper tare
		1	Full Tare
BIT4			
BIT 2~3	Successive tare	3	(+), (-) Direction successive Tare
		2	(-) Direction successive Tare
		1	(+) Direction successive Tare
		0	One Time tare
BIT1			
BIT0			

2.1.1.1.2. C4-2 Setting

BIT7			
BIT6	Use PLU Tare	1	Use
BIT5	Use PLU Name	0	Don't use
		1	Use
BIT4	Use Daily Total	0	Don't use
		1	Use
BIT3	Clear Price	0	Don't clear
		1	Clear
BIT2	Clear Tare	0	Don't clear
		1	Clear
BIT1	Use Euro	0	Don't use
		1	Use
BIT0	Power On Euro	0	No
		1	Yes

2.1.1.1.3. C4-3 Setting

BIT7	Dot Type	0	"." dot
		1	"," comma
BIT6	Use Preset tare	0	Don't use

		1	Use
BIT5	Use Back light	0	Don't use
		1	Use
BIT4	Use Head message	0	Don't use
		1	Use
BIT3	Use gram	0	Don't clear
		1	Clear
BIT2	Use oz	0	Don't clear
		1	Clear
BIT1	Use lb	0	Don't use
		1	Use
BIT0	Use Kg	0	No
		1	Yes

2.1.1.4. C4-4 Setting

BIT7	X	
BIT6	X	
BIT 4~5	Price round off	3 00, 25, 50, 75
		2 00, 10, 20
		1 0, 5
		0 normal
BIT3	X	
BIT2	X	
BIT 0~1	Unit / Price	3 1000/1
		2 100/1
		1 10/1
		0 1/1

2.1.1.5. C4-5 Setting

BIT7	Use Standby time	0	Don't use
		1	Use
BIT6 ~BIT4	Price decimal point	7	Special case
		6	0.000000
		5	0.00000
		4	0.0000
		3	0.000
		2	0.00

		1	O.O
		0	O
BIT3	Use Unit message	0	Don't use
		1	Use
BIT2	Use Total price window over	0	Don't use
		1	Use
BIT 0~1	Print type	3	Don't use
		2	DEP-50
		1	
		0	

2.1.2.SPAN Calibration Setting (C-3)

- (1) Pressing and holding "Calibration Switch" press [POWER] key.
After "CAL" message blinks three times and shows the version of scale, it displays "CAL 1" message.
- (2) Press [ZERO] to display "CAL-3".
- (3) Press [TARE] key and then it displays "zero " message.
- (4) Press [TARE] key and then it displays "midup" message
- (5) Load middle weight (ex:1/3 full capacity) on the platform
- (6) Press [TARE] key and then it displays "span " message
- (7) Load full weight on the platform
- (8) Press [TARE] key and then it displays "middn" message
- (9) Load middle weight (ex:1/3 full capacity) on the platform
- (10) Press [TARE] key and then it display "CAL 3" message

2.1.3. Gravity Constant Value Setting (C-9)

Current gravitational Acceleration value is set to 9.7994 m/s^2 .

- (1) Pressing and holding "Calibration Switch" press [POWER] key.
After "CAL" message blinks three times and shows the version of scale, it displays "CAL-1" message.
- (2) Press [ZERO] to display "C-9".
- (3) Press [TARE] key, and then " G-1" message and "9.7994" will be shown. The first digit,"9" will blink.
- (4) Input a gravitational acceleration value by using [ZERO] key.
- (5) Press [TARE] key, and then "G-2" message blinks."9.7994" will be shown. The first digit,"9" will blink.

- (6) Input a gravitational acceleration value by using [ZERO] key.
- (7) Press [TARE] key to save the gravitational acceleration value, and "C-9 " message will be shown.

2.1.4. Calibration factor Setting (C-10)

- (1) Pressing and holding "Calibration Switch" press [POWER] key.
- (2) After "CAL" message blinks three times and shows the version of scale, it displays "CAL-1" message.
- (3) Press [ZERO] to display "C-10".
- (4) Press [TARE] key, and then "UNIT " message and "0" will be shown. The first digit,"0" will blink. It means calibration unit is "kg" (0 : kg, 1 : lb)
- (5) Input a calibration unit by using [ZERO] key.
- (6) Press [TARE] key, and then "CAPA" message blinks."0015" will be shown. The first digit,"0" will blink. It means a full-capability is "15 (calibration unit, kg or lb)"
- (7) Input a capability by using [ZERO] key.
- (8) Press [TARE] key, and then "MCAPA" message blinks."0005" will be shown. The first digit,"0" will blink. It means a mid-capability is "05 (calibration unit, kg or lb)"
- (9) Input a capability by using [ZERO] key.
- (10) Press [TARE] key, and then "W-dP " message blinks."3" will be shown. The first digit,"3" will blink. It means a weight decimal point is "3 (will display 0.000)"
- (11) Input a weight decimal point by using [ZERO] key.
- (12) Press [TARE] key, and then "1d " message blinks."0.005" will be shown. The third digit,"0" will blink. It means a division is "0.005 (calibration unit, kg or lb)"
- (13) Input a division by using [ZERO] key.
- (14) Press [TARE] key, and then "dual " message blinks."1" will be shown. The third digit,"1" will blink. It means a dual interval is disable. (0 : disable, 1 : enable)"
- (15) Input a dual interval enable by using [ZERO] key.
- (16) Press [TARE] key to save the calibration factor, and "C-10 " message will be shown.

2.1.5. Displaying Real A/D Value (C-5)

Display Raw AD

2.1.6. Input Function Key Code (C-6)

(1) Under the calibration switch ON press [POWER] key.

➤ "CAL" message blinks three times.

(2) Press [ZERO] to display "C-6".

(3) "E-SET" display on the weight window.

(4) "XX" message shows up on the total price window.

(5) Input "Soft Key Code" in the following table.

For first example, press `16` as SOFT KEY CODE and then press `+` key.

For second example, press `19` as SOFT KEY CODE and then `Σ` key.

(5) Press `C` key to exit from "Input Soft Key Code" mode.

- NOTE: User doesn't need MATRIX KEY CODES by inputting soft key code because MATRIX KEY CODES are fixed in hardware.

* FIXED KEYS & THEIR SOFT KEY CODES

KEYS	MATRIX KEY CODES	SOFT KEY CODES
"0" through "9"	0 through 9	0 through 9
"C"	10	10
"ON/OFF"	12	12
"ZERO"	13	13
"TARE"	14	14

* CHANGEABLE KEYS & SOFT KEY CODES

FUNCTION	SOFT KEY CODES	REMARK
"00"	11	
ADD	16	
TTP CALL	18	
PAY	19	
MR	20	
MW	21	
CAN	22	
MODE	23	
1/2	24	
1/4	61	25
PRE PACK	26	

KG/LB	27	
TEST	28	
HOLD	29	
PRINT	30	
NO FUNCTION	31	
EURO	60	
PERSENT TARE	62	
TARE SAVE	63	
BOTH SAVE	64	
PERSET	65	
MUL "X"	66	
PLU	32~59	

2.1.7. Percent Calibration (C-7)

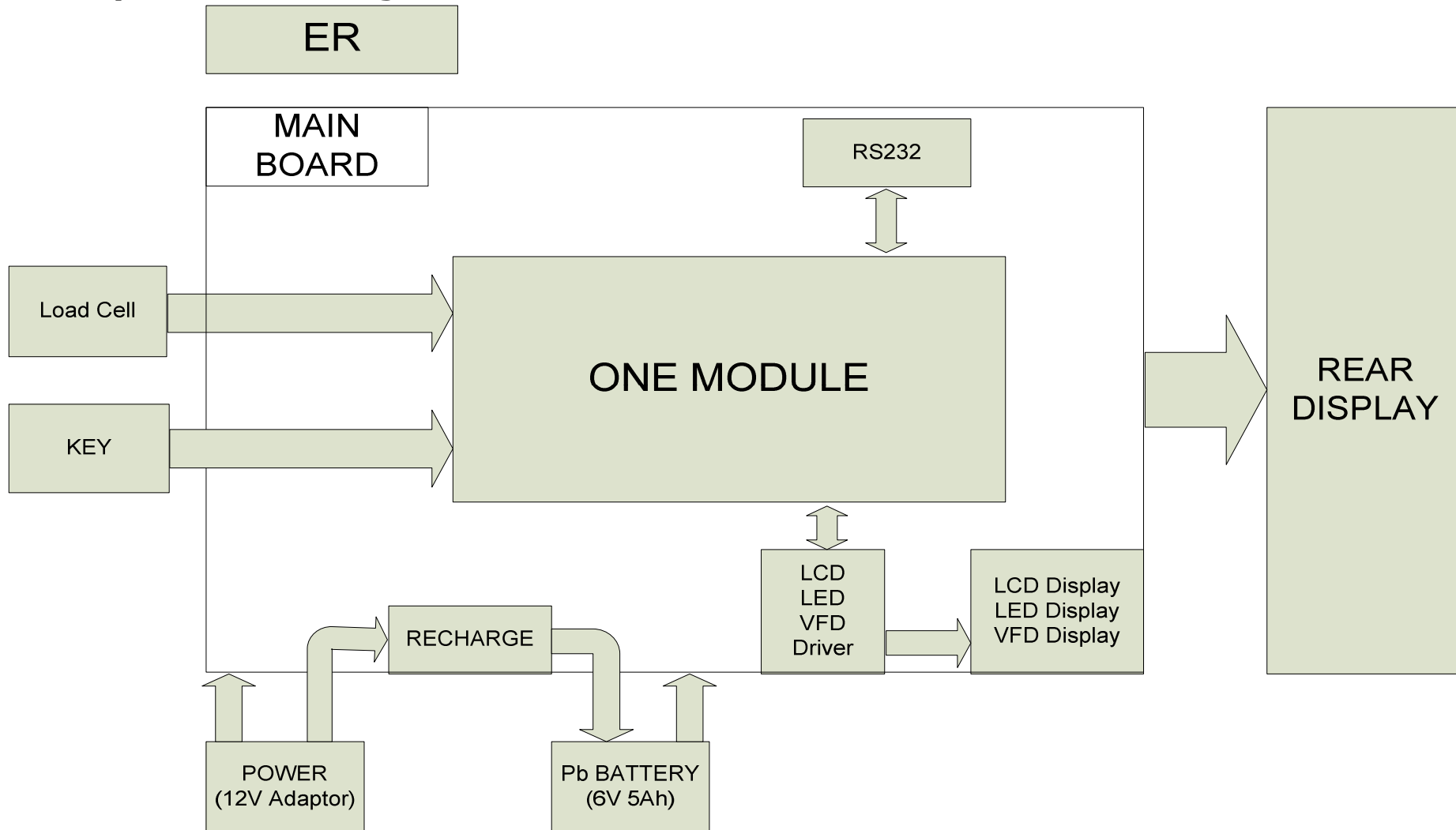
- (1) Pressing and holding "Calibration Switch" press [POWER] key.
 After "CAL" message blinks three times and shows the version of scale, it displays "CAL 1" message.
- (2) Press [ZERO] to display "CAL-7".
- (3) Press [TARE] key and then it displays "per 0 " message. Select the percent value using the
 [numeric] key. You can choose 10~90 percent.
- (4) Press [TARE] key and then it displays "zero" message
- (5) Press [TARE] key and then it displays "pspan " message
- (6) Load choice percentage weight of full weight on the platform
- (7) Press [TARE] key and then it displays "CAL 7" message

2.1.8. Battery Calibration (C-8)

- (1) Pressing and holding "Calibration Switch" press [POWER] key.
 After "CAL" message blinks three times and shows the version of scale, it displays "CAL 1" message.
- (2) Press [ZERO] to display "CAL-8".
- (3) Press [TARE] key and then it displays voltage of battery.
- (4) Change the jumper-pin of main PCB, 'BAT' to '+5V'.
- (5) Press [ZERO] key two times and then Press [-] key two times.
 And then it display '500'
- (6) Change the jumper-pin of main PCB, '+5V' to 'BAT'.
- (7) You can see the calibrated voltage of battery.

3. The Schematics and Diagram

3.1. System Block Diagram

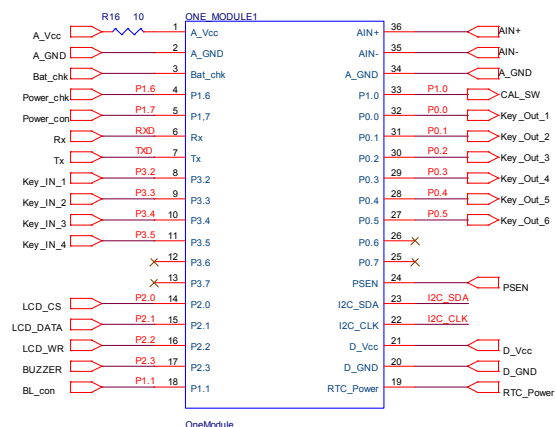


3.2. Circuit Diagram

3.2.1. LCD Version

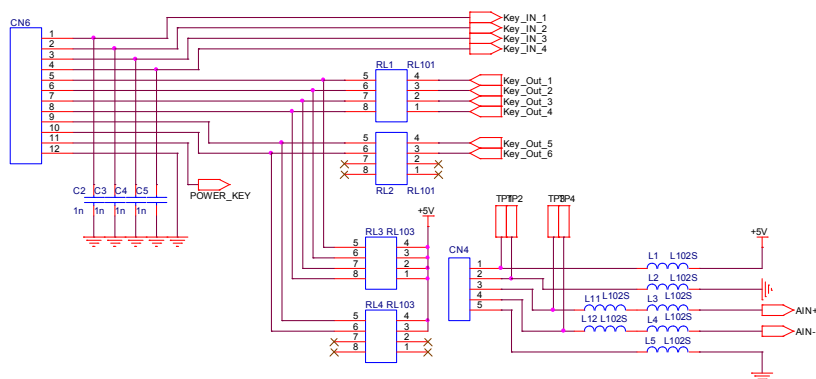
3.2.1.1. Main

MODULE CONNECTOR PART

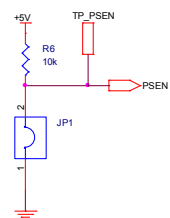


Key Connector PART

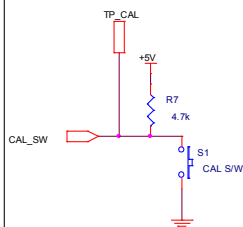
LOADCELL PART



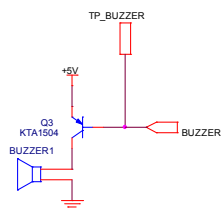
PROGRAM PART



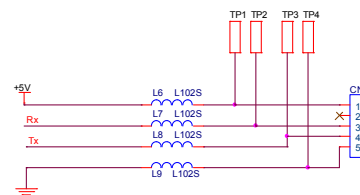
CAL PART



BUZZER PART



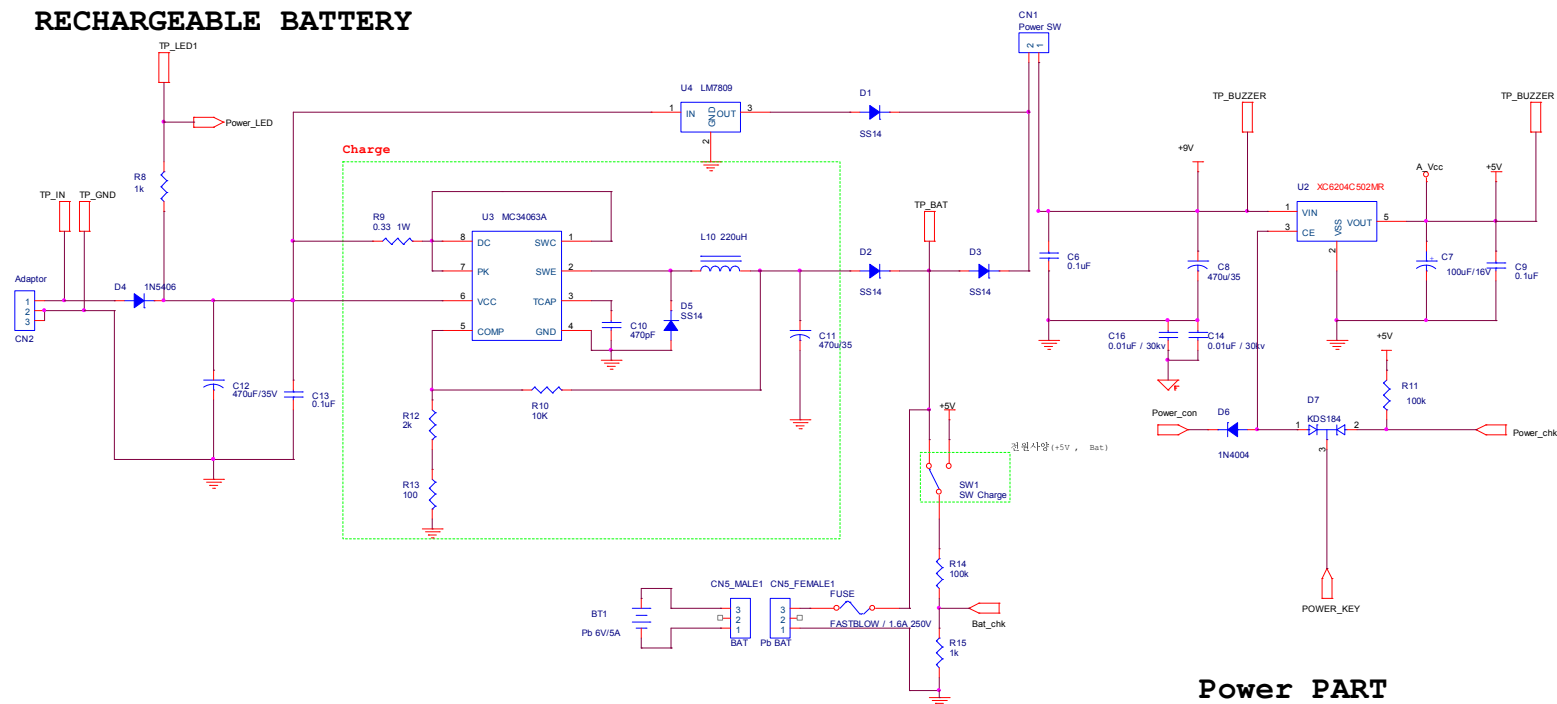
RS232 DRIVER PART



Title		
ER-LCD MAIN CIRCUIT		
Size	Document Number	Rev
B	6100-PER-0001	A
Date:	Wednesday, May 30, 2007	Sheet 2 of 9

3.2.1.2. Power part

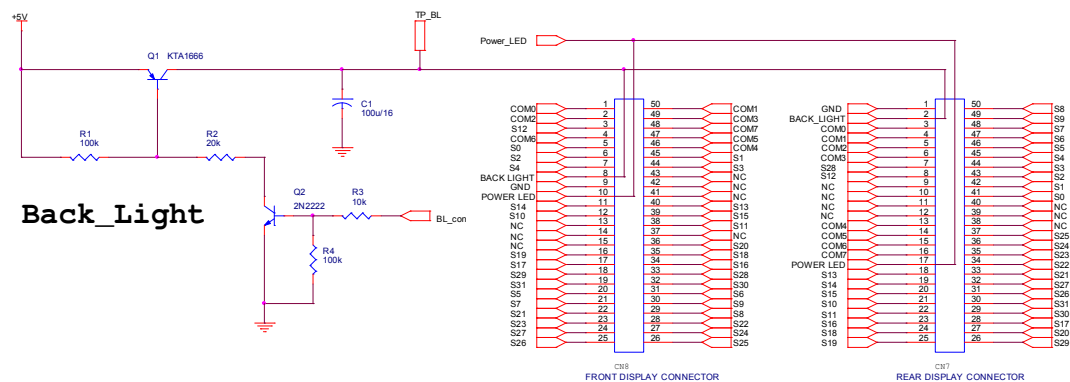
RECHARGEABLE BATTERY



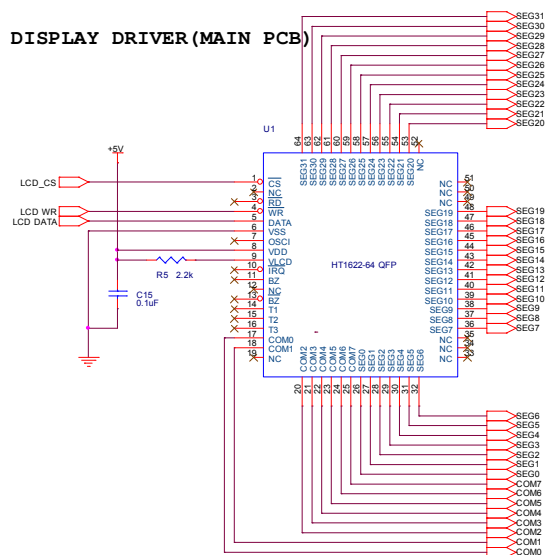
Power PART

Title		
ER-LCD POWER CIRCUIT DIAGRAM		
Size	Document Number	Rev
A3	6100-PER-0001	A
Date:	Friday, June 29, 2007	Sheet 3 of 9

3.2.1.3. Display Part

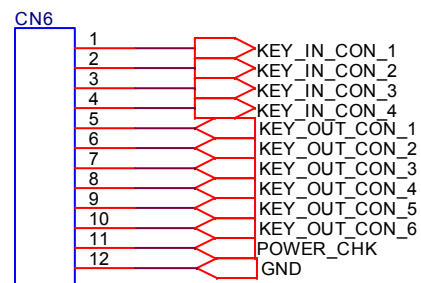


DISPLAY DRIVER (MAIN PCB)

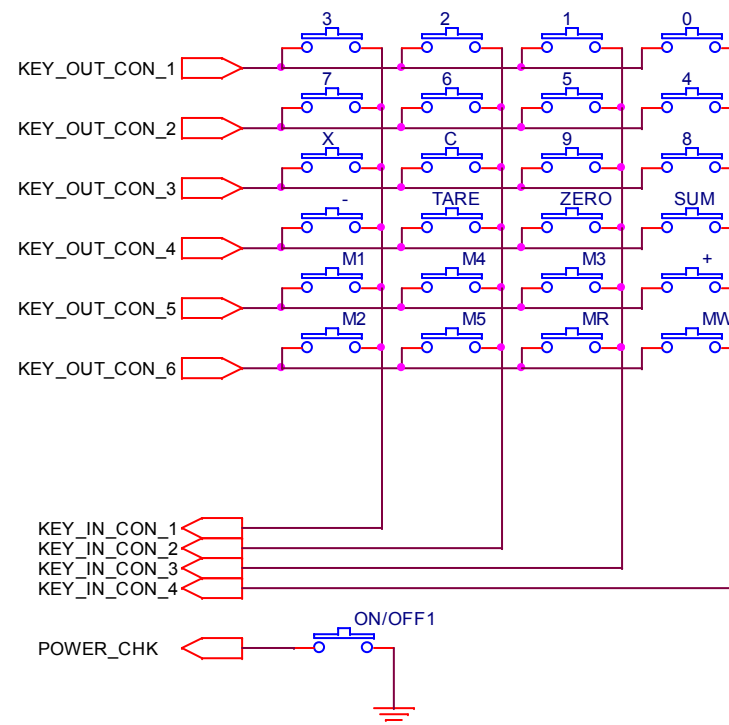


Title		
ER1_LCD DISPLAY Main		
Size	Document Number	Rev
A3	6100-PER-0001	A
Date	Wednesday, May 30, 2007	Sheet 1 of 9

3.2.1.4. Key Part

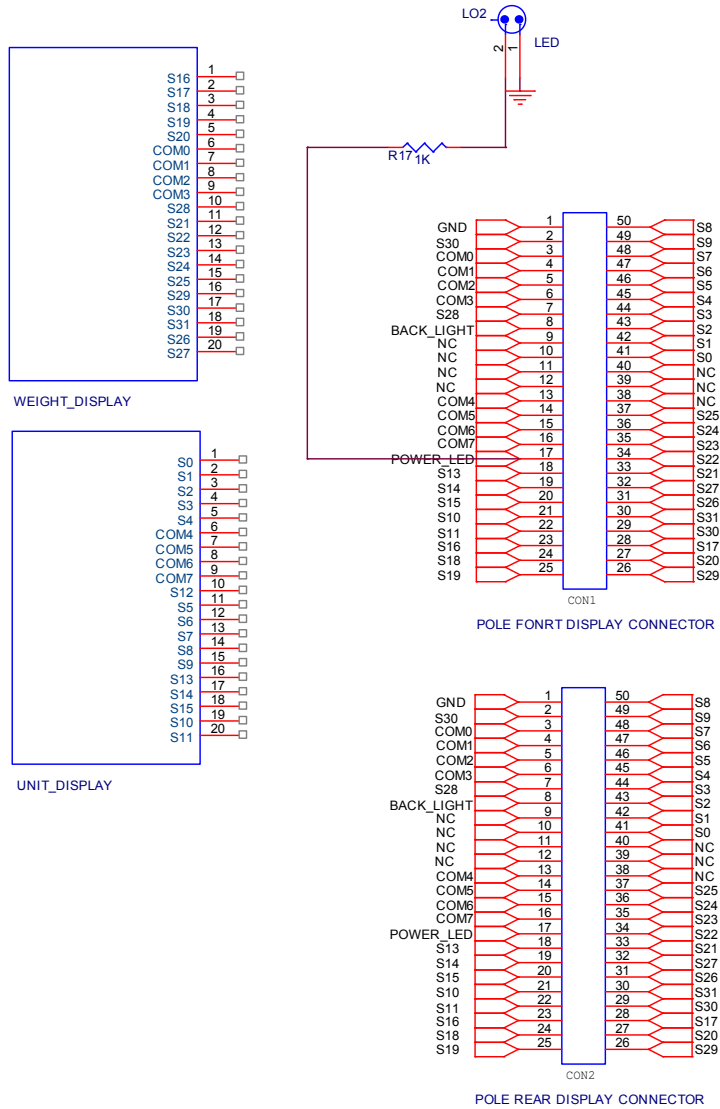


ER Service Manual



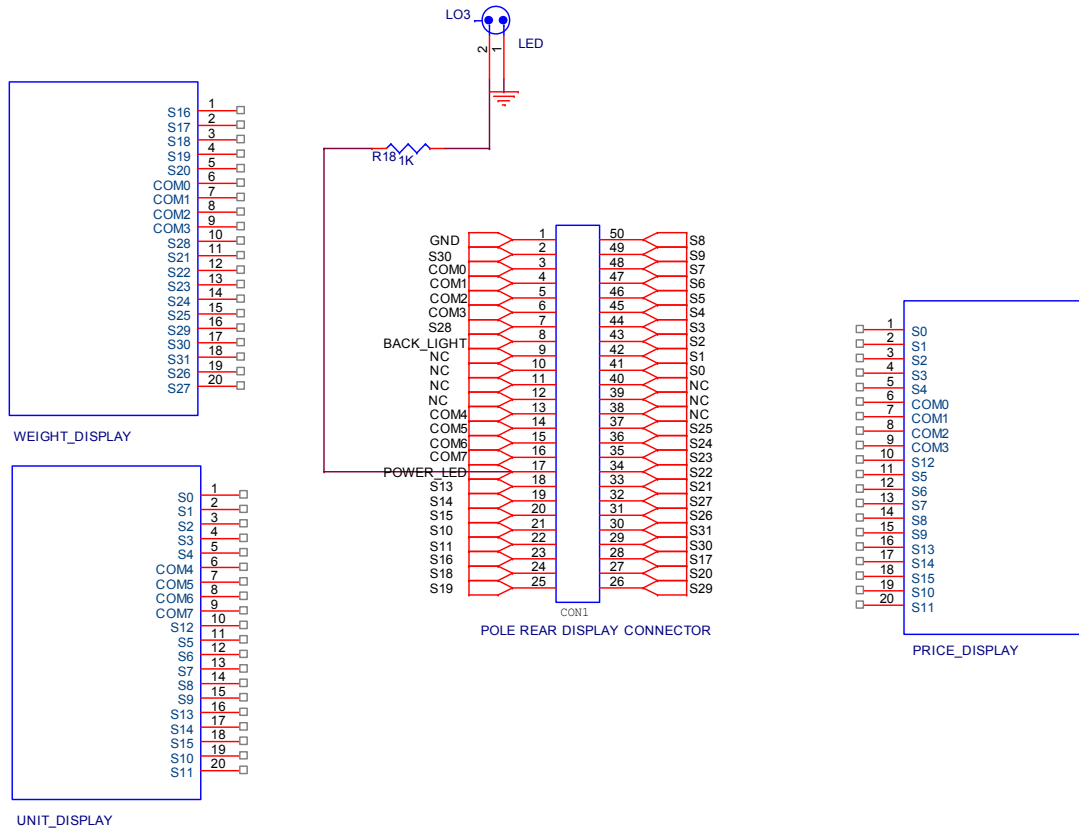
Title		
ER KEY CIRCUIT		
Size A	Document Number 6100-PER-0001	Rev A
Date:	Wednesday, May 30, 2007	Sheet 8 of 9

3.2.1.5. Pole front display Part



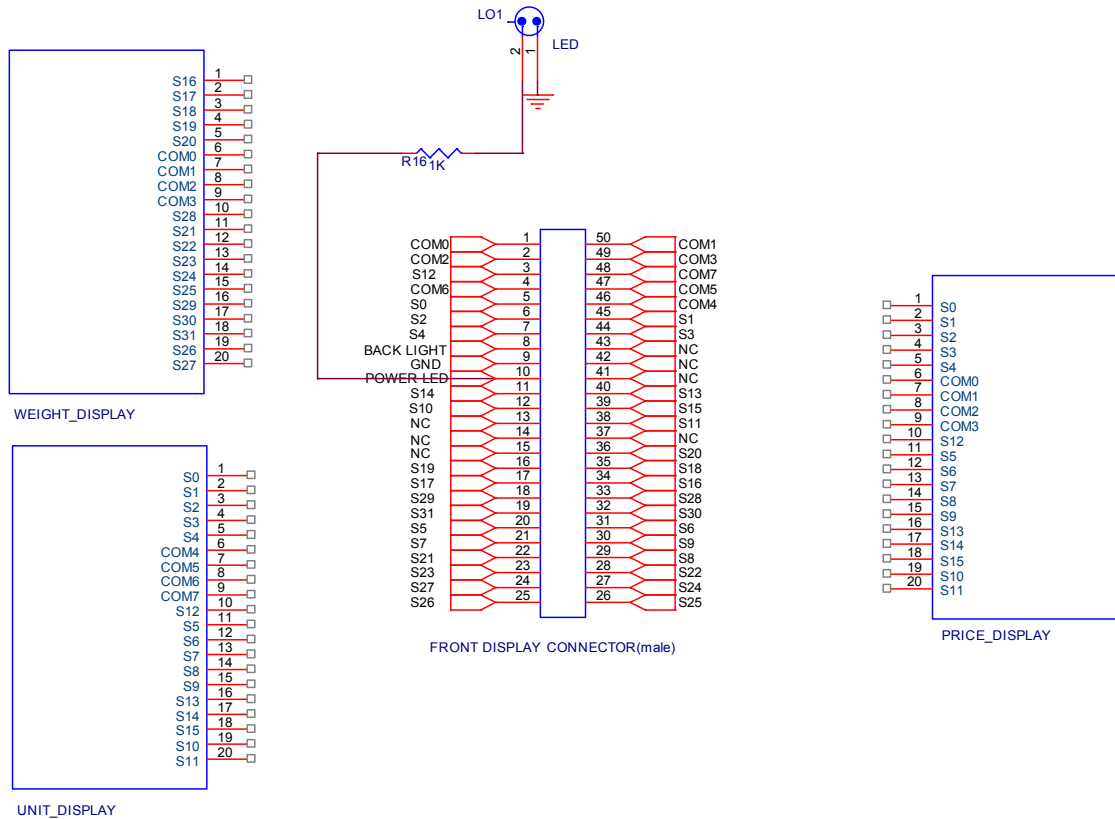
Title		
ER_LCD_POLE_FRONT_DISPLAY PCB		
Size	Document Number	Rev
A4		0
Date:	Monday, March 12, 2007	Sheet 5 of 9

3.2.1.6. Pole rear display Part



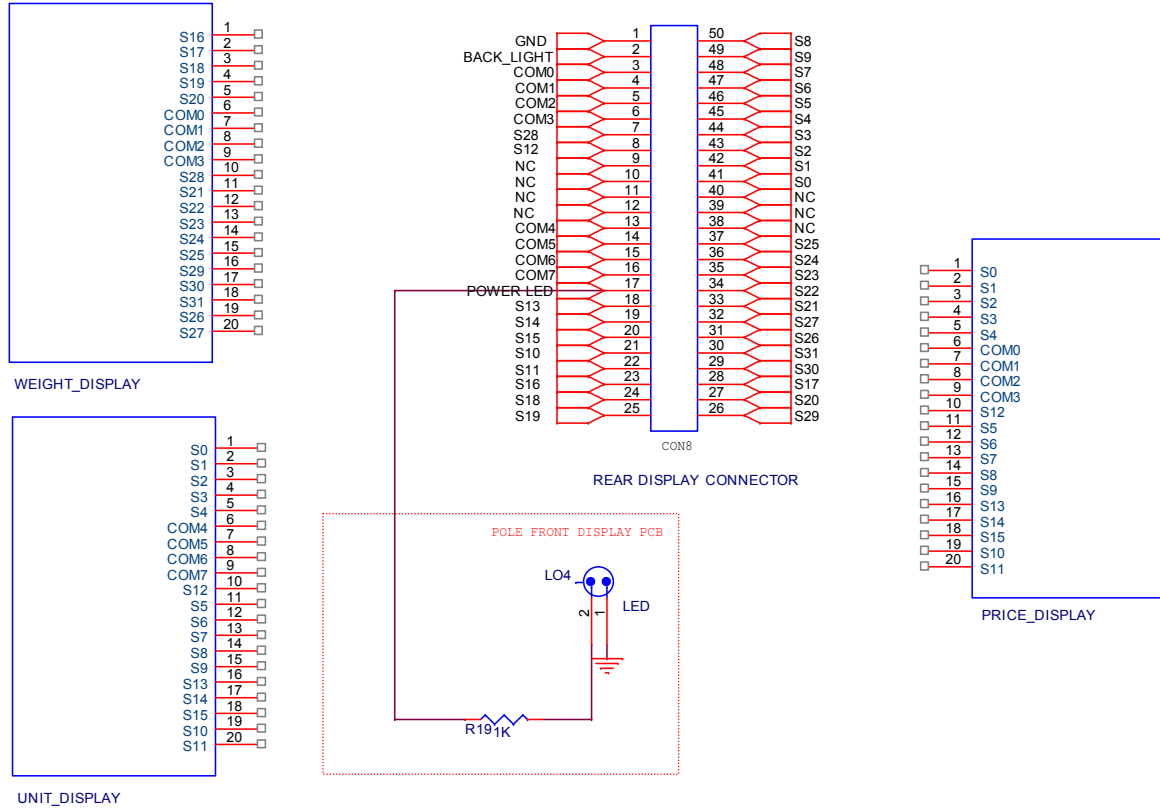
Title		
ER_LCD_POLE_REAR_DISPLAY PCB		
Size	Document Number	Rev
A4		0
Date:	Monday, March 12, 2007	Sheet 6 of 9

3.2.1.7. Front display Part



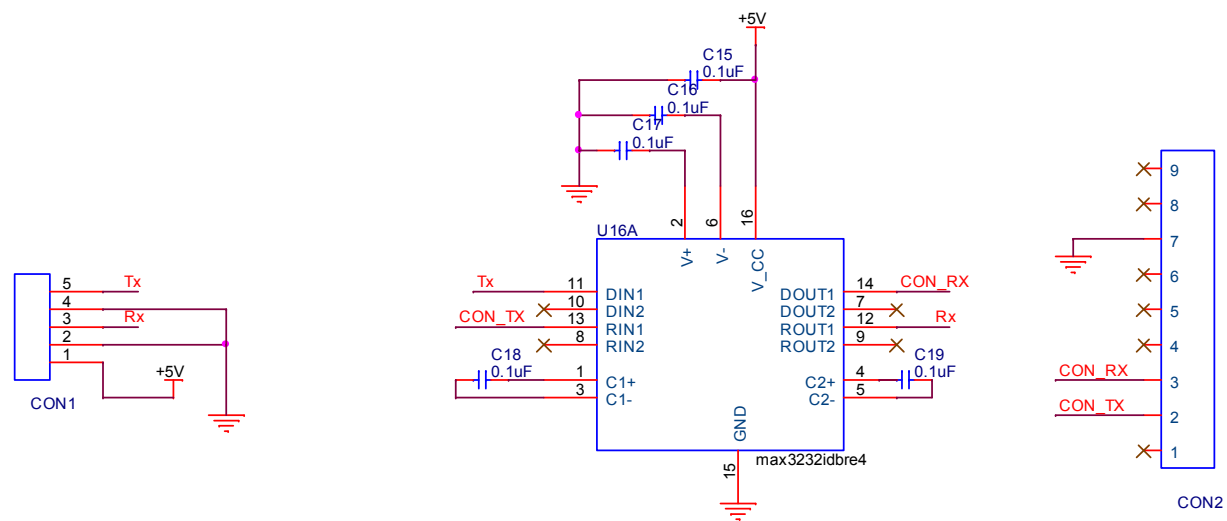
Title		
ER1_FRONT_DISPLAY		
Size	Document Number	Rev
A4		0
Date:	Monday, March 12, 2007	Sheet 4 of 9

3.2.1.8. Rear display Part



Title		
ERS_LCD_REAR_DISPLAY		
Size	Document Number	Rev
A4		0
Date:	Monday, March 12, 2007	Sheet 7 of 9

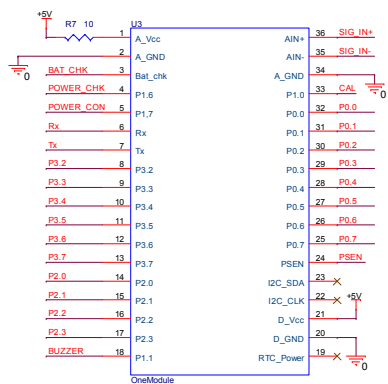
3.2.1.9. RS232 Part



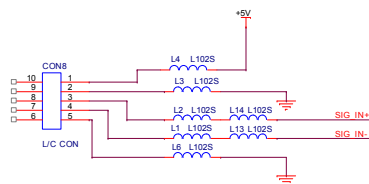
Title		
ER RS 232 CIRCUIT		
Size	Document Number	Rev
A4		0
Date:	Wednesday , May 30, 2007	Sheet 9 of 9

3.2.2. LED Version

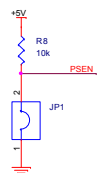
3.2.2.1. Main



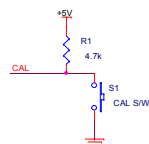
MODULE CONNECTOR PART



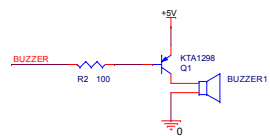
LOADCELL PART



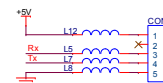
PROGRAM PART



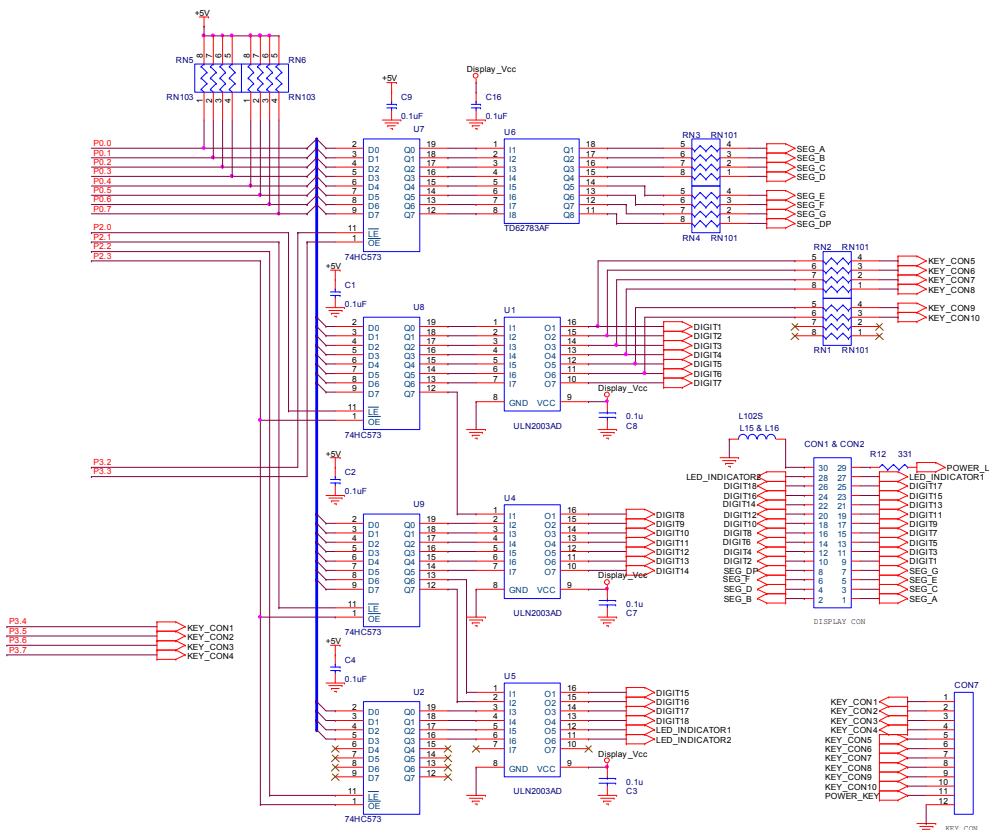
CAL PART



BUZZER PART



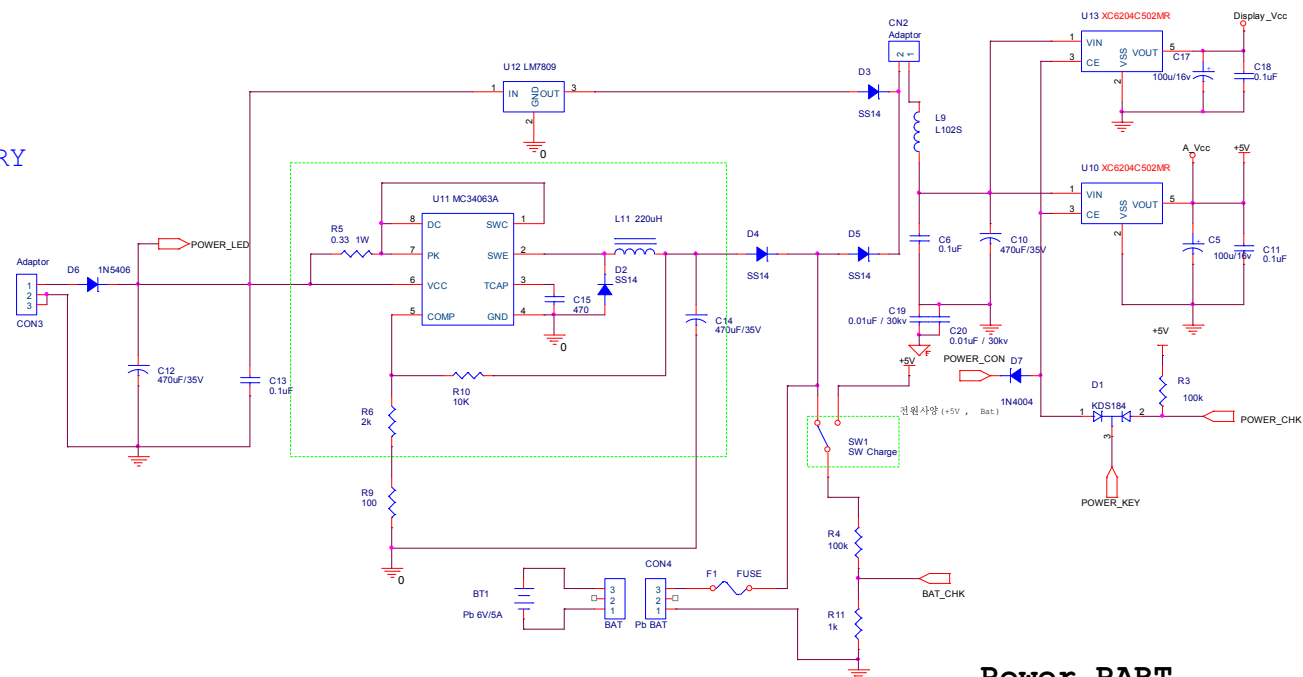
RS232 DRIVER PART



Title		
ER_LED TYPE MAIN CIRCUIT		
Size	Document Number	Rev
A3	6100-PER-0100	A
Date	Wednesday, June 13, 2007	Sheet 2 of 6

3.2.2.2. Power part

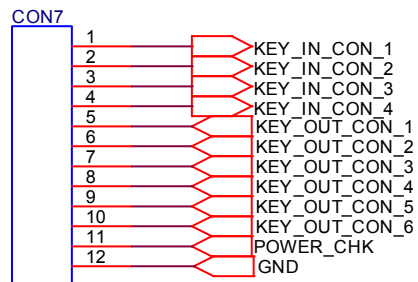
LED USE
RECHARGEABLE BATTERY



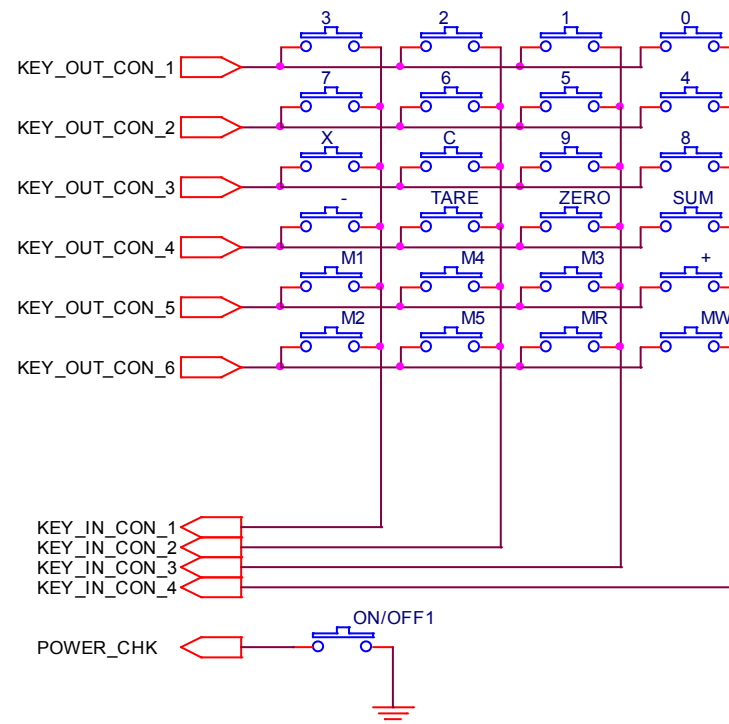
Power PART

Title		
ERS LED POWER CIRCUIT DIAGRAM		
Size	Document Number	Rev
A3	6100-PER-0100	A
Date:	Wednesday, June 13, 2007	Sheet 3 of 6

3.2.2.3. Key Part



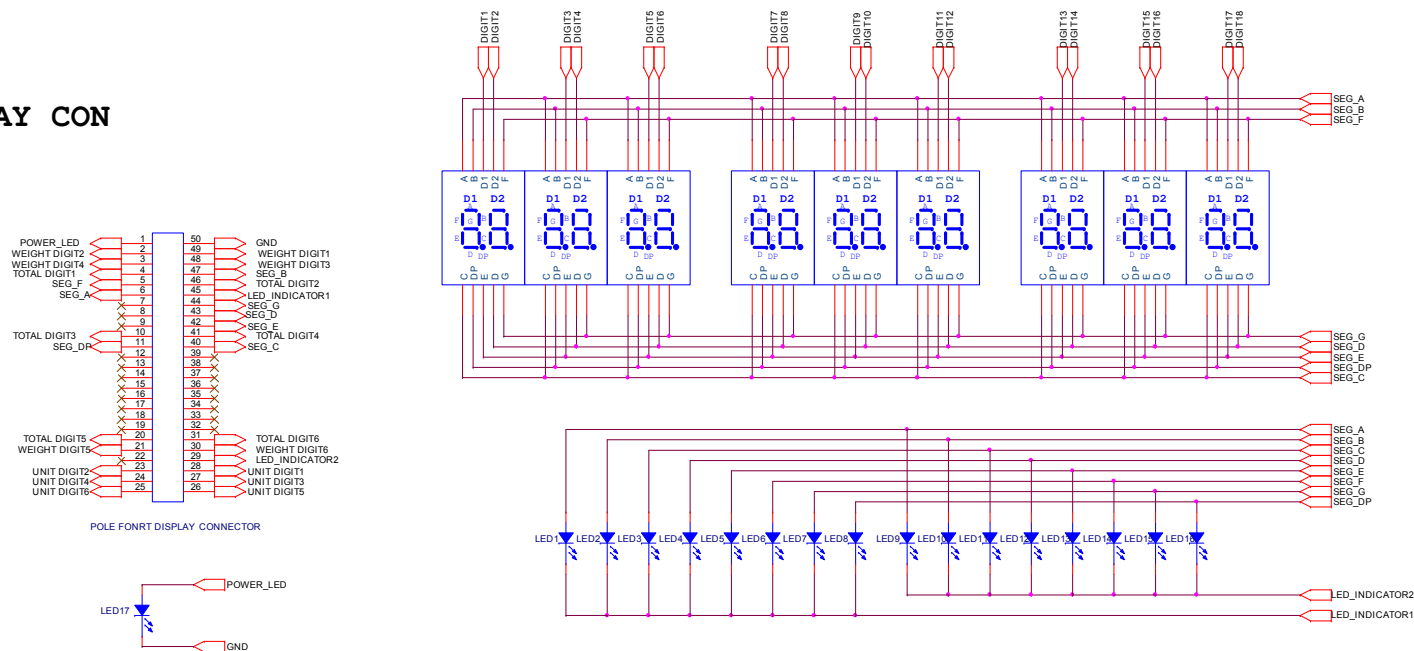
ER Service Manual



Title		
ER KEY CIRCUIT		
Size A	Document Number 6130-PER-0001-0	Rev 0
Date:	Wednesday, June 13, 2007	Sheet 5 of 6

3.2.2.4. Pole front display Part

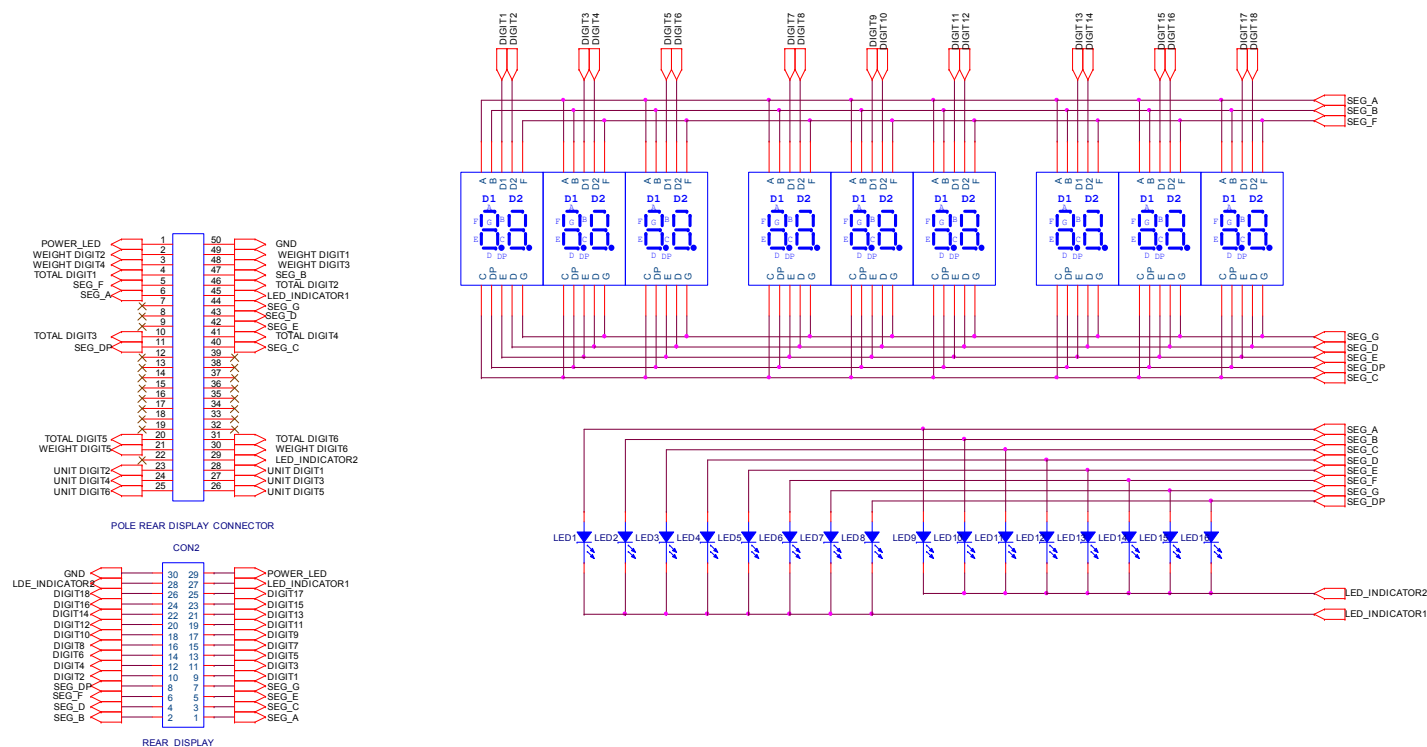
DISPLAY CON



Title		
ER LED POLE FRONT DISPLAY		
Size	Document Number	Rev
A3	6110-PER-0006	A
Date:	Wednesday, June 13, 2007	Sheet 1 of 1

3.2.2.5. Pole rear display Part

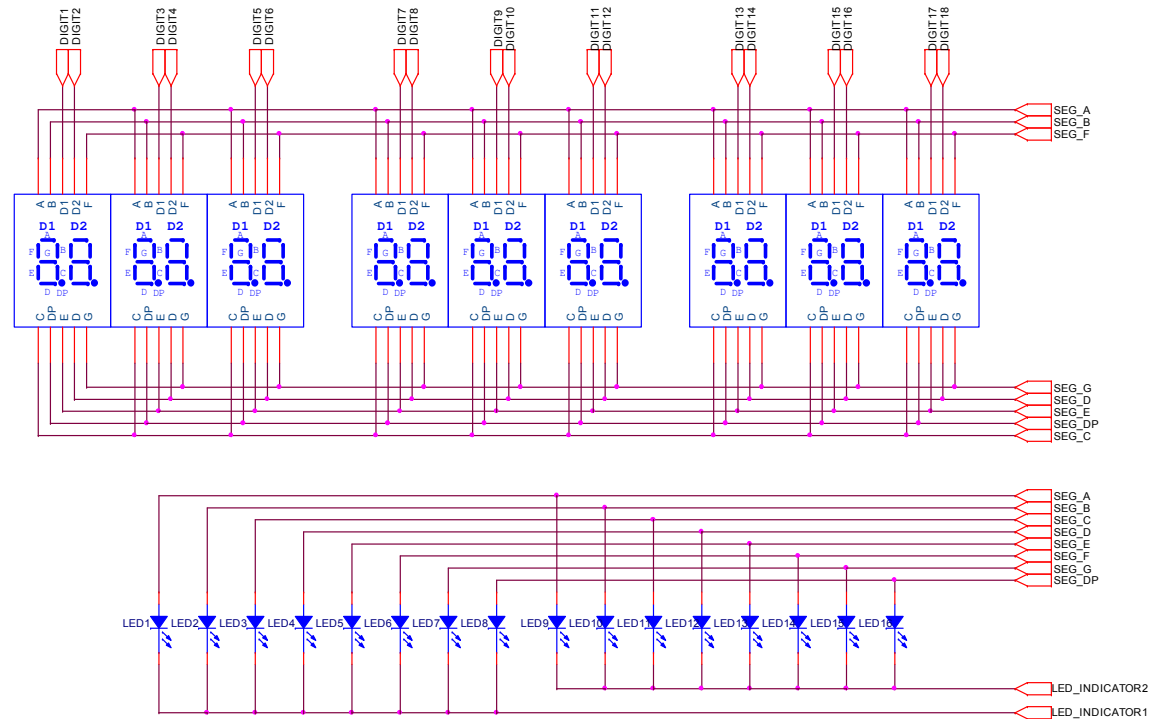
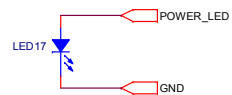
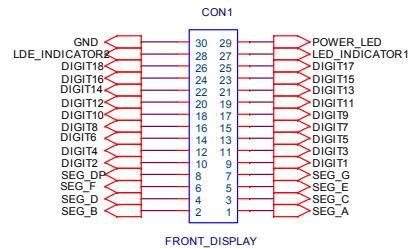
DISPLAY CON



Title		
ER LED POLE REAR DISPLAY		
Size	Document Number	Rev
A3	6110-PER-0005	A
Date:	Wednesday, June 13, 2007	Sheet 1 of 1

3.2.2.6. Front display Part

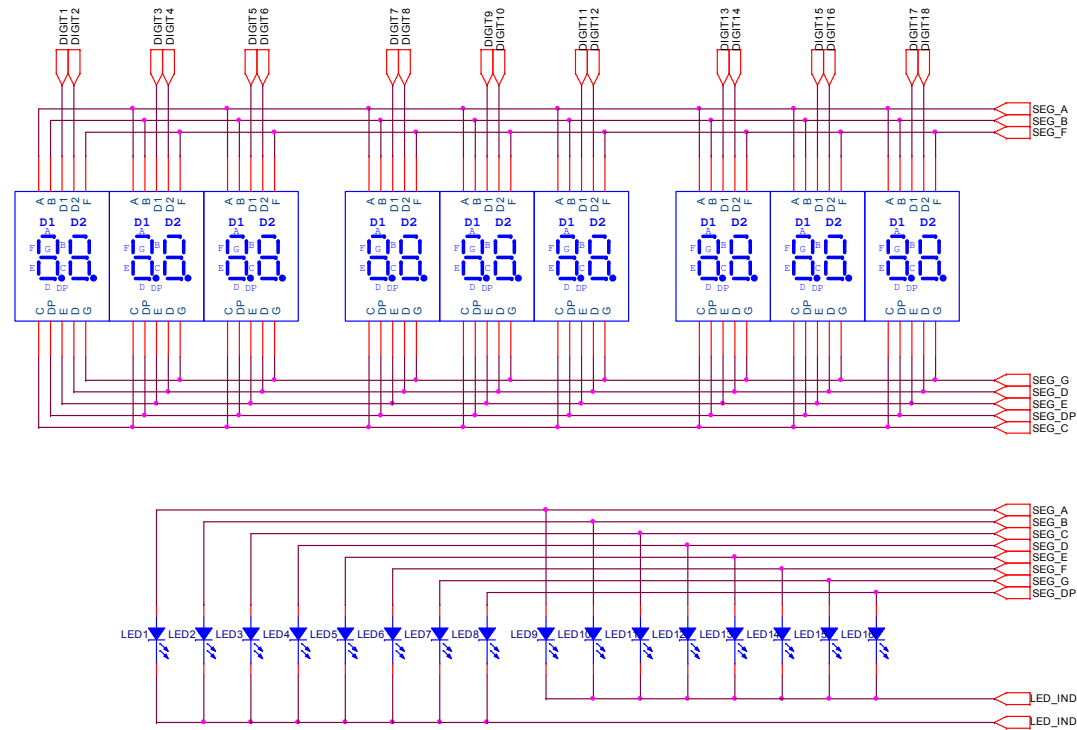
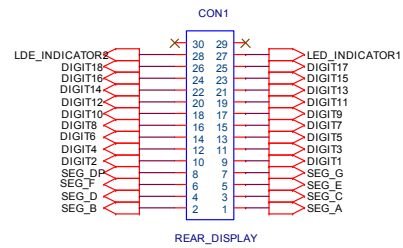
DISPLAY CON



Title		
ERS_LED FRONT DISPLAY		
Size	Document Number	Rev
B	6110-PER-0100	A
Date:	Wednesday, June 13, 2007	Sheet 1 of 6

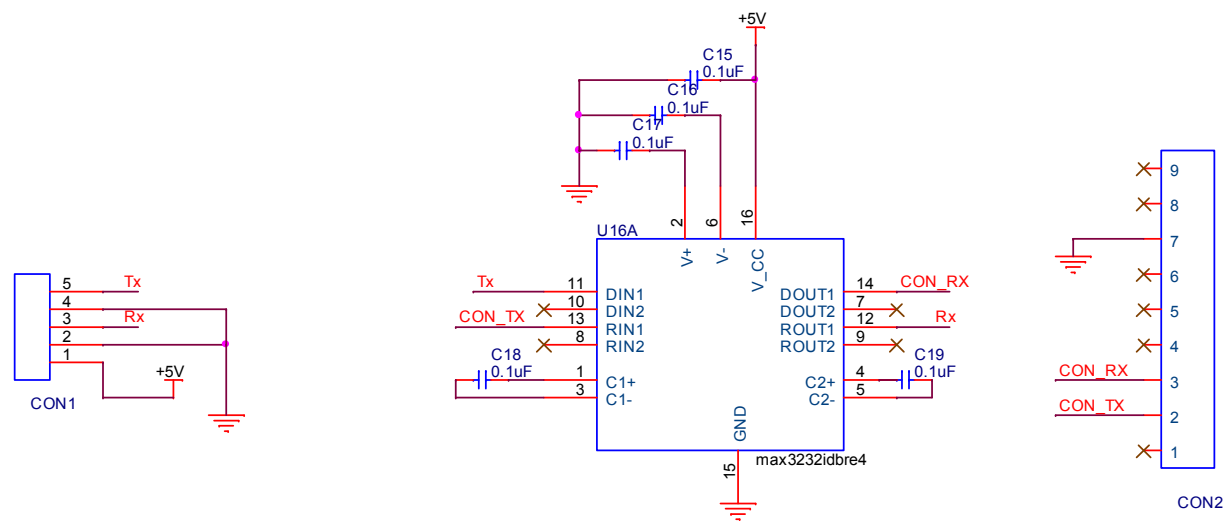
3.2.2.7. Rear display Part

DISPLAY CON



Title ER LED REAR DISPLAY		
Size B	Document Number 6110-PER-0200	Rev A
Date: Wednesday, June 13, 2007	Sheet 4	of 6

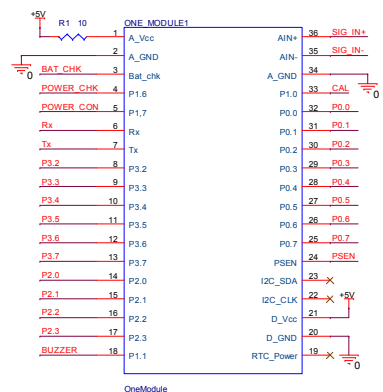
3.2.2.8. RS232 Part



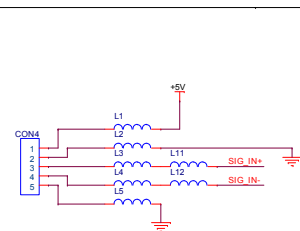
Title		
ER RS 232 CIRCUIT		
Size A4	Document Number	Rev 0
Date:	Wednesday , May 30, 2007	Sheet 9 of 9

3.2.3.VFD Version

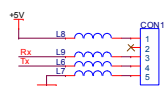
3.2.3.1. Main



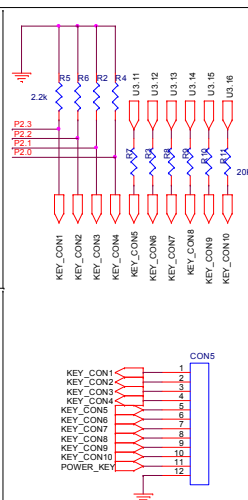
MODULE CONNECTOR PART



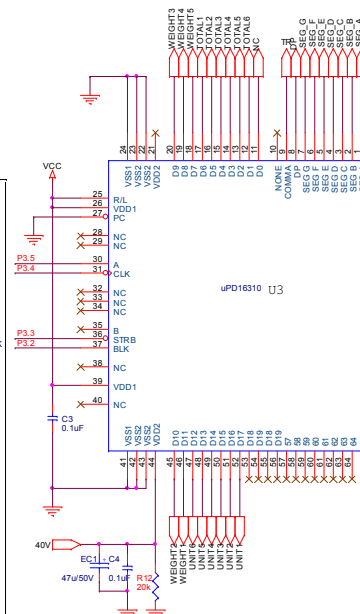
L/C Connector



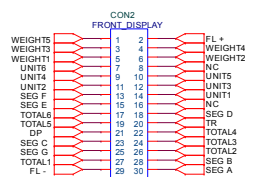
RS232 DRIVER
PART



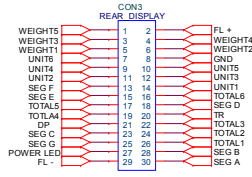
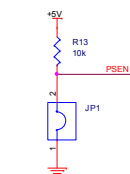
KEY CONNECTOR



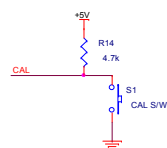
VFD DRIVER PART



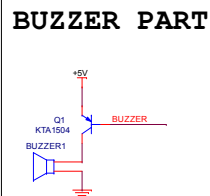
FRONT DISPLAY
PART

REAR DISPLAY
PART

PROGRAM
PART



CAL PART

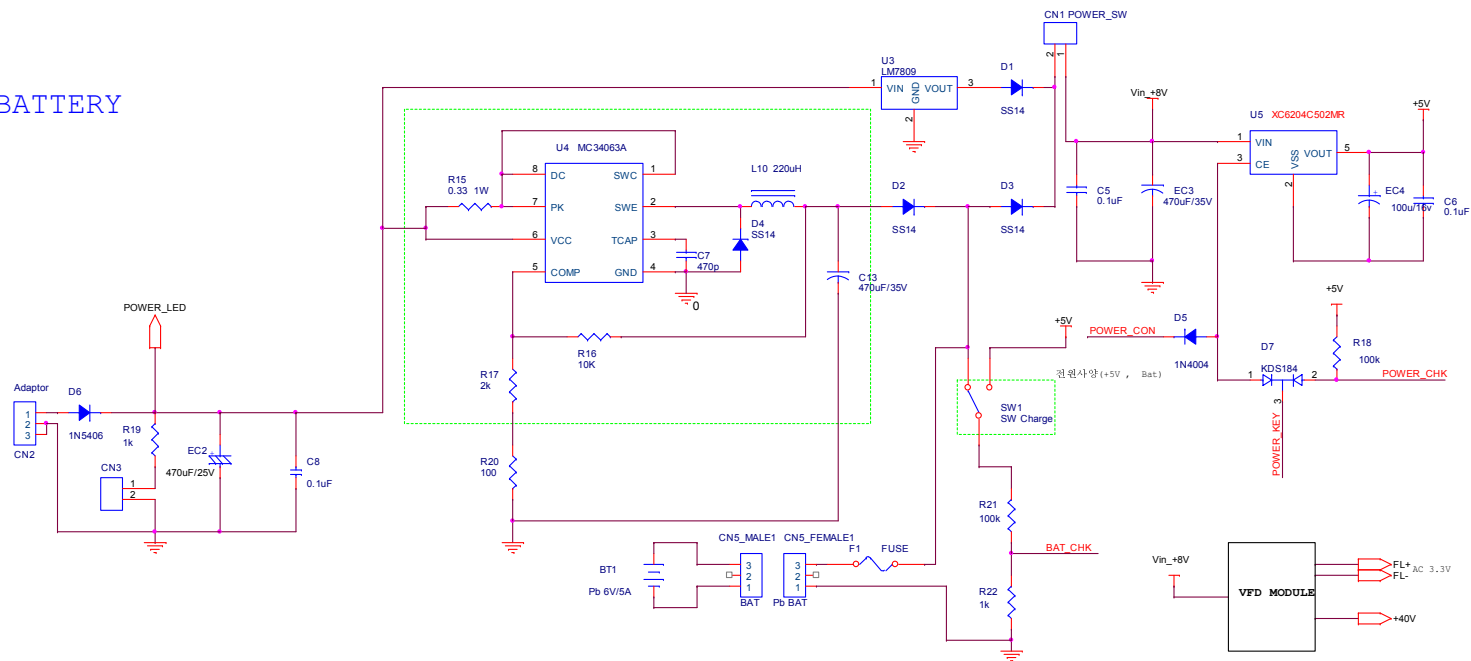


BUZZER PART

Title			
ER VFD MAIN CIRCUIT			
Size A3	Document Number		Re A
	6100-PER-0010		
Date:	Wednesday, June 27, 2007	Sheet	3 of 8

3.2.3.2. Power part

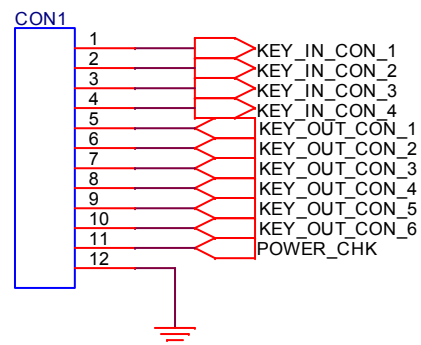
VFD USE
RECHARGEABLE BATTERY



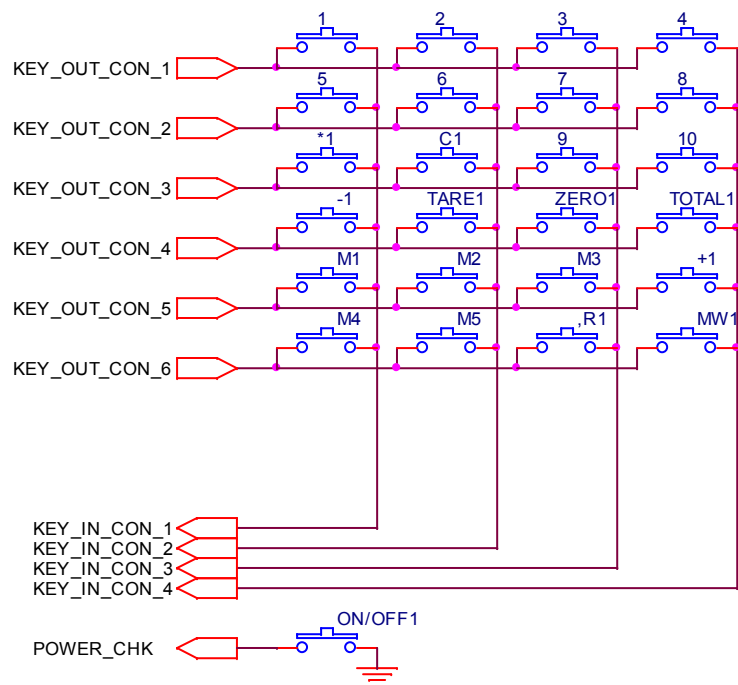
Power PART

PILOT DESIGN			
Title			
VFD POWER CIRCUIT DIAGRAM			
Size	Document Number	Rev	
A3	6100-PER-0010-0	1	
Date:	Wednesday, June 13, 2007	Sheet	4 of 8

3.2.3.3. Key Part

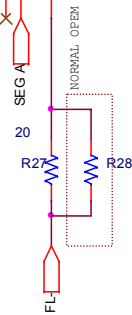
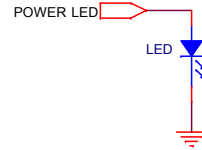
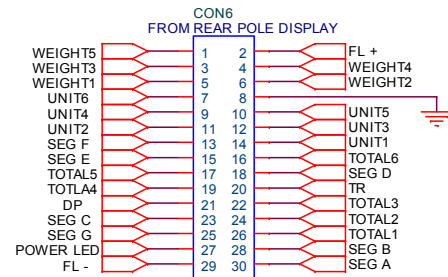
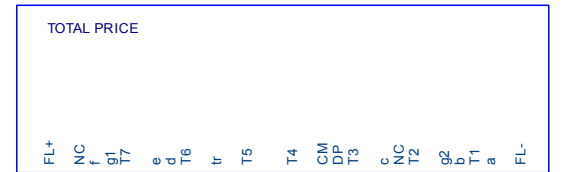
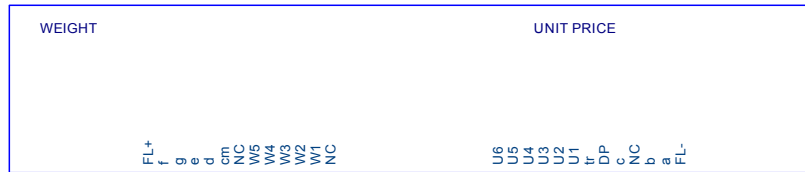


ER Service Manual



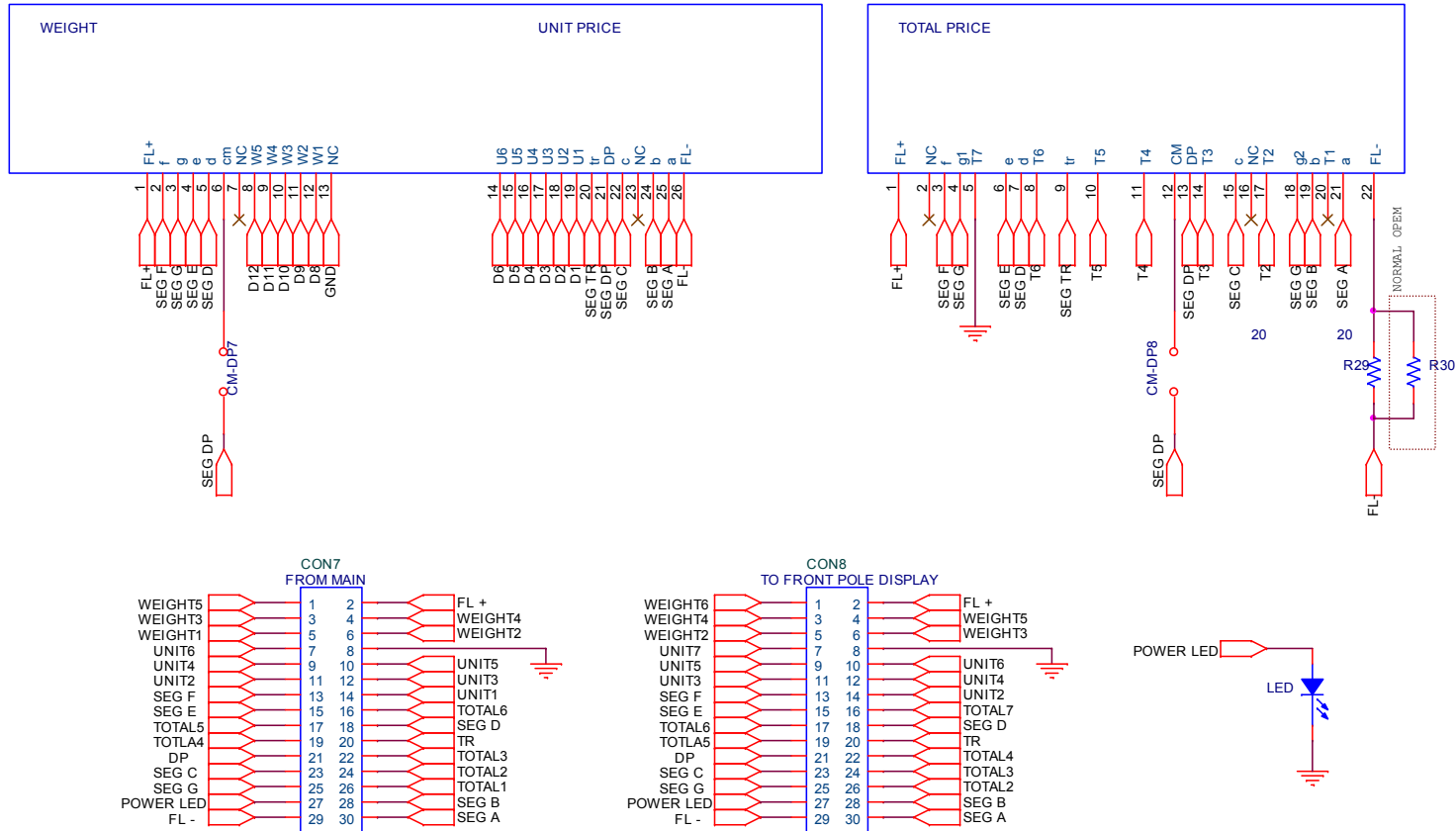
Title		
ER KEY CIRCUIT		
Size A	Document Number 6130-PER-0001-0	Rev 0
Date:	Friday, March 16, 2007	Sheet 1 of 8

3.2.3.4. Pole front display Part



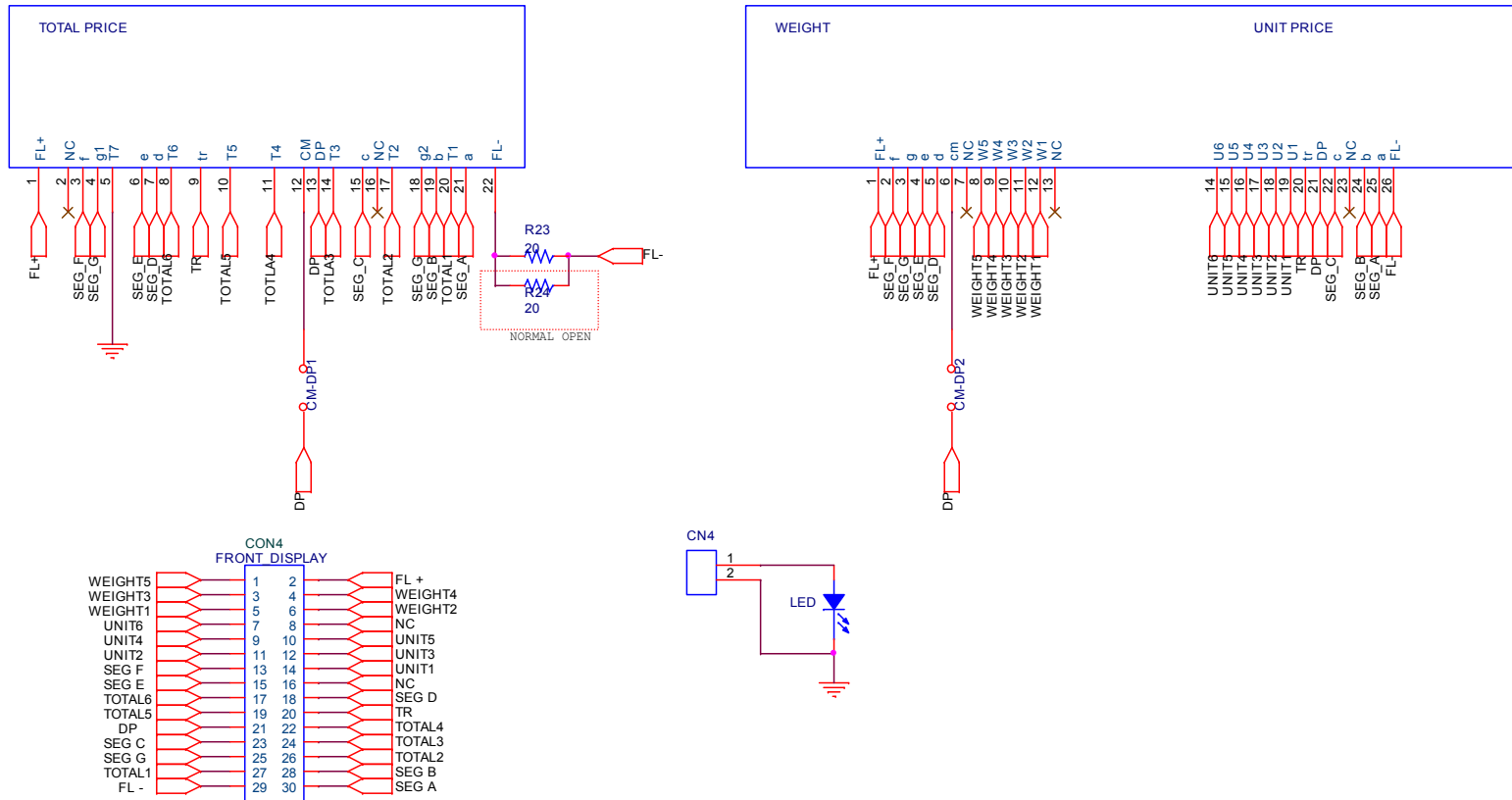
Title		
ER_VFD FRONT POLE DISPLAY		
Size	Document Number	Rev
A4	6110-PER-0030	A
Date:	Thursday, June 14, 2007	Sheet 7 of 8

3.2.3.5. Pole rear display Part



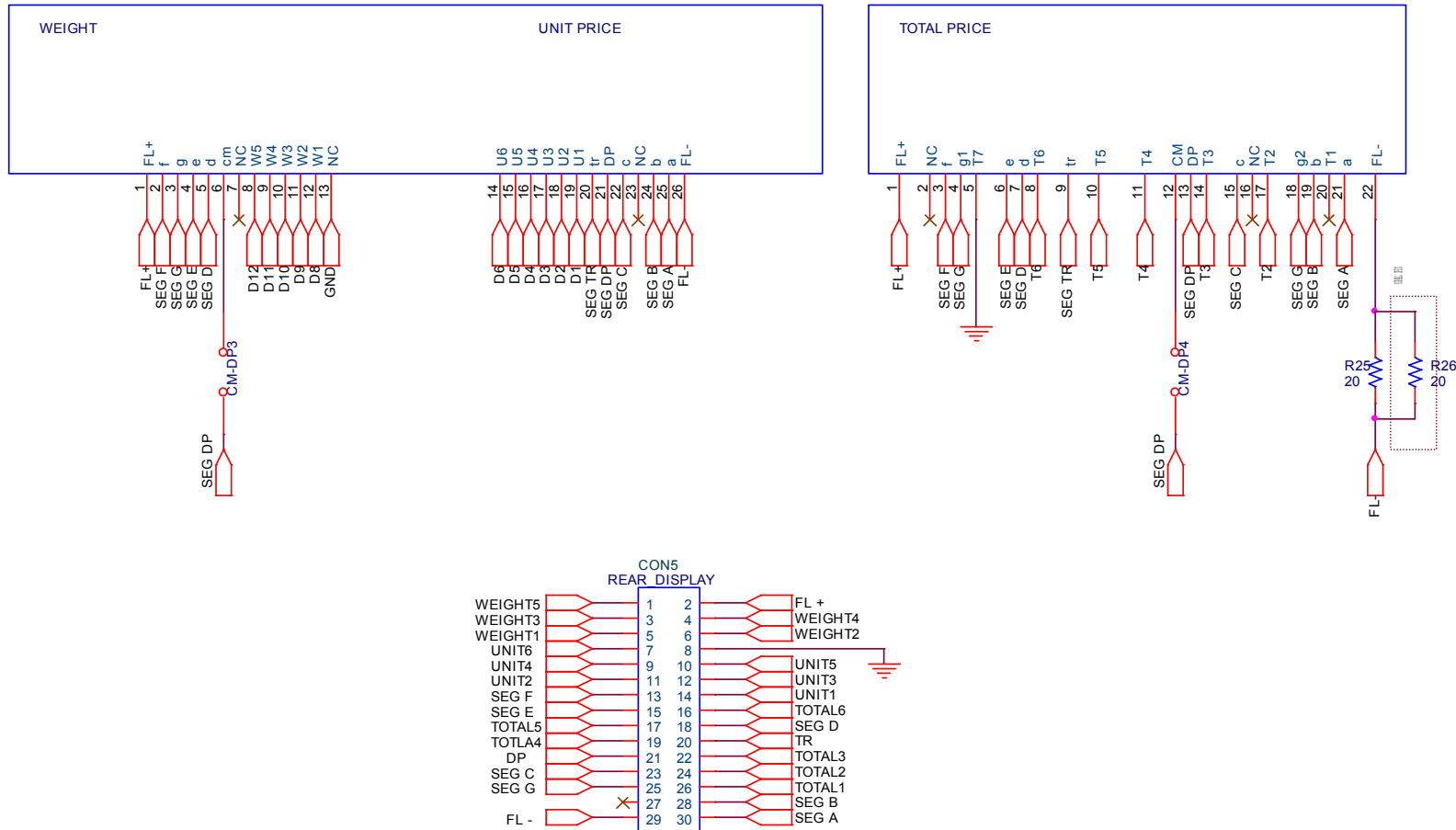
Title		
ER POLE REAR DISPLAY CIRCUIT		
Size	Document Number	Rev
A4	6110-PER-0030	A
Date:	Thursday, June 14, 2007	Sheet 8 of 8

3.2.3.6. Front display Part



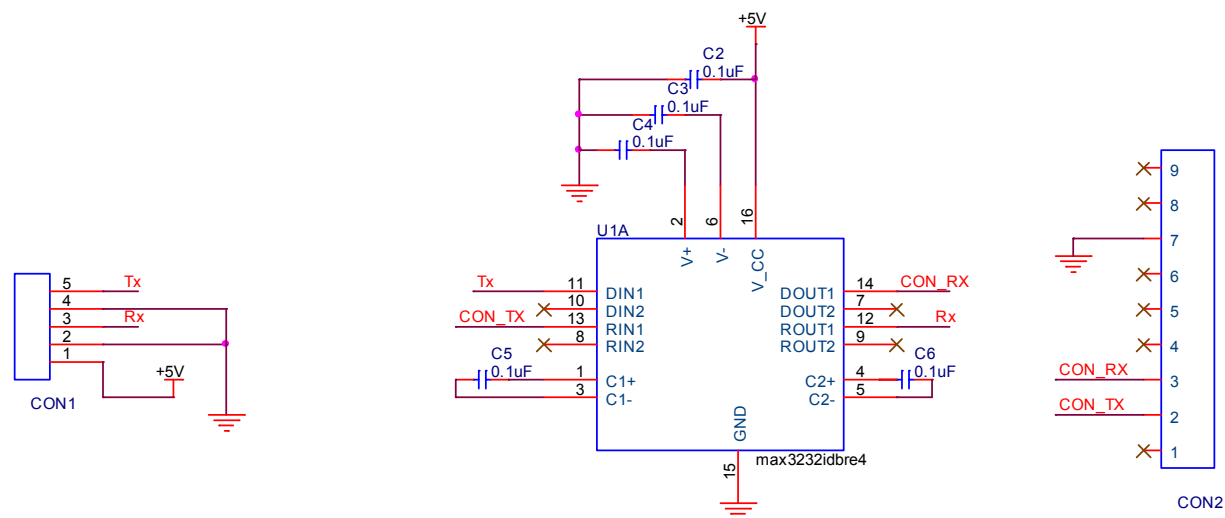
Title		
VFD DISPLAY CIRCUIT(FRONT)		
Size	Document Number	Rev
A4	6110-PER-0010	A
Date:	Thursday, June 14, 2007	Sheet 5 of 8

3.2.3.7. Rear display Part



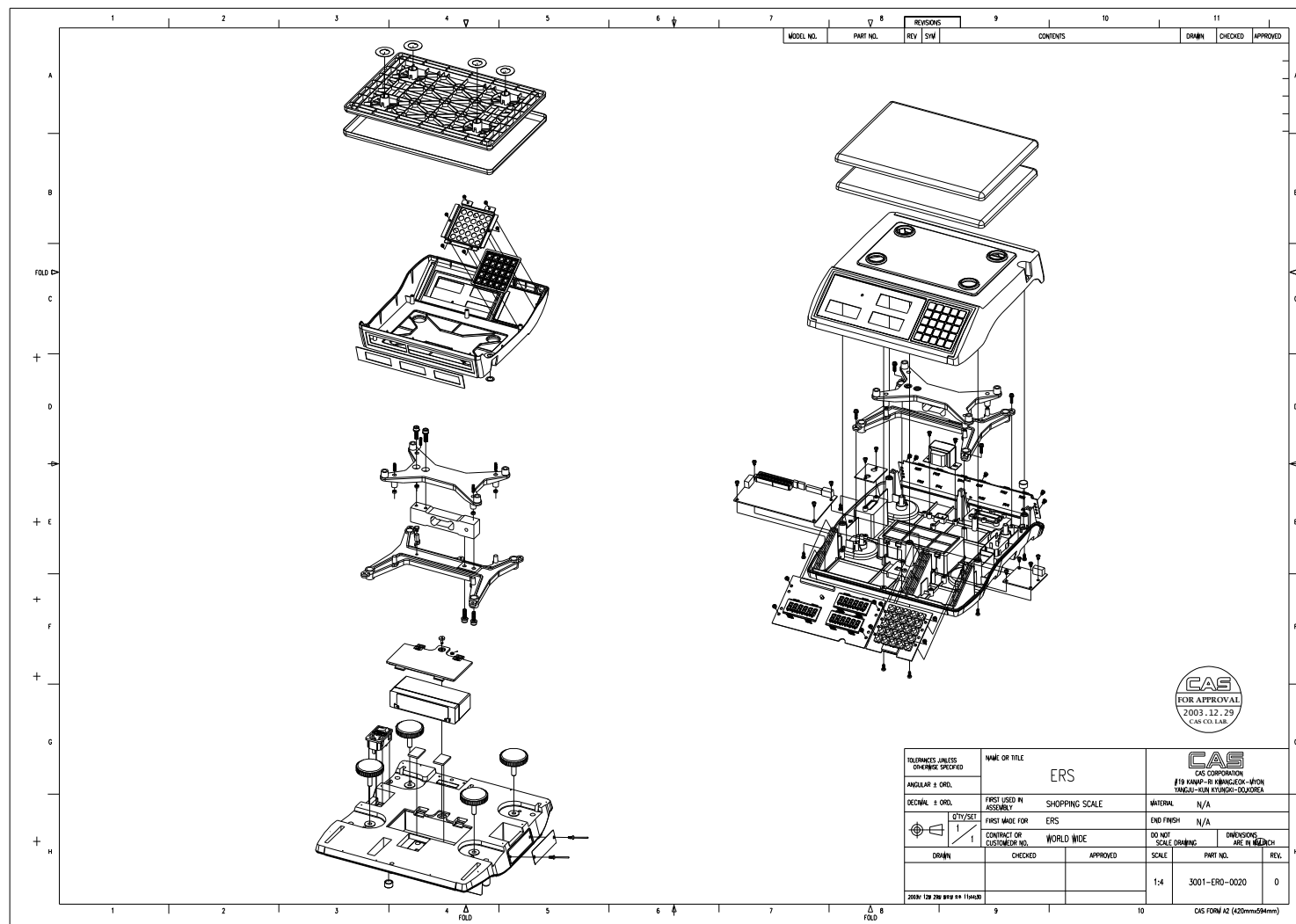
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ERS DISPLAY CIRCUIT(REAR)		
Size	Document Number	Rev
A4	6110-PER-0020	0
Date:	Thursday, June 14, 2007	Sheet 6 of 8

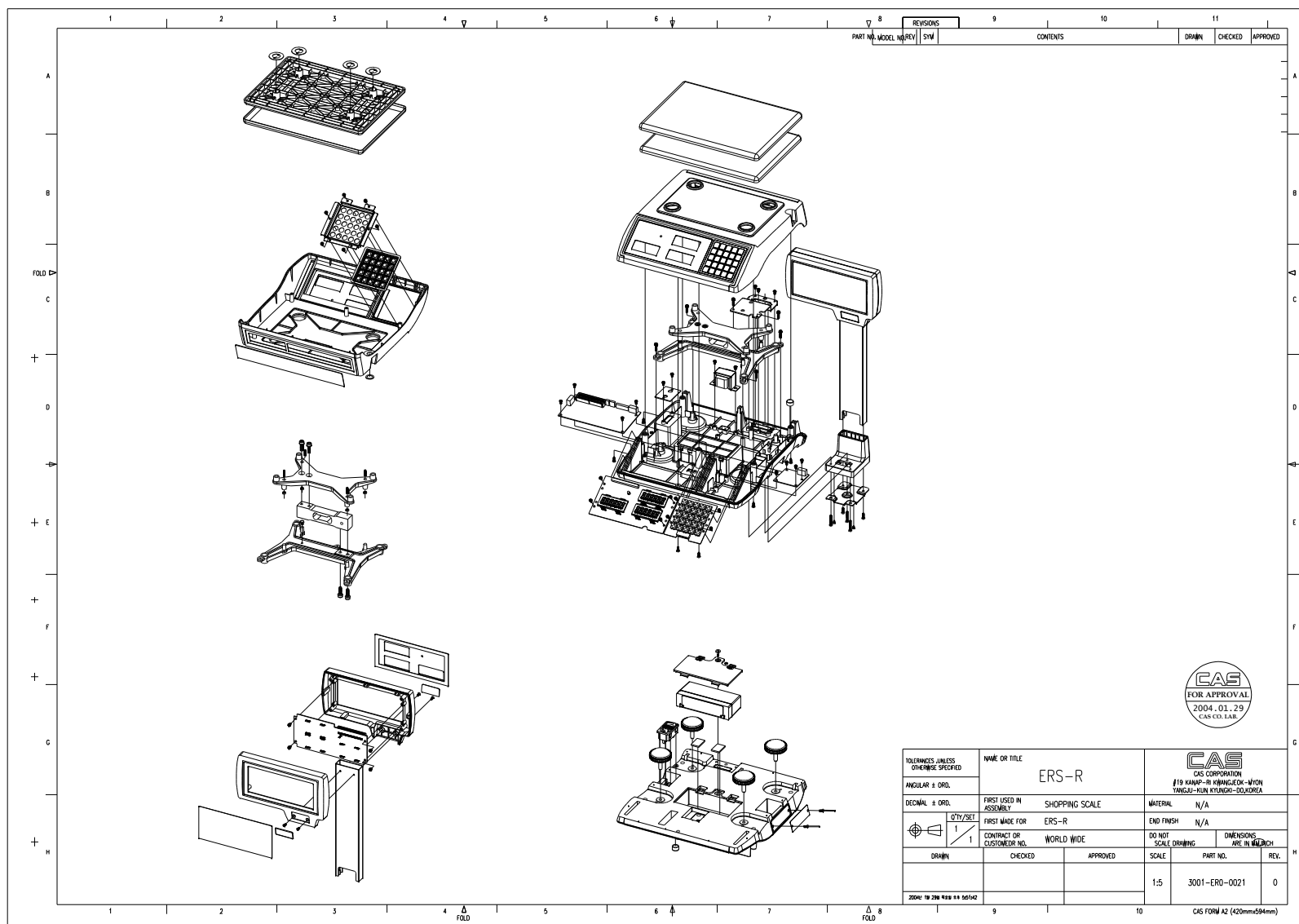
3.2.3.8. RS232 Part



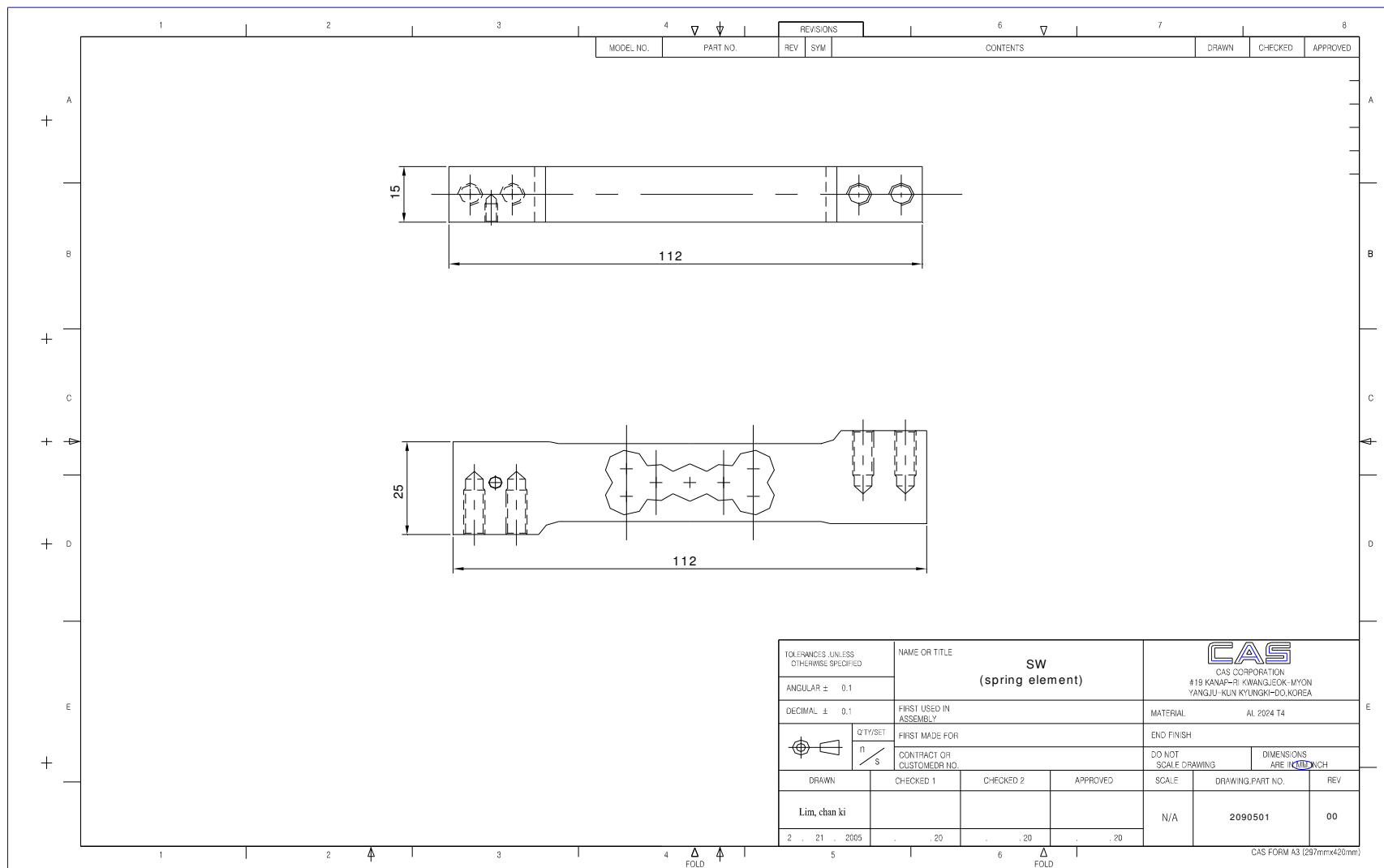
Title		
ER RS 232 CIRCUIT		
Size A4	Document Number 6528-PER-0001	Rev A
Date:	Thursday, June 14, 2007	Sheet 2 of 8

4. Exploded View





5. Load Cell drawing



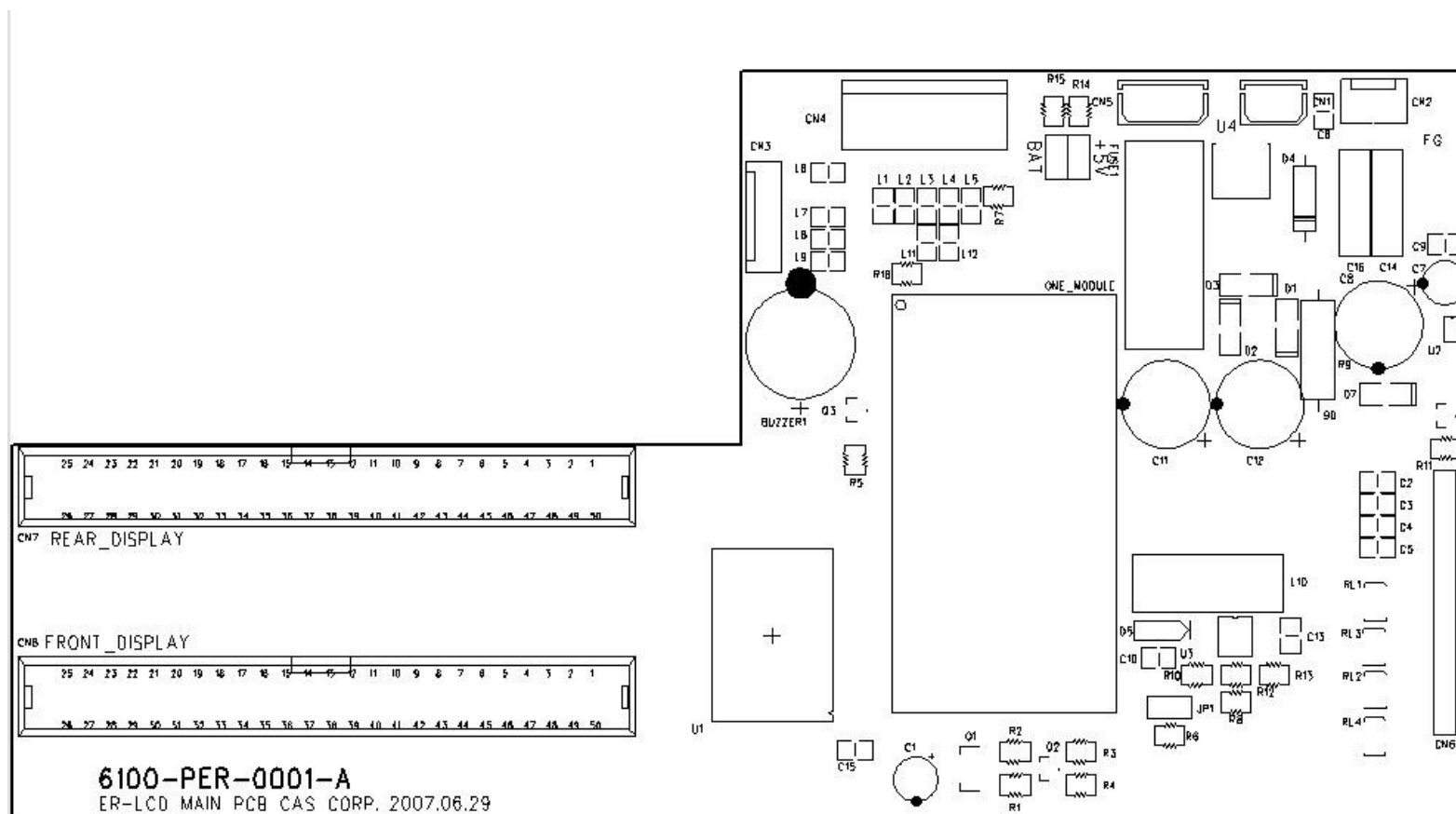
6. Part Location

6.1. LCD Version

6.1.1.1. Main PCB Part Location

- DRAWING NUMBER : 9000-ER0-0006

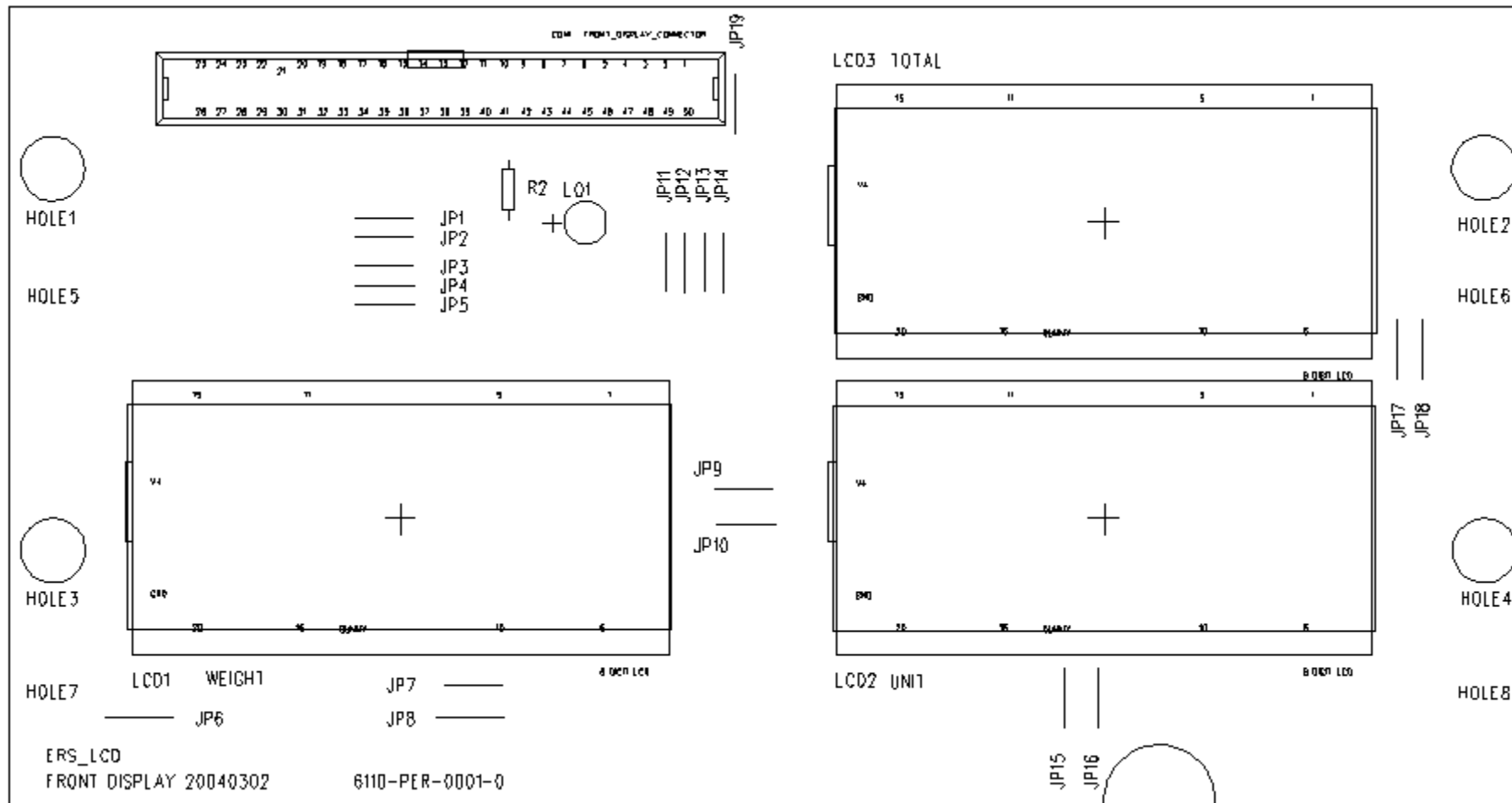
LCD MAIN



6.1.1.2. FRONT DISPLAY PCB Part Location

- DRAWING NUMBER : 9000-ERS-0007

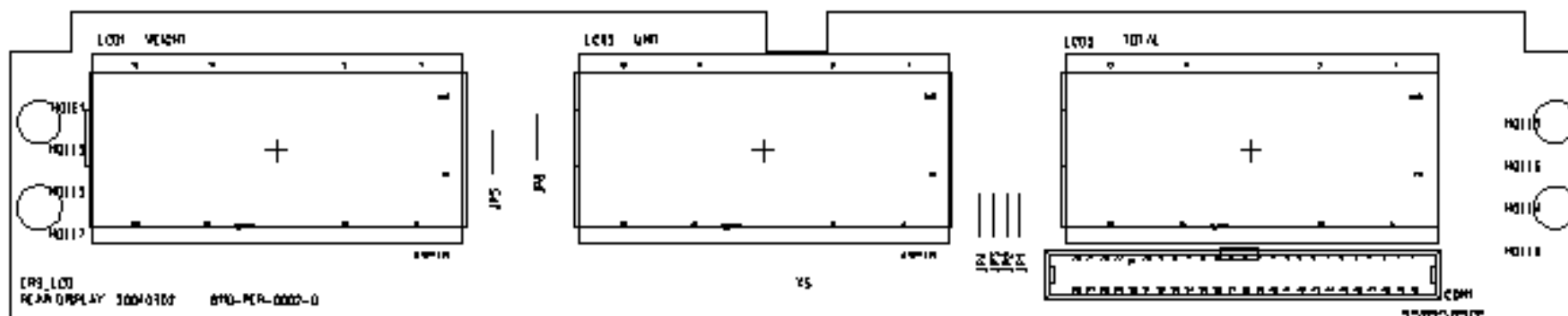
LCD FRONT DISPLAY



6.1.1.3. REAR DISPLAY PCB Part Location

- DRAWING NUMBER : 9000-ERS-0008

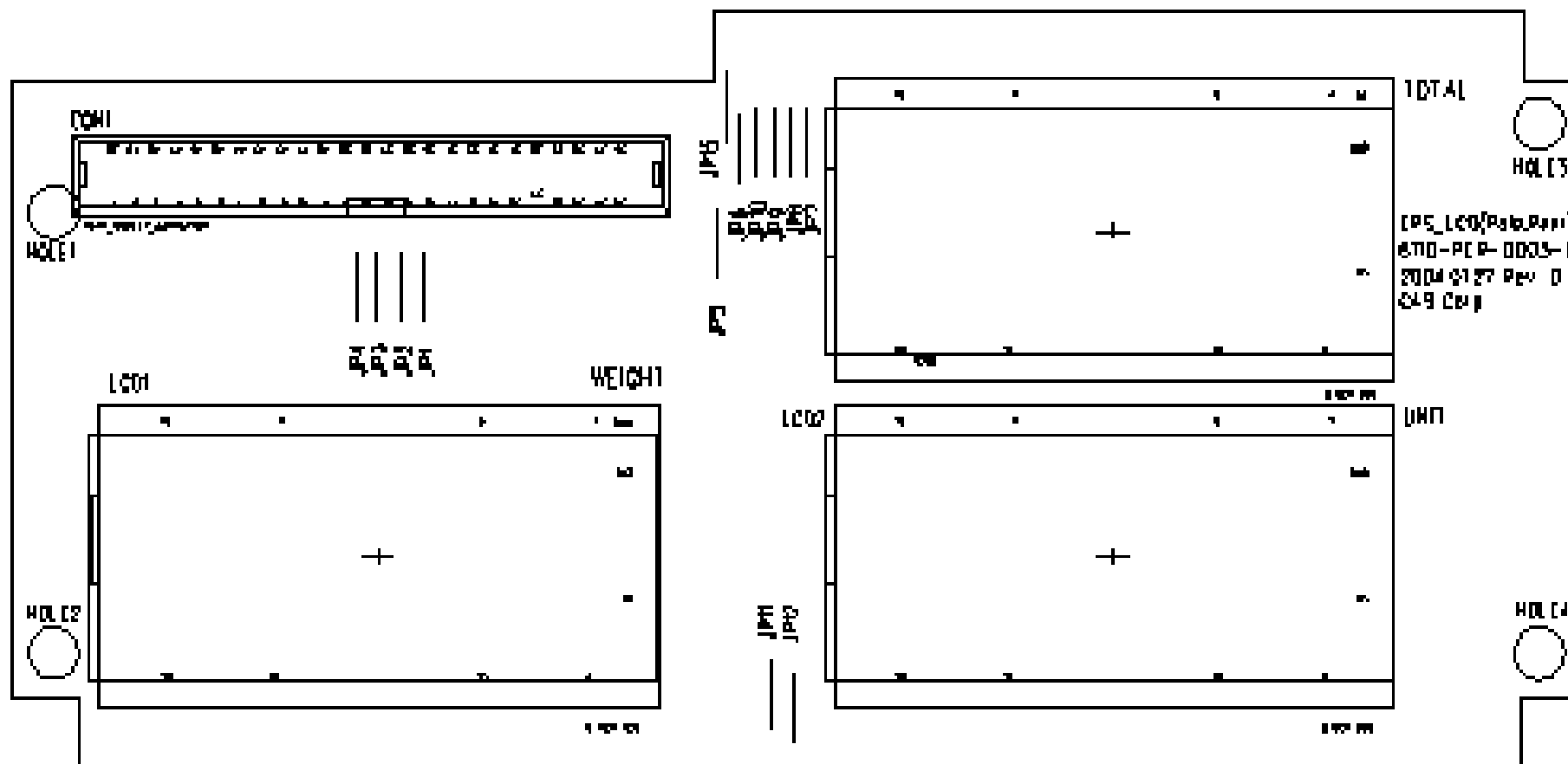
LCD REAR DISPLAY



6.1.1.4. POLE DISPLAY PCB Part Location

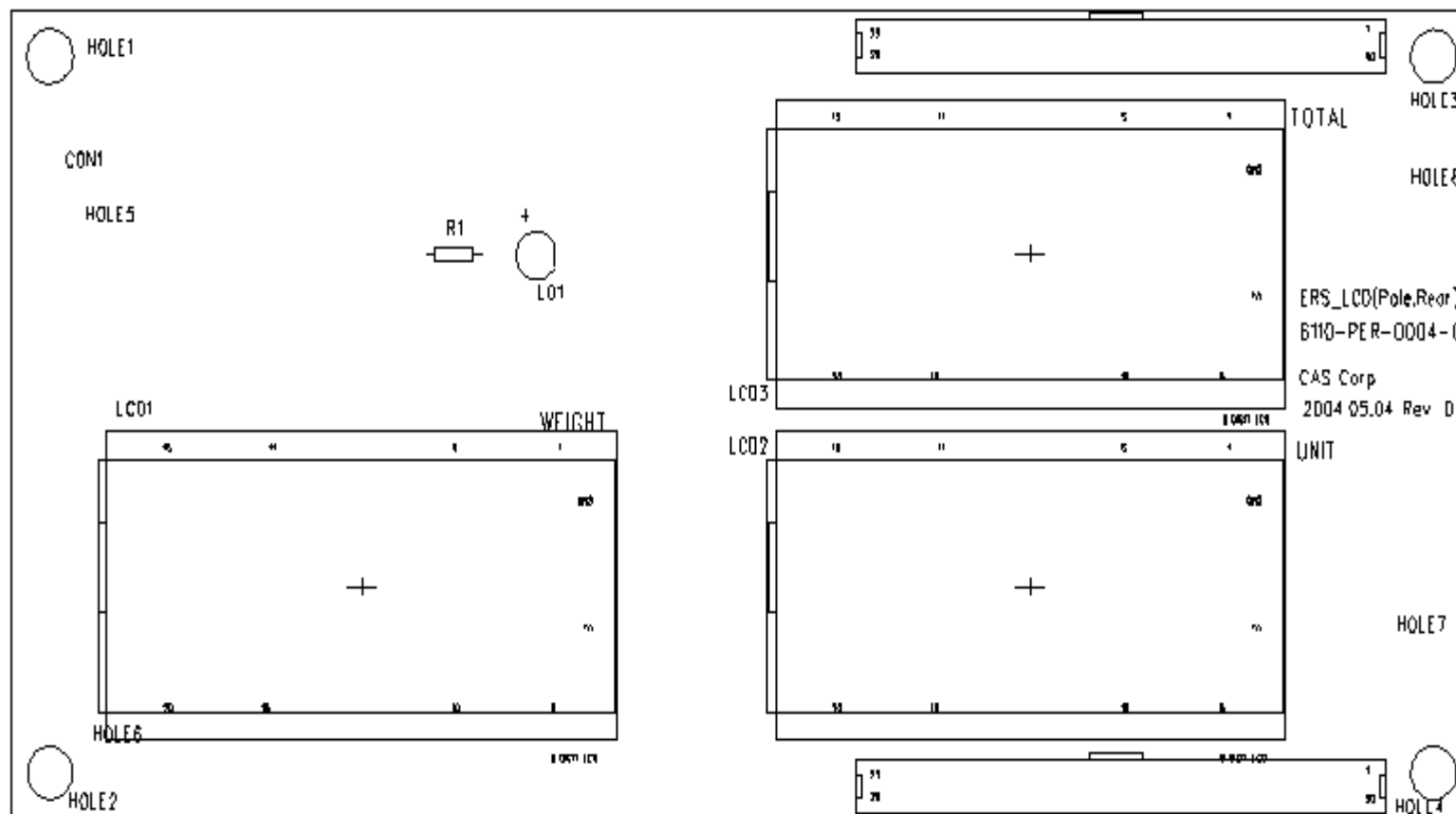
- DRAWING NUMBER : 9000-ERS-0009

LCD FRONT DISPLAY



- DRAWING NUMBER : 9000-ERS-0010

LCD REAR DISPLAY

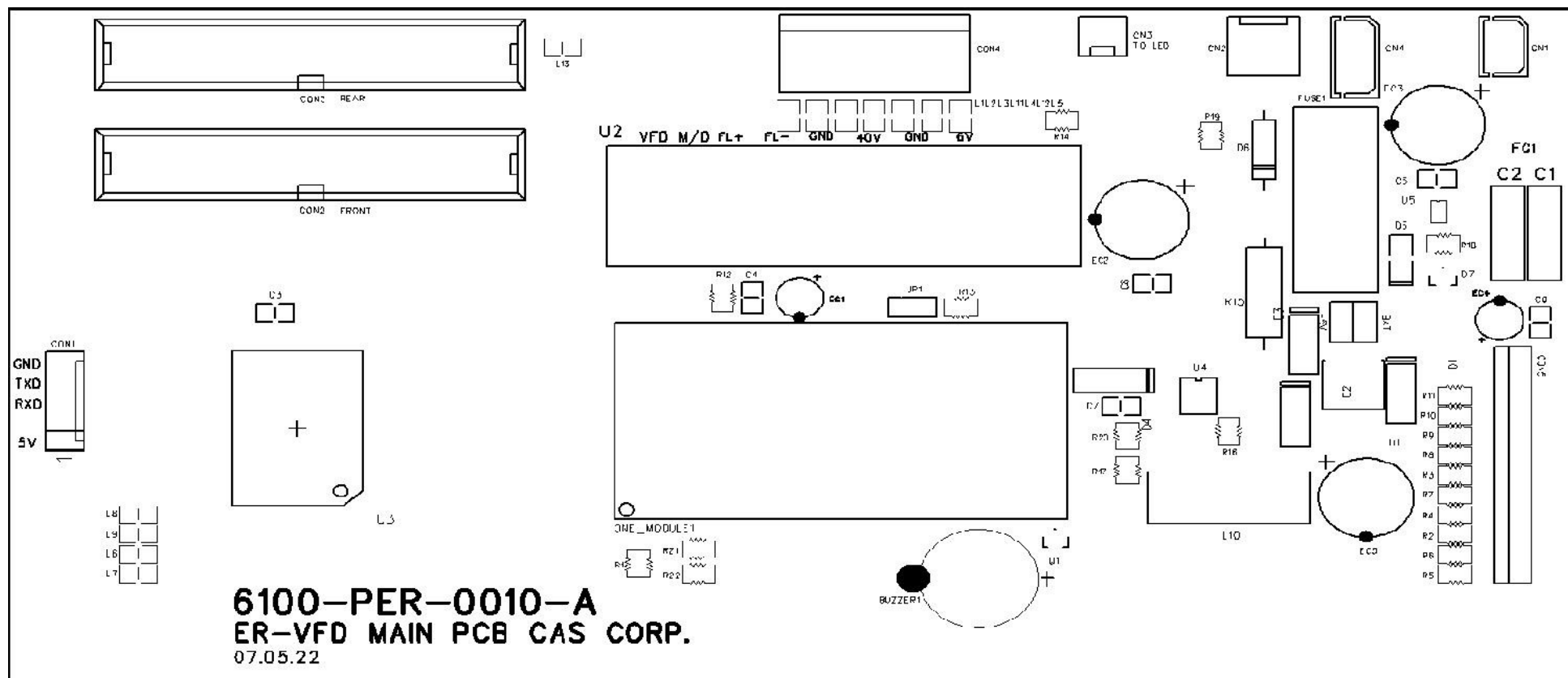


6.1.2. VFD Version

6.1.2.1. Main PCB Part Location

- **DRAWING NUMBER : 9000-ER1-0006**

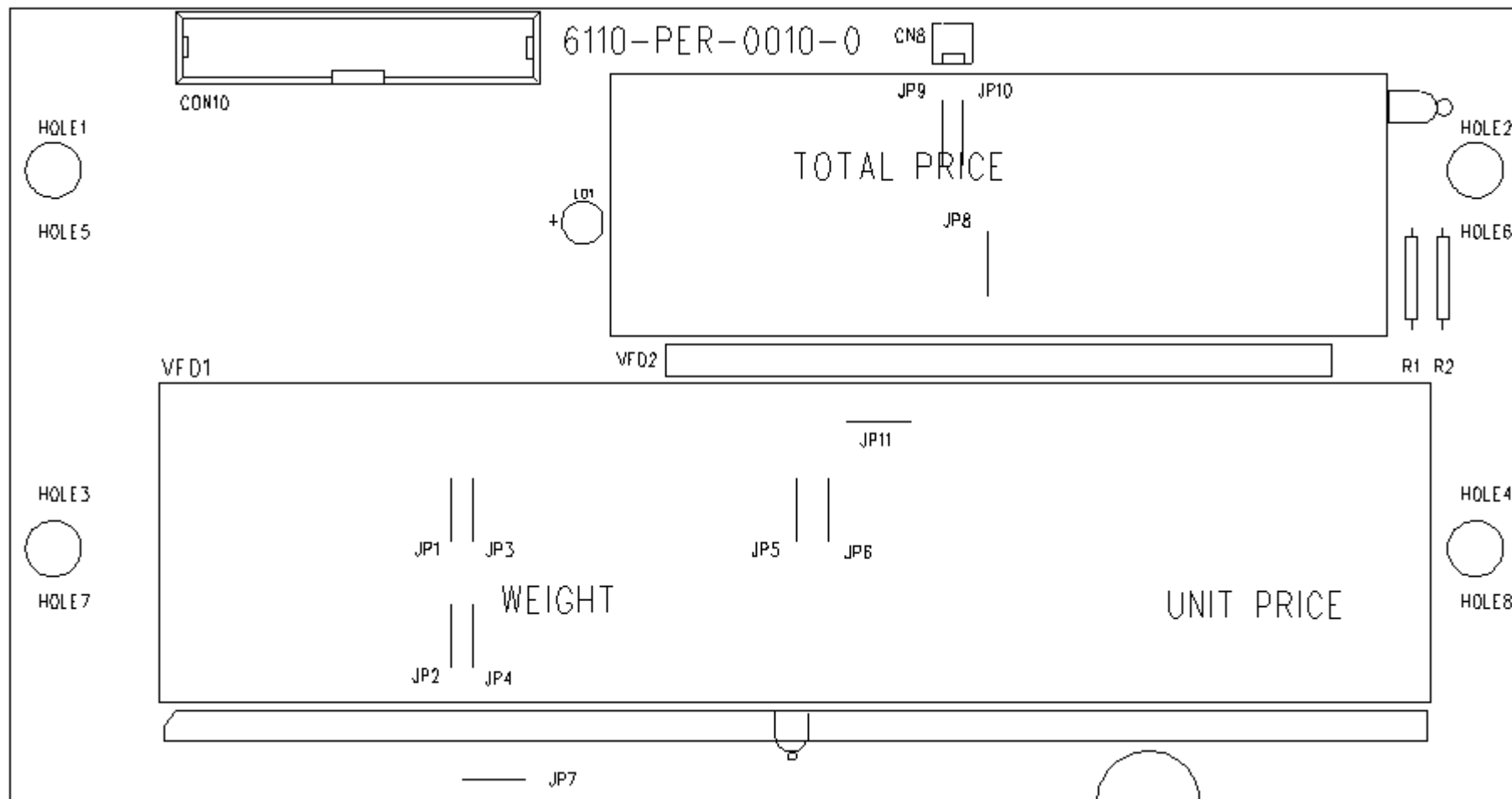
VFD MAIN



6.1.2.2. VFD FRONT DISPLAY PCB Part Location

- **DRAWING NUMBER : 9000-ER1-0007**

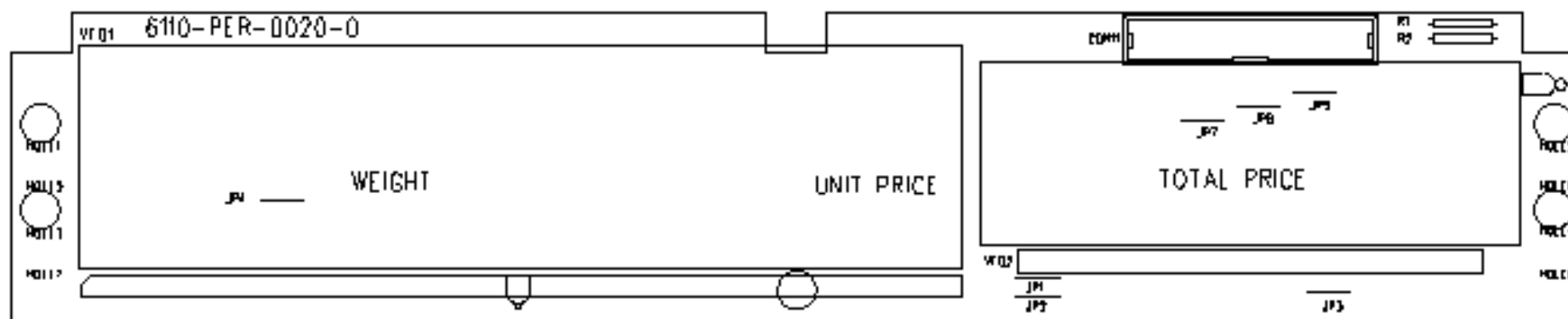
VFD FRONT DISPLAY



6.1.2.3. VFD REAR DISPLAY PCB Part Location

- DRAWING NUMBER : 9000-ER1-0008

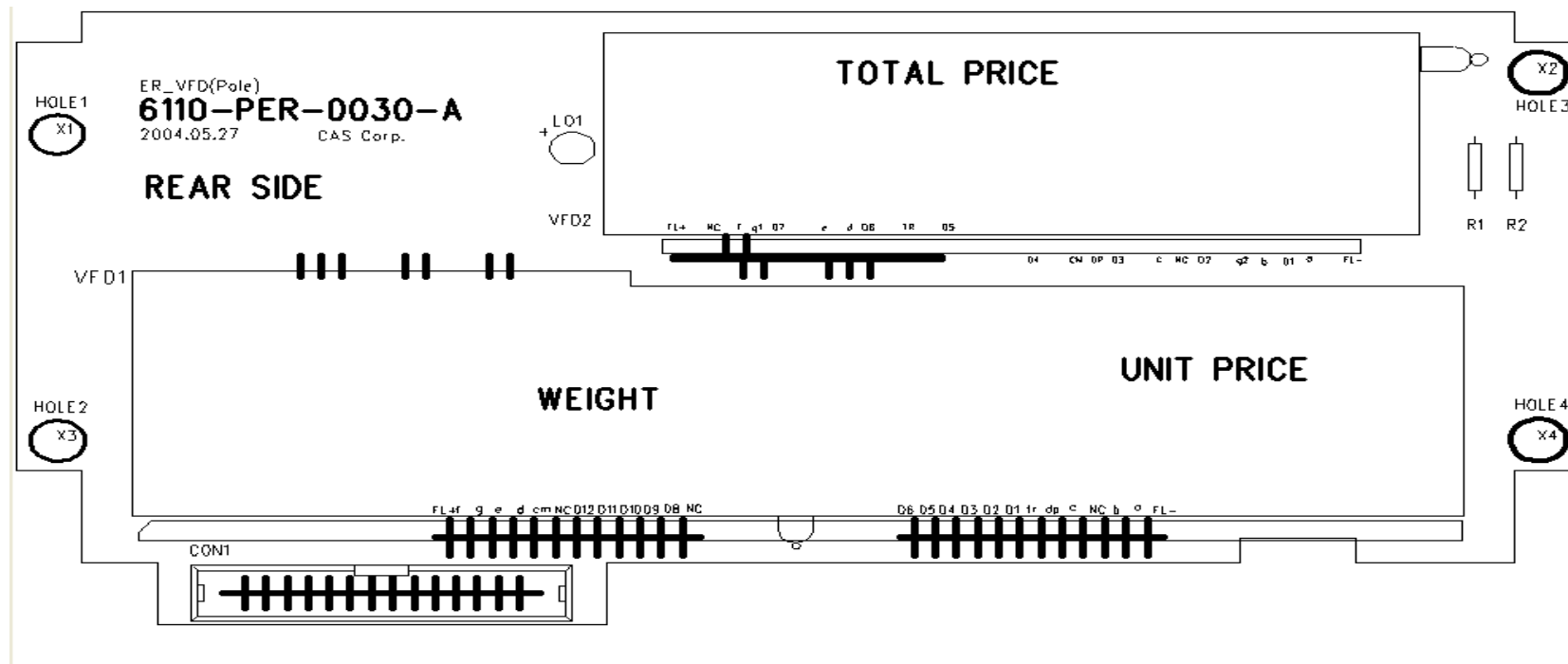
VFD REAR DISPLAY



6.1.2.4. POLE DISPLAY PCB Part Location

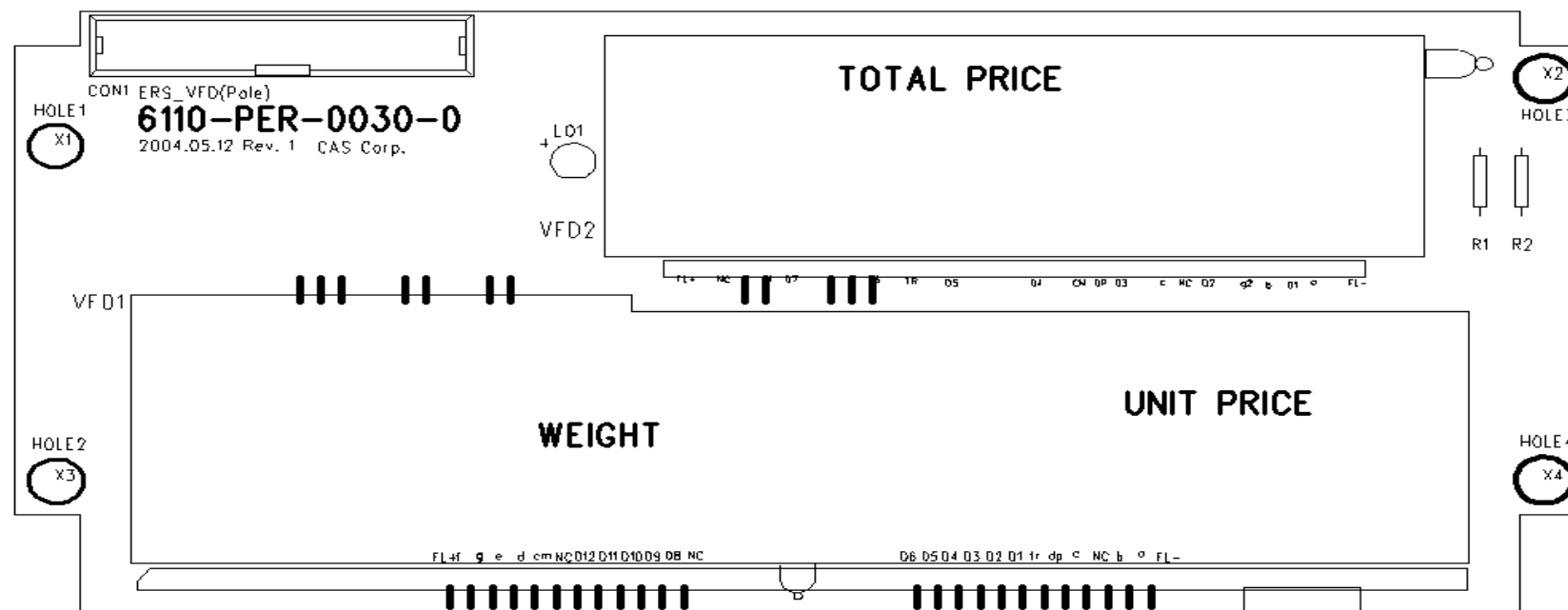
- **DRAWING NUMBER : 9000-ER1-0009**

VFD POLE DISPLAY TYPE #1



- DRAWING NUMBER : 9000-ER1-0010

VFD POLE DISPLAY TYPE #2

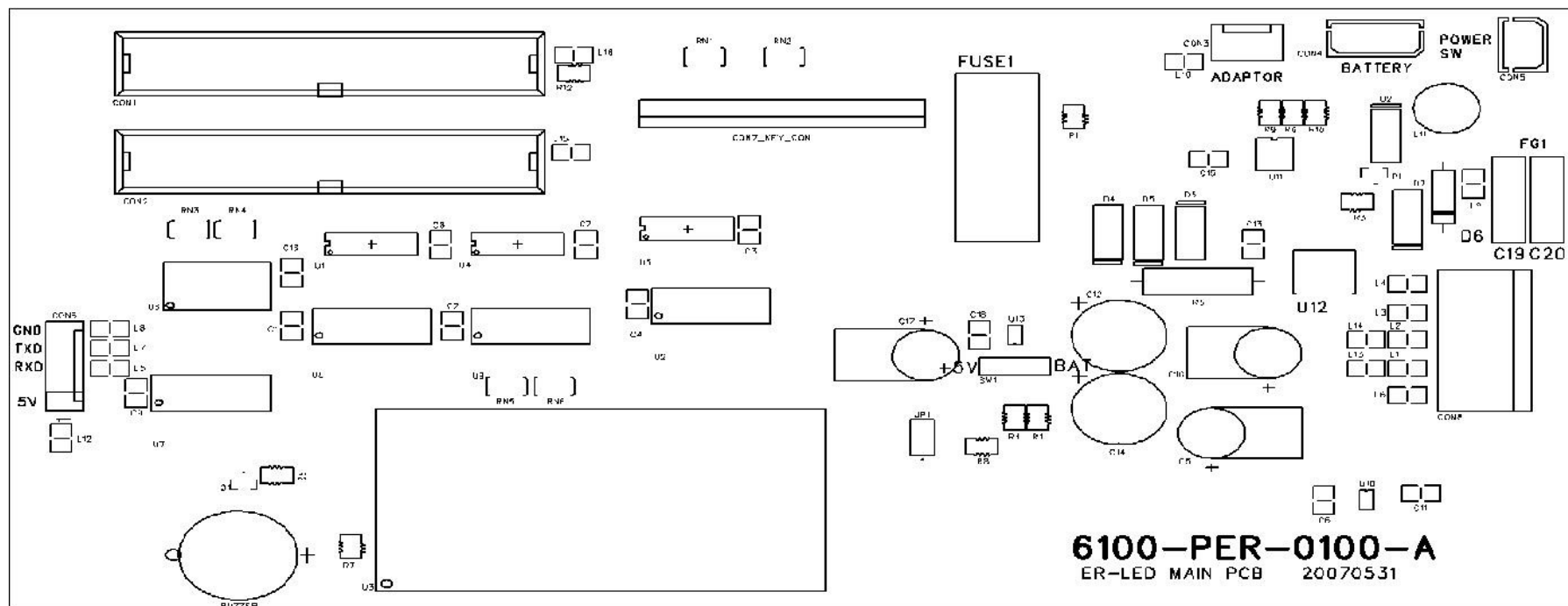


6.1.3. LED Version

6.1.3.1. Main PCB Part Location

- **DRAWING NUMBER : 9000-ER2-0011**

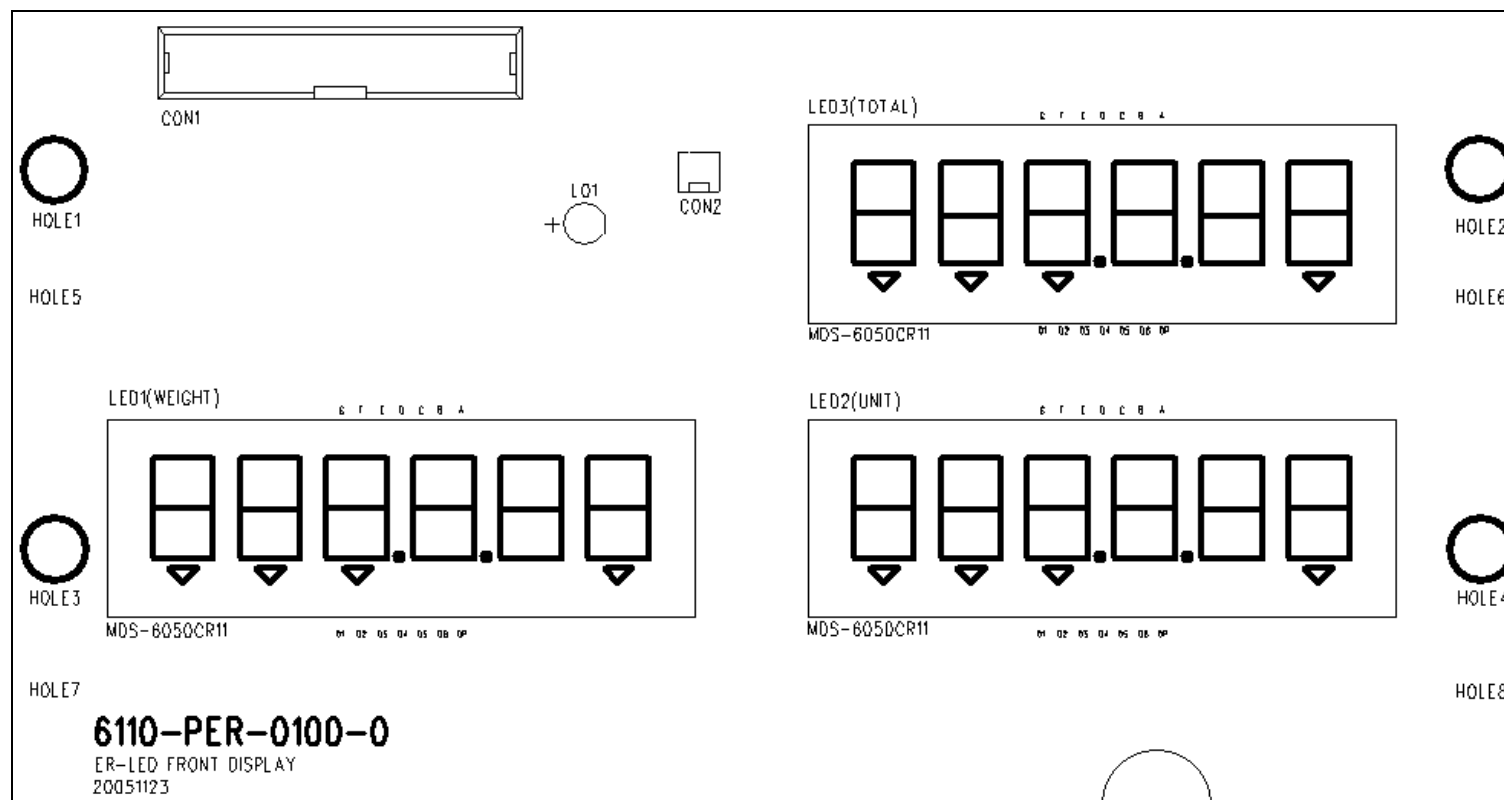
LED Main



6.1.3.2. FRONT DISPLAY PCB Part Location

- **DRAWING NUMBER : 9000-ER2-0012**

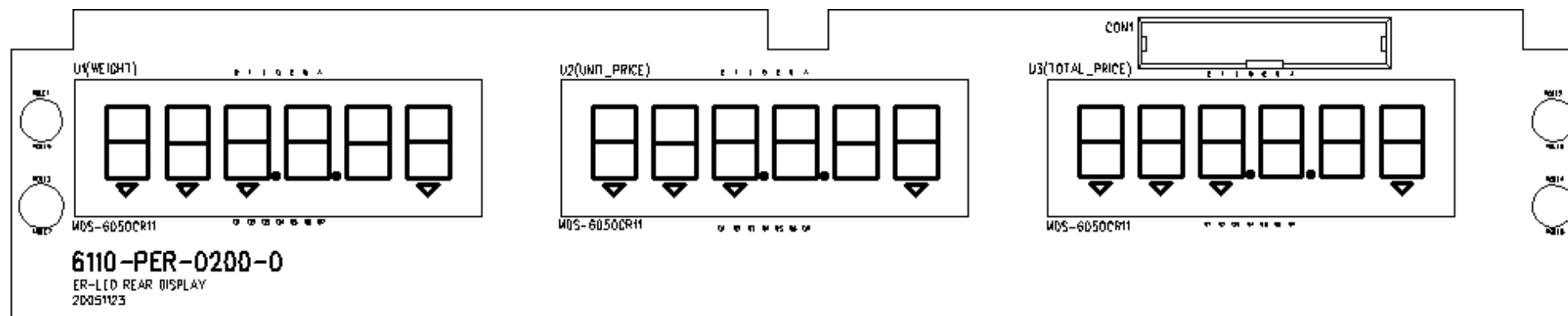
LCD FRONT DISPLAY



6.1.3.3. REAR DISPLAY PCB Part Location

- DRAWING NUMBER : 9000-ER2-0013

LED REAR DISPLAY

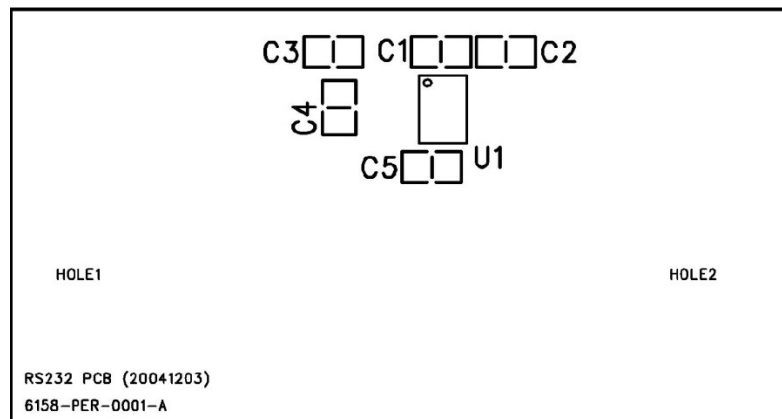


6.1.4. COMMON PCB.

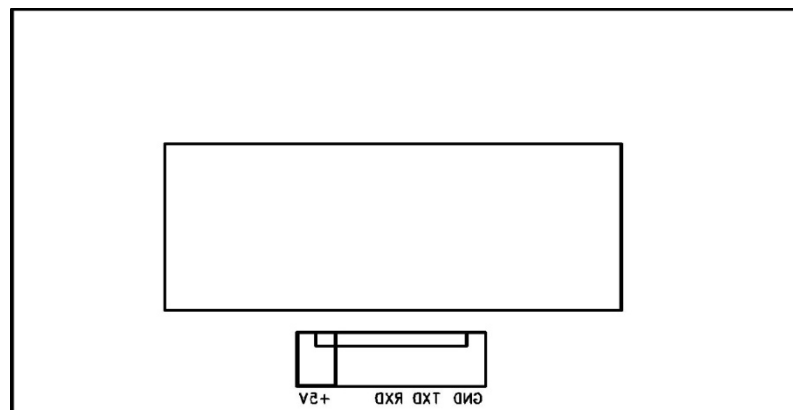
6.1.4.1. RS-232 MODULE PCB Part Location

- DRAWING NUMBER : 9000-ERS-0005

RS-232 PCB (TOP)



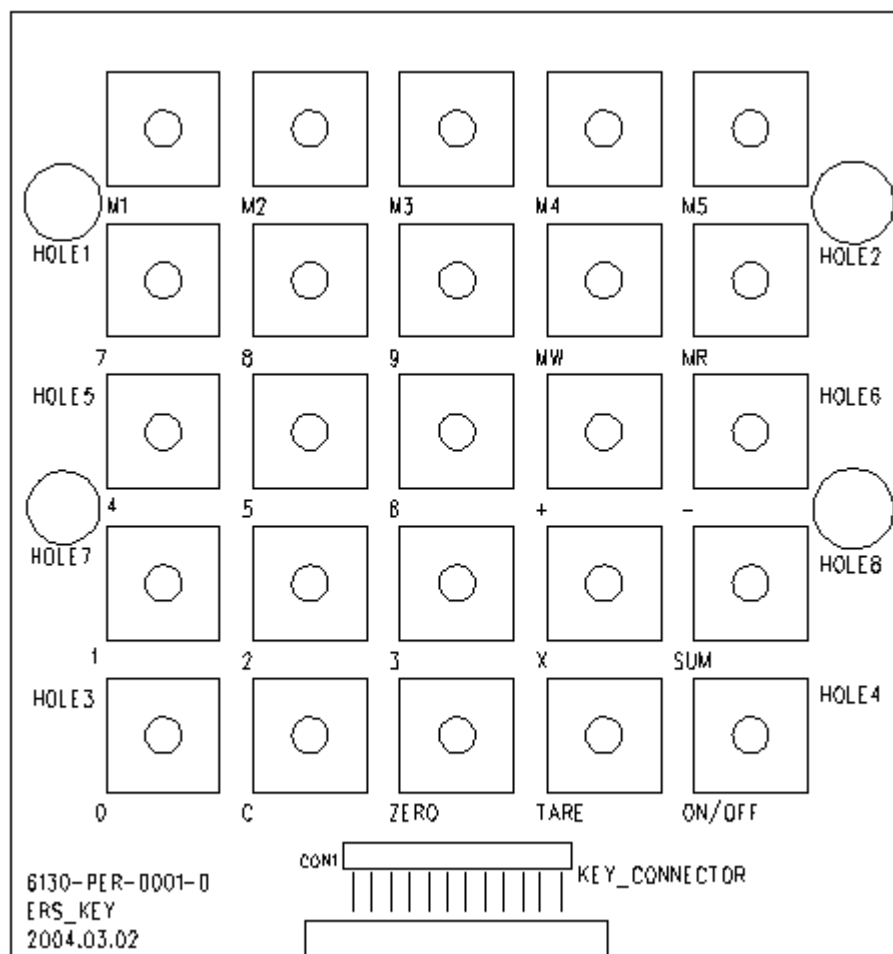
RS-232 PCB (BOTTOM)



6.1.4.2. KEY PCB Part Location (Pb)

- **DRAWING NUMBER : 9000-ERS-0006**

KEY PCB



4/10/2012

7. Error Messages & Solution

Error Message on Display	Description	Solution
"Err 0"	The "Err 0" occurs when scale is not stable.	Remove unstable facts.
"Err 1"	The "Err 1" occurs when a current zero point has shifted from the last span calibration.	Please call your CAS dealer.
"Err 2"	The "Err 2" is not a real error. Only it prompts return CAL switch to the normal position.	Please call your CAS dealer.
"Err 3"	The "Err 3" is an overload error.	Please remove the weight.
"Err 4"	The "Err 4" is leakage of payment.	Scale needs more payment.
"Err 5"	The "Err 5" means there is already tare.	Remove the tare.
"Err 6"	The "Err 6" means total price summation is over.	Please change unit price or remove some weight.
"Err 7"	The "Err 7" means total price is over.	Please change unit price or remove some weight.
"Err 8"	The "Err 8" means Euro rating price is over.	Please change unit price or change euro rate.
"Err 11"	The "Err 11" means a writing error of the internal nonvolatile memory. To recognize this error, be sure to check the voltage on the circuit and do calibration procedures.	If it still has "Err 11", replace the digital module.
"Err 12"	The "Err 12" warns that the scale has lost the parameters for weighing regulations or has lost the factors for a digital span calculation.	Enter each condition codes again (?). Please try a span calibration again if still not fixed.
"Err 13"	The "Err 13" means the soft key code is broken.	Please try to find out which key lost soft key code and then input this code again.
"Err 14"	The "Err 14" means calibration range is not correct.	Please call your CAS dealer.
"Err 15"	The "Err 15" means 1/2 or 1/4 unit price is over.	Please change unit price

8. Part List

ER(LCD) PART LIST

1.1 MAIN PCB ASS'Y [110E20EMAPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	MAIN PCB ASS'Y	ER-15CB(LCD_BACK LIGHT)	110ER0EMAPUN0101	1	MAIN PCB ASS'Y
1	PCB-MAIN	6100-PER-0001-A(ER LCD)	6100PER00010	1	MAIN PCB
2	ONE MODULE	ONE MODULE		1	ONE MODULE1
3	IC(REGULATOR)	KA7809A(D-PACK)	6220IS078090	1	U4
4	IC(REGULATOR)	XC6204C502MR(5.0V)	6220IS0C5020	1	U2
5	IC(LCD DRIVER)	HOLTEX HT1622 (ERS-LCD)	6224I0016220	1	U1
6	IC(DC DC CONVERTER)	MC34063AD	6242I003406A	1	U3

7	TRANSISTOR CHIP	KTA1504 SY	6281I0015040	1	Q3
8	TRANSISTOR CHIP	KTA1666	6281I0016660	1	Q1
9	TRANSISTOR CHIP	2N2222AS	6281I0022220	1	Q2
10	DIODE POWER	1N5819(SMD)	6291IS058190	4	D1,2,3,5
11	DIODE-POWER	1N5406	6291IP054060	1	D4
12	DIODE-SWITCHING	PMLL4148L(LP-CONT')	6294ISW4148A	1	D6
13	DIODE-CHIP	KDS184	6294ICP01840	1	D7
14	RESISTOR 2W	CFR 0.33 Ω ($\pm$ 5%)	6512CJ000033	1	R9
15	RESISTOR-CHIP 1/10W	RR1220P-100D(10 Ω)	6527ID001000	1	R16
16	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	6527ID300100	2	R8,15
17	RESISTOR-CHIP 1/10W	RR1220P-202D(2K)	6527ID300200	1	R12
18	RESISTOR-CHIP 1/10W	RR1220P-222D(2.2K)	6527ID300220	1	R5

19	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7K)	6527ID300470	1	R7
20	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	6527ID301000	3	R3,6,10
21	RESISTOR-CHIP 1/10W	RR1220P-203D(20K)	6527ID302000	1	R2
22	RESISTOR-CHIP 1/10W	RR1220P-101D(100)	6527ID010000	1	R13
23	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6527ID310000	4	R1,4,11,14
24	RESISTOR-CHIP-ARRAY	RP164P101J(=1608 100 X 4PCS)	6598IJ001000	2	RL1,2
25	RESISTOR-CHIP-ARRAY	RP164P103J(=1608 10k Ω X 4PCS)	6598IJ301000	2	RL3,4
26	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	6670T0001020	11	L1~9, L11,12
27	INDUCTANCE	220uH(NT SERIES)	6670T0102200	1	L10
28	CONDENSER-CERAMIC	0.01uF/3KV	6710CAP0103B	2	C14,16
29	CONDENSER-ELECTRIC	100uF/16V	6704C1601000	2	C1,7
30	CONDENSER-ELECTRIC	470uF/35V(short type)	6704C3504700	3	C8,11,12

31	CONDENSER-CHIP	CL21F 102KBNC	6712CHP01020	4	C2,3,4,5
32	CONDENSER-CHIP	CL21F 471KBNC	6712CHP04710	1	C10
33	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	4	C6,9,13,15
34	PIEZO BUZZER	APR,ADR(CHINA)	7002Z0000000	1	BUZZER1
35	TACT S/W	11902(DJTA-1102)	7600STA19020	1	CAL S/W
36	CONNECTOR(WAFER)	LW0640-05 (LPH01-05)	7801CLW00050	1	CN3
37	CONNECTOR(WAFER)	LWL0640-12 (LSW250-12)	7802CLL00120	1	CN6
38	CONNECTOR(WAFER)	5273-02 (LPH03-02)	7804CCN73020	1	CN1
39	CONNECTOR(WAFER)	5273-03 (LPH03-03)	7804CCN73030	1	CN5
40	CONNECTOR(WAFER)	03-5267	7805CCN67030	1	CN2
41	SOCKET CONNECTOR	5332-50P	7813C000050B	2	CN7,8
42	FUSE	1.6A/250V ø5 UL,S,VDE,BSI(우)fast blow type	7620S0516000	1	FUSE1

43	FUSE HOLDER	GF-205B(EXP-300L)	7630S0002050	1	FUSE1
44	JUMPER	2PIN	7821CJM00020	3	JP1,BAT,+5V

1.2 FRONT DISPLAY PCB ASS'Y [110ER3EFDPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	FRONT DISPLAY PCB ASS'Y	ER2-15CB(LCD)	110ER3EFDPPH0101	1	FRONT DISPLAY PCB ASS'Y
1	LED HOLDER	6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	
2	PCB-DISPLAY	6110-PER-0004-0(ER,P,LCD)(F)	6110PER00040	1	DISPLAY PCB(LCD R)FRONT
3	RESISTOR 1/4W	CFR 1K (±5%)	6515CJ300100	1	R1
4	LCD	2512STF-P(ER-LCD,BACK LIGHT 용)	7212D0025120	3	LCD1,2,3

5	BACK LIGHT	JHB2866/A (ER-1_LCD_6DIGIT)	7224D0028660	3	
6	LED LAMP	ø5-RED	7232DR00005A	1	LO1
7	FLAT CABLE CONNECTOR	50P*50P*35mm(ER R LCD)	7850W00A0350	1	CON2
8	FLAT CABLE CONNECTOR	50P*50P*1000mm(ER R LCD)	7850W00A1000	1	CON1

1.3 REAR DISPLAY PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	REAR DISPLAY PCB ASS'Y	ER2-15CB(LCD)	110ER3153GPH0101	1	REAR DISPLAY PCB ASS'Y
1	LED HOLDER	6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	
2	PCB-DISPLAY	6110-PER-0003-A(ER,P,LCD)(R)	6110PER0003A	1	DISPLAY PCB(LCD R)REAR

3	RESISTOR 1/4W	CFR 1K (±5%)	6515CJ300100	1	R1
4	LCD	2512STF-P(ER-LCD,BACK LIGHT 용)	7212D0025120	3	LCD1,2,3
5	BACK LIGHT	JHB2866/A (ER-1_LCD_6DIGIT)	7224D0028660	3	
6	LED LAMP	ø5-RED	7232DR00005A	1	LO1
7	SOCKET CONNECTOR	HIF3F-50PA-2.54DS	7813C000050A	1	CON1
8	JUMP WIRE	ø0.6*10m/m	7844W0001000	14	JP1~12,15,16

1.4 KEY BOARD PCB ASS'Y [110ER3EKEPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	KEY BOARD PCB ASS'Y	ER2-15CB(LCD)	110ER3EKEPPH0101	1	KEY BOARD PCB ASS'Y

1	PCB-KEY	6130-PER-0001-0(ER)	6130PER00010	1	KEY BOARD PCB
2	CLAMP FILTER	ZCAT1518-0730(BW-HIGH)	6830F0007300	1	CLAMP FILTER(KEY)
3	TACT S/W	12*12(SKHK)DJTA-1103E	7600STA12120	25	
4	FLAT CABLE CONNECTOR	12P*12P*320mm(EP(F),ER)유상	7850W0024320	1	CON1

1.5 RS232C PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	RS232C PCB ASS'Y	ER2-15CB(LCD)	110ER3153GPH0101	1	RS232C PCB ASS'Y
1	BOLT-CONNECTOR	1/8-6 UNC -외주	1507A0018060	2	CONNECTOR BOLT
2	PCB-RS232C	6158-PER-0001-A(ER)	6158PER0001A	1	RS232C PCB(232)

3	IC(LINE DRIVER)	ICL232CBE(SMD)	6240IS002320	1	U1
4	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	5	C,1,2,3,4,5
5	D-SUB CONNECTOR	D9S(RS-PIN) FEMALE	7812C0000090	1	CON2
6	CONNECTOR WIRE	5P*380mm,CORE(ER-RS232)	7840W0005380	1	CON1
7	GROUND TERMINAL ASS'Y	70mm(PD,TP,TC)(양단)	7860GND00700	1	GND TERMINAL ASS'Y

ER(LED) PART LIST
1.1 MAIN PCB ASS'Y [110E20EMAPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	MAIN PCB ASS'Y	ER-15CB(LCD_BACK LIGHT)	110ER0EMAPUN0101	1	MAIN PCB ASS'Y
1	PCB-MAIN	6100-PER-0100-A(ER LED)	6100PER00010	1	MAIN PCB
2	ONE MODULE	ONE MODULE		1	U3
3	IC(REGULATOR)	KA7809A(D-PACK)	6220IS078090	1	U12
4	IC(REGULATOR)	XC6204C502MR(5.0V)	6220IS0C5020	2	U10,13
5	IC(DRIVER)	ULN2003AD	6236IS020030	3	U1,4,5
6	IC(DC DC CONVERTER)	MC34063AD	6242I003406A	1	U11
7	IC(DRIVER)	TD62783AF	6236IS062780	1	U6

8	IC(C MOS)	74HC573D (LP-II)	6236IS00573A	4	U2,7,8,9
9	TRANSISTOR CHIP	KTA1504 SY	6281I0015040	1	Q1
10	DIODE POWER	1N5819(SMD)	6291IS058190	4	D2,3,4,5
11	DIODE-POWER	1N5406	6291IP054060	1	D6
12	DIODE-SWITCHING	PMLL4148L(LP-CONT')	6294ISW4148A	1	D7
13	DIODE-CHIP	KDS184	6294ICP01840	1	D1
14	RESISTOR 2W	CFR 0.33Ω (±5%)	6512CJ000033	1	R5
15	RESISTOR-CHIP 1/10W	RR1220P-100D(10Ω)	6527ID001000	1	R7
16	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	6527ID300100	1	R11
17	RESISTOR-CHIP 1/10W	RR1220P-202D(2K)	6527ID300200	1	R6
18	RESISTOR-CHIP 1/10W	RR1220P-331D(330Ω)	6527ID033000	1	R12
19	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7K)	6527ID300470	1	R1

20	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	6527ID301000	2	R8,10
21	RESISTOR-CHIP 1/10W	RR1220P-101D(100Ω)	6527ID010000	2	R2,9
22	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6527ID310000	2	R3,4
23	RESISTOR-CHIP-ARRAY	RP164P101J(=1608 100 X 4PCS)	6598IJ001000	4	RN1~4
24	RESISTOR-CHIP-ARRAY	RP164P103J(=1608 10kΩ X 4PCS)	6598IJ301000	2	RN5,6
25	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	6670T0001020	15	L1~10, L12~16
26	INDUCTANCE	220uH(NT SERIES)	6670T0102200	1	L11
27	CONDENSER-CERAMIC	0.01uF/3KV	6710CAP0103B	2	C19,20
28	CONDENSER-ELECTRIC	100uF/16V	6704C1601000	2	C5,17
29	CONDENSER-ELECTRIC	470uF/35V(short type)	6704C3504700	3	C10,12,14
30	CONDENSER-CHIP	CL21F 471KBNC	6712CHP04710	1	C15
31	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	12	C1~4,C6~9,C11,13,16,18

32	PIEZO BUZZER	APR,ADR(CHINA)	7002Z0000000	1	BUZZER1
33	TACT S/W	11902(DJTA-1102)	7600STA19020	1	CAL S/W
34	CONNECTOR(WAFER)	LW0640-05 (LPH01-05)	7801CLW00050	1	CON6
35	CONNECTOR(WAFER)	LWL0640-12 (LSW250-12)	7802CLL00120	1	CON7
36	CONNECTOR(WAFER)	5273-02 (LPH03-02)	7804CCN73020	1	CON5
37	CONNECTOR(WAFER)	5273-03 (LPH03-03)	7804CCN73030	1	CON4
38	CONNECTOR(WAFER)	03-5267	7805CCN67030	1	CON3
39	SOCKET CONNECTOR	5332-30P	7813C0000300	2	CON1,2
40	FUSE	1.6A/250V ø5 UL,S,VDE,BSI(우)fast blow type	7620S0516000	1	FUSE1
41	FUSE HOLDER	GF-205B(EXP-300L)	7630S0002050	1	FUSE1
42	JUMPER	2PIN	7821CJM00020	3	JP1,BAT,+5V

1.2 FRONT DISPLAY PCB ASS'Y [110ER2EFDUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	FRONT DISPLAY PCB ASS'Y	ER2-15CB(LED)	110ER2EFDUN0101	1	FRONT DISPLAY PCB ASS'Y
1	LED HOLDER	6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	
2	PCB-DISPLAY	6110-PER-0100-A(ER LED)(F)	6110PER01000	1	FRONT DISPLAY PCB
3	LED	MDS-2056DR11(CATHODE)	7230D00C2560	9	
4	LED LAMP	ø5-RED	7232DR00005A	17	LO1
5	FLAT CABLE CONNECTOR	30P*30P*1200mm(ER VFD)	7850W0060120	1	CON1(FRONT)
6	JUMP WIRE	ø0.6*10m/m	7844W0001000	58	JP1~58

1.3 REAR DISPLAY PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	REAR DISPLAY PCB ASS'Y	ER2-15CB(LCD)	110ER3153GPH0101	1	REAR DISPLAY PCB ASS'Y
1	PCB-DISPLAY	6110-PER-0200-0(ER LED)(R)	6110PER02000	1	REAR DISPLAY PCB
2	LED	MDS-2056DR11(CATHODE)	7230D00C2560	9	
3	LED LAMP	ø5-RED	7232DR00005A	16	LED1~16
4	FLAT CABLE CONNECTOR	30P*30P*320mm (ER-VFD)	7850W0030320	1	
5	JUMP WIRE	ø0.6*10m/m	7844W0001000	41	CON2~44

1.4 KEY BOARD PCB ASS'Y [110ER3EKEPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	KEY BOARD PCB ASS'Y	ER2-15CB(LCD)	110ER3EKEPPH0101	1	KEY BOARD PCB ASS'Y
1	PCB-KEY	6130-PER-0001-0(ER)	6130PER00010	1	KEY BOARD PCB
2	CLAMP FILTER	ZCAT1518-0730(BW-HIGH)	6830F0007300	1	CLAMP FILTER(KEY)
3	TACT S/W	12*12(SKHK)DJTA-1103E	7600STA12120	25	
4	FLAT CABLE CONNECTOR	12P*12P*320mm(EP(F),ER)유상	7850W0024320	1	CON1

1.5 RS232C PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	RS232C PCB ASS'Y	ER2-15CB(LCD)	110ER3153GPH0101	1	RS232C PCB ASS'Y

1	BOLT-CONNECTOR	1/8-6 UNC -외주	1507A0018060	2	CONNECTOR BOLT
2	PCB-RS232C	6158-PER-0001-A(ER)	6158PER0001A	1	RS232C PCB(232)
3	IC(LINE DRIVER)	ICL232CBE(SMD)	6240IS002320	1	U1
4	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	5	C,1,2,3,4,5
5	D-SUB CONNECTOR	D9S(RS-PIN) FEMALE	7812C0000090	1	CON2
6	CONNECTOR WIRE	5P*380mm,CORE(ER-RS232)	7840W0005380	1	CON1
7	GROUND TERMINAL ASS'Y	70mm(PD,TP,TC)(양단)	7860GND00700	1	GND TERMINAL ASS'Y

ER(VFD) PART LIST
1.1 MAIN PCB ASS'Y [110E20EMAPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	MAIN PCB ASS'Y	ER-15FR(VFD)	110ER0EMAPUN0101	1	MAIN PCB ASS'Y

1	PCB-MAIN	6100-PER-0010-A(ER VFD)	6100PER0010A	1	MAIN PCB
2	ONE MODULE	ONE MODULE		1	ONE MODULE1
3	IC(REGULATOR)	KA7809A(D-PACK)	6220IS078090	1	U1
4	IC(REGULATOR)	XC6204C502MR(5.0V)	6220IS0C5020	1	U5
5	VFD MODULE	SWP-C2015B(CONVERTOR M/D)	7204D002015A	1	U2
6	IC(DC DC CONVERTER)	MC34063AD	6242I003406A	1	U4
7	IC(FIP DRIVER)	UPD16310GF-3L9	6224IS016310	1	U3
8	TRANSISTOR CHIP	KTA1504 SY	6281I0015040	1	Q1
9	DIODE POWER	1N5819(SMD)	6291IS058190	4	D1~4
10	DIODE-POWER	1N5406	6291IP054060	1	D6
11	DIODE-SWITCHING	PMLL4148L(LP-CONT')	6294ISW4148A	1	D5
12	DIODE-CHIP	KDS184	6294ICP01840	1	D7

13	RESISTOR 2W	CFR 0.33Ω (±5%)	6512CJ000033	1	R15
14	RESISTOR-CHIP 1/10W	RR1220P-100D(10Ω)	6527ID001000	1	R1
15	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	6527ID300100	2	R19,22
16	RESISTOR-CHIP 1/10W	RR1220P-202D(2K)	6527ID300200	1	R17
17	RESISTOR-CHIP 1/10W	RR1220P-222D(2.2K)	6527ID300220	4	R2,4,5,6
18	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7K)	6527ID300470	1	R14
19	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	6527ID301000	2	R13,16
20	RESISTOR-CHIP 1/10W	RR1220P-203D(20K)	6527ID302000	7	R3,7,8,9,10,11,12
21	RESISTOR-CHIP 1/10W	RR1220P-101D(100)	6527ID010000	1	R20
22	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6527ID310000	2	R18,21
23	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	6670T0001020	11	L1~9, L11,12
24	INDUCTANCE	220uH(NT SERIES)	6670T0102200	1	L10

25	CONDENSER-CERAMIC	0.01uF/3KV	6710CAP0103B	2	C1,2
26	CONDENSER-ELECTRIC	100uF/16V	6704C1601000	1	EC4
27	CONDENSER-ELECTRIC	470uF/35V(short type)	6704C3504700	3	EC2,3,5
28	CONDENSER-ELECTRIC	47uF/50V	6704C5000470	1	EC1
29	CONDENSER-CHIP	CL21F 471KBNC	6712CHP04710	1	C7
30	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	5	C3,4,5,6,8
31	PIEZO BUZZER	APR,ADR(CHINA)	7002Z0000000	1	BUZZER1
32	TACT S/W	11902(DJTA-1102)	7600STA19020	1	CAL S/W
33	CONNECTOR(WAFER)	LW0640-05 (LPH01-05)	7801CLW00050	1	CON1
34	CONNECTOR(WAFER)	LWL0640-12 (LSW250-12)	7802CLL00120	1	CON5
35	CONNECTOR(WAFER)	5273-02 (LPH03-02)	7804CCN73020	1	CN1
36	CONNECTOR(WAFER)	5273-03 (LPH03-03)	7804CCN73030	1	CN4

37	CONNECTOR(WAFER)	03-5267	7805CCN67030	1	CN2
38	CONNECTOR(WAFER)	02-5267	7805CCN67020	1	CN3
39	SOCKET CONNECTOR	5332-30P	7813C0000300	2	CON2,3
40	FUSE	1.6A/250V ø5 UL,S,VDE,BSI(㉞)fast blow type	7620S0516000	1	FUSE1
41	FUSE HOLDER	GF-205B(EXP-300L)	7630S0002050	1	FUSE1
42	JUMPER	2PIN	7821CJM00020	3	JP1,BAT,+5V

1.2 FRONT DISPLAY PCB ASS'Y [110ER3EFDPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	FRONT DISPLAY PCB ASS'Y	ER-15FR(VFD)	110ER3EFDPPH0101	1	FRONT DISPLAY PCB ASS'Y

1	LED HOLDER	6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	
2	PCB-DISPLAY	6110-PER-0010-A(ER VFD)(F)	6110PER0010A	1	DISPLAY PCB(VFD_FRONT)
3	RESISTOR 1/2W	CFR 20Ω (±5%)	6514CJ002000	1	R1
4	VFD(FIP)	F-42B(12DIGIT)	7202D00042B0	1	VFD1
5	VFD(FIP)	F-52B(7DIGIT)	7202D00052B0	1	VFD2
6	LED LAMP	ø5-RED	7232DR00005A	1	L01
7	CONNECTOR WIRE	2P*100mm(ER, LED WIRE)	7840W0002101	1	CN8
8	JUMP WIRE	ø0.6*10m/m	7844W0001000	11	JP1~11
9	FLAT CABLE CONNECTOR	30P*30P*1200mm(ER VFD)	7850W0060120	1	CCON10

1.3 REAR DISPLAY PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	REAR DISPLAY PCB ASS'Y	ER-15FR(VFD)	110ER3153GPH0101	1	REAR DISPLAY PCB ASS'Y
1	PCB-DISPLAY	6110-PER-0020-0(ER VFD)(R)	6110PER00200	1	DISPLAY PCB
2	RESISTOR 1/2W	CFR 20Ω (±5%)	6514CJ002000	1	R1
3	VFD(FIP)	F-42B(12DIGIT)	7202D00042B0	1	VFD1
4	VFD(FIP)	F-52B(7DIGIT)	7202D00052B0	1	VFD2
5	JUMP WIRE	ø0.6*10m/m	7844W0001000	7	JP1~7
6	FLAT CABLE CONNECTOR	30P*30P*320mm (ER-VFD)	7850W0030320	1	CON11

1.4 KEY BOARD PCB ASS'Y [110ER3EKEPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	KEY BOARD PCB ASS'Y	ER-15FR(VFD)	110ER3EKEPPH0101	1	KEY BOARD PCB ASS'Y
1	PCB-KEY	6130-PER-0001-0(ER)	6130PER00010	1	KEY BOARD PCB
2	CLAMP FILTER	ZCAT1518-0730(BW-HIGH)	6830F0007300	1	CLAMP FILTER(KEY)
3	TACT S/W	12*12(SKHK)DJTA-1103E	7600STA12120	25	
4	FLAT CABLE CONNECTOR	12P*12P*320mm(EP(F),ER)유상	7850W0024320	1	CON1

1.5 RS232C PCB ASS'Y [110ER3153GPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	RS232C PCB ASS'Y	ER-15FR(VFD)	110ER3153GPH0101	1	RS232C PCB ASS'Y

1	BOLT-CONNECTOR	1/8-6 UNC -외주	1507A0018060	2	CONNECTOR BOLT
2	PCB-RS232C	6158-PER-0001-A(ER)	6158PER0001A	1	RS232C PCB(232)
3	IC(LINE DRIVER)	ICL232CBE(SMD)	6240IS002320	1	U1
4	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	5	C,1,2,3,4,5
5	D-SUB CONNECTOR	D9S(RS-PIN) FEMALE	7812C0000090	1	CON2
6	CONNECTOR WIRE	5P*380mm,CORE(ER-RS232)	7840W0005380	1	CON1
7	GROUND TERMINAL ASS'Y	70mm(PD,TP,TC)(양단)	7860GND00700	1	GND TERMINAL ASS'Y