ER^{PLUS} SERVICE MANUAL

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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 ER 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^{PLUS} – 6	ER^{PLUS} – 15	ER^{PLUS} – 30
Capacity	*Dual Interval* 3 kg / 0.001 kg 6 kg / 0.002 kg	*Dual Interval* 6 kg / 0.002 kg 15 kg / 0.005 kg	*Dual Interval* 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	ER ^{PLUS}　　　　: 5 / 6 / 6 (Weight/Unit Price/Total Price) ER ^{PLUS-M}　: 6 / 6 / 8 (Weight/Unit Price/Total 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 € (Euro currency convertible keys)		
Function	Weighting AUTO POWER OFF BACK LIGHT AUTO ON/OFF PLU PRINTER INTERFACE (RS-232)		
Product Size	Pole Type : 360 (W) x 350 (D) x 410 (H) Standard Type : 360 (W) x 350 (D) x 106 (H)		
Product Weight	Pole Type : 5.5kg Standard Type : 4.7kg		
Platter Size	304 (W) X 220 (D)		
Operating Temperature	- 10 ℃ ~ +40 ℃		
Options	Rechargeable Battery BACK LIGHT (LCD ONLY) Dry Battery		

1.3.2. Pound (lb) Version

	ER^{PLUS} – 15LB	ER^{PLUS} – 30LB	ER^{PLUS} – 60LB
Capacity	*Dual Interval* 6 lb / 0.002 lb 15 lb / 0.005 lb	*Dual Interval* 15 lb / 0.005 lb 30 lb / 0.01 lb	*Dual Interval* 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	ER ^{PLUS} : 5 / 6 / 6 (Weight/Unit Price/Total Price) ER ^{PLUS-M} : 6 / 6 / 8 (Weight/Unit Price/Total 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 € (Euro currency convertible keys*).*		
Functions	Weighting AUTO POWER OFF BACK LIGHT AUTO ON/OFF PLU PRINTER INTERFACE (RS-232)		
Product Size	Pole Type : 360 (W) x 350 (D) x 410 (H) Standard Type : 360 (W) x 350 (D) x 106 (H)		
Product Weight	Pole Type : 5.5kg Standard Type : 4.7kg		
Platter Size	304 (W) X 220 (D)		
Operating Temperature	- 10 ℃ ~ +40 ℃		
Options	Rechargeable Battery BACK LIGHT (LCD ONLY) Dry Battery		

1.4. ER^PLUS LCD Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LCD displays for Weight, Unit price and Total price(6/6/6digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V 4AH/20HR)		
Option	Backlight		

1.5. ER^PLUS VFD Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three VFD displays for Weight, Unit price and Total price(6/6/6digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V 4AH/20HR)		

1.6. ER^PLUS LED Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LED displays for Weight, Unit price and Total price(6/6/6digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V 4AH/20HR)		

1.7. ER^PLUS-M LCD Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LCD displays for Weight, Unit price and Total price(6/6/8digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V 4AH/20HR)		
Option	Backlight		

1.8. ER^PLUS-M LED Version

	ER-6KG/15LB	ER-15KG/30LB	ER-30KG/60LB
Display	Three LED displays for Weight, Unit price and Total price(6/6/8digits) POWER LED		
Power	12 V Adaptor or PB BATTERY (6V 4AH/20HR)		

1.9. Dimension
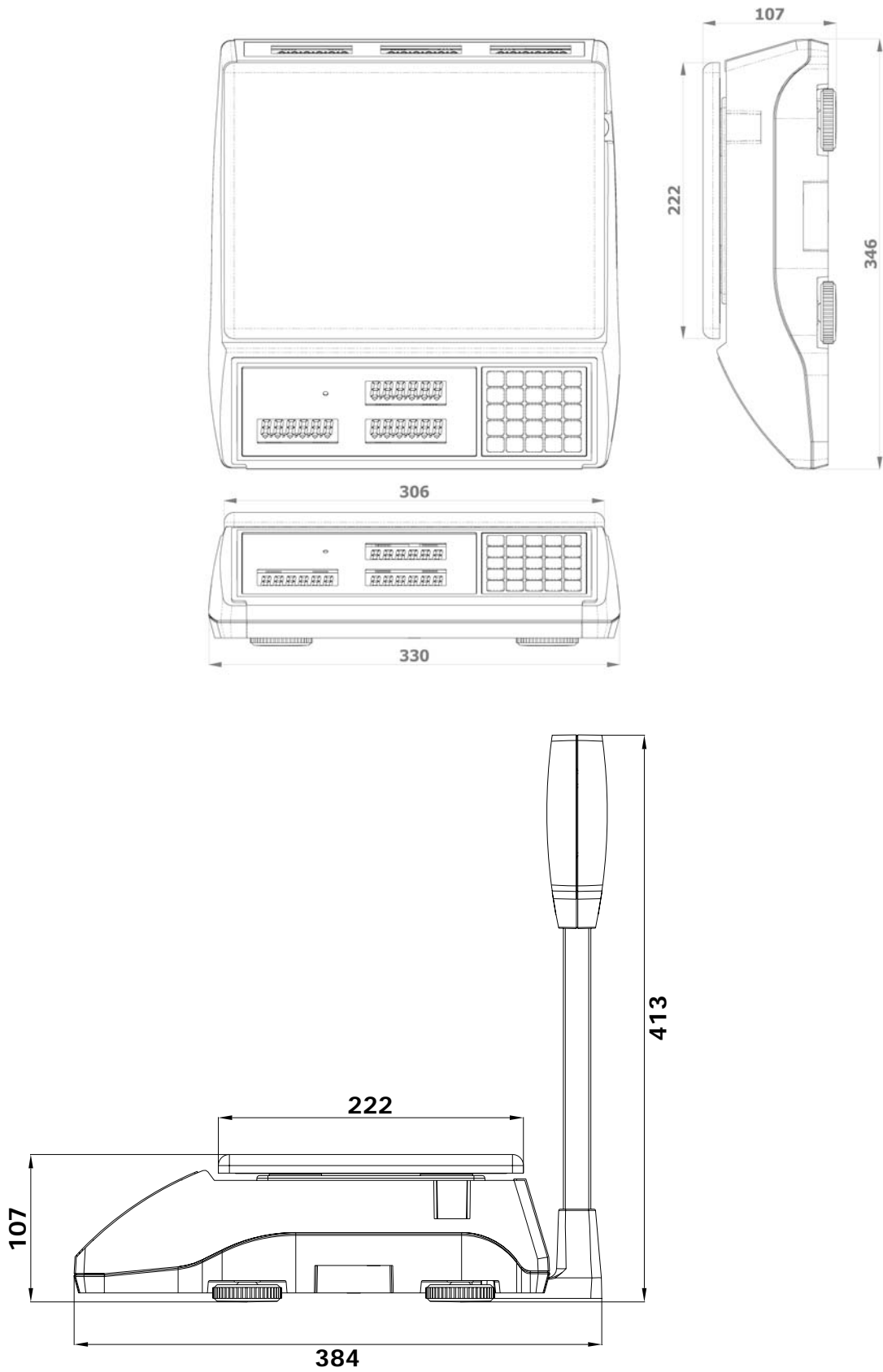
1.10.Sealing Method

REVISIONS			2		3			
MODEL NO.	PART NO.	REV	SYM	CONTENTS		DRAWN	CHECKED	APPROVED

SEALING BOLT

SEALING PLATE

SEALING WIRE

SEALING LEAD

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	*SHOPPING SCALE*	MATERIAL *N/A*
	Q'TY/SET	FIRST MADE FOR	*ER*	END FINISH *SEE NOTES*
	1 / 1	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*	*O*
. .20	. .20	. .20	. .20			

CAS FORM A4 (210mmx297mm)

REVISIONS				2		3			
MODEL NO.	PART NO.	REV	SYM		CONTENTS		DRAWN	CHECKED	APPROVED

SEALING
STICKER

SEALING
STICKER

NO	PARTS NAME	SPECIFICATION	Q'TY	REMARK

TOLERANCES .UNLESS OTHERWISE SPECIFIED		NAME OR TITLE	**CAS**	
ANGULAR ± N/A		*SEALING METHOD*	CAS CORPORATION #19 KANAP—RI KWANGJEOK—MYON YANGJU—KUN KYUNGKI—DO,KOREA	
DECIMAL ± N/A		FIRST USED IN ASSEMBLY *TICKET PRINTING SCALE*	MATERIAL N/A	
⊕⊲	Q'TY/SET 1/1	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—0001*	*O*
. .20	. .20	. .20	. .20			

CAS FORM A4 (210mmx297mm)

2. Calibration

2.1. General Calibration

Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode and then the scale displays "CAL 1" after "onE".

User can move to other menu by using [ZERO] key (Next) or [−] key (Previous).

User can also enter the sub-menus in each mode by using [TARE] key.

If you want to escape from the selected mode, Press the [C] key.

To confirm the modified setting, press the [TARE] key.

| MODE	Function
CAL 1	Display normalized AD value
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	Optional Setting (See "C-4 Table" on the next page)
CAL 5	Display filtered Raw AD value
CAL 6	Function settings on each Key (See "C-6 Table" on the page 17)
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] "Mid" → [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] "tare" → [TARE] → Enable custom tare (0:disable, 1:enable) → [TARE]
CAL 11	Initialize settings(00 : OIML , 01 : NTEP , 02: KOREA), Set AD as default (99), Set KEY as default (98)

2.1.1. C4 Setting

ER^{PLUS} stores optional settings by using hexadecimal number in C-4 menu. When you entered CAL-4, it will display hexadecimal number on the Total Price Display panel. For example, it displays B0 in C41 setting. $B0_{(16)}$ represents $10110000_{(2)}$ in the binary system. It means that scale has been set by (+/-)10% zero range, last digit invalid enable, (+/-)2% key zero percent, proper successive tare type and gross zero indication settings. Please refer to below table.

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Value	1	0	1	1	0	0	0	0

2.1.1.1. C4-1 Setting (AD)   * Default values are highlighted

Bit	Set (1)	Clear (0)	Remark
7, 6	Initial Zero Range		00 : ±2%
			01 : ±3%
			10 : ±10%
			11 : ±5%
5	Last Digit Invalid Enable	Last Digit Invalid Disable	Same as 4-4 3rd bit
4	±2% Key zero percent	±3% Key zero percent	For Sri Lanka
3, 2	Successive Tare Type		00 : Proper
			01 : Positive Direction
			10 : Negative Direction
			11 : All Direction
1, 0	Zero mark type		00 : Gross zero indication
			01 : Net zero indication
			10 : Both zero indication

2.1.1.2. C4-2 Setting (Sale functions)

Bit	Set (1)	Clear (0)	Remark
7	USE PLU Valid date	Don't Use PLU Valid date	
6	Use PLU Tare	Don't Use PLU Tare	
5	Use PLU Name	Don't Use PLU Name	
4	Use Daily Total	Don't Use Daily Total	
3	Use Price Clear	Don't Use Price Clear	
2	Use Tare Clear	Don't Use Tare Clear	
1	Use Euro Conversion	Don't Use Euro Conversion	
0	Use Power On Euro Conversion	Don't Use Power On Euro Conversion	

2.1.1.3. C4-3 Setting (Sale functions)

Bit	Set (1)	Clear (0)	Remark
7	Dot type Comma	Dot type Dot	
6	Use Preset Tare	Don't Use Preset Tare	
5	Use Backlight	Don't Use Backlight	
4	Use Head Message	Don't Use Head Message	
3	Use Gram Unit	Don't Use Gram Unit	
2	Use Ounce Unit	Don't Use Ounce Unit	
1	Use Pound Unit	Don't Use Pound Unit	
0	Use Kilo Gram Unit	Don't Use Kilo Gram Unit	

2.1.1.4. C4-4 Setting (Sale functions)

Bit	Set (1)	Clear (0)	Remark
7	RESERVED		
6			
5, 4	Round Off		00 : Normal, Don't Use
			01 : 5
			10 : 10
			11 : 25
3	Last Digit Invalid Enable	Last Digit Invalid Disable	Same as 4-1 5th bit
2	Use Unit Price Per 100g	Use Unit Price Per 1kg	
1, 0	Price for Unit		00 : 10
			01 : 100
			10 : 1000
			11 : 10000

2.1.1.5. C4-5 Setting (Sale functions)

Bit	Set (1)	Clear (0)	Remark
7	RESERVED		
6, 5, 4	Price Decimal Position		000 : 0
			001 : 0.0
			010 : 0.00
			011 : 0.000
			100 : 0.0000
3	Use Canada Message	Don't Use Canada Message	Kg : METRIC, Lb : POUND
2	RESERVED		
1, 0	Usable Printer List		00 : Don't Use
			01 : DEP-50
			10 : DLP-50

2.1.2. SPAN Calibration Setting (C-3) * Set the CAL-10 setting first.

(1) Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode.

(2) Then, the scale displays "CAL 1" message after "ONE" message.

(3) Press [ZERO] key two times to display "CAL-3".

(4) Press [TARE] key and then it displays "zero " message.

(5) Press [TARE] key and then it displays "midup" message

(6) Load middle weight (ex:1/3 of full capacity) on the platform

(7) Press [TARE] key and then it displays "FULL " message

(8) Load full weight on the platform

(9) Press [TARE] key and then it displays "middn" message

(10) Load middle weight (ex:1/3 of full capacity) on the platform

(11) Press [TARE] key and then it display "CAL 3" message

* ERPLUS uses 3 points calibration to weigh precisely. However, if you want to use 1 point calibration, set mid-value as "0" in "CAL-10" setting.

2.1.3. Gravity Constant Value Setting (C-9)

Current gravitational Acceleration value is set to 9.7946 m/s^2 .

(1) Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode.

(2) Then, the scale "CAL 1" message after "ONE" message.

(3) Press [ZERO] to display "C-9".

(4) Press [TARE] key, and then " G-1" message and "9.7946" will be shown. G-1 means Gravity constant value at the location that the span of scale has been calibrated.

(5) Input a gravitational acceleration value by keypad and press [TARE] key to set.

(6) And then "G-2" message and "9.7946" will be shown. G-2 means Gravity constant value in the location that the scale will be used. In this case, G-2 value is not modified yet.

(7) Input a gravitational acceleration value by keypad.

(8) Press [TARE] key to save the gravitational acceleration value, and then "C-9 " message will be shown. It indicates

(9) In addition, ER Plus will set G-1 value to G-2 value automatically when you recalibrate at the new place. Therefore, just set the G-1 value before calibrating the scale.

2.1.4. Calibration factor Setting (C-10) * Refer to CAL-10 Table.

(1) Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode.

(2) Then, the scale displays "CAL 1" message after "ONE" 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" It means calibration unit is "kg" (0 : kg, 1 : lb)

(5) Input a calibration unit by using keypad.

(6) Press [TARE] key to set the value, and then the scale displays "CAPA" and "15". It means that full-capability is "15 (calibration unit, kg or lb)"

(7) Input a capability by using [TARE] key.

(8) And then "mid" message is displayed. "5" will be shown. It means that mid-capability is "5 (calibration unit, kg or lb)"

(9) Input a mid-capability by using keypad.

(10) Press [TARE] key, and then "W-dP "message and "3" will be shown. It means that weight decimal point is "3 (will display 0.000)"

(11) Input a weight decimal point by keypad.

(12) Press [TARE] key, and then "1d " message and "0.005" will be shown. It means that the one division is "0.005 (calibration unit, kg or lb)"

(13) Input an one division by using keypad.

(14) Press [TARE] key, and then "dual" message and "1" will be shown. It means that dual interval is enabled. (0 : disable, 1 : enable)"

(15) Input a dual interval setting by using keypad.

(16) Press [TARE] key, and then "tare" message and "0" will be shown. You can **enable or disable custom tare (0:disable, 1:enable)**

(17) Press [TARE] key to save calibration factor and then "C-10 " message will be shown. Add to this you can browse any menu to reset value by using [ZERO]key and [-] key in the C-10 Mode.

* CAL-1O TABLE

CAPA(Kg)	Interval	Resolution	CAL 10 SETTING						
			Unit	CAPA	Mid	W-dp	1d	dual	tare
1	Dual	1/2000	3	1000	500	1	0.5	1	0 or 1
2	Single	1/10000	3	2000	1000	1	0.2	0	0 or 1
2	Dual	1/2000	0	2	1	3	0.001	1	0 or 1
3	Dual	1/3000	0	3	1	3	0.001	1	0 or 1
5	Single	1/10000	3	5000	2000	1	0.5	0	0 or 1
5	Dual	1/2500	0	5	2	3	0.002	1	0 or 1
6	Dual	1/3000	0	6	3	3	0.002	1	0 or 1
10	Single	1/10000	0	10	5	3	0.001	0	0 or 1
10	Dual	1/2000	0	10	5	3	0.005	1	0 or 1
12	Dual	1/2400	0	12	5	3	0.005	1	0 or 1
15	Dual	1/3000	0	15	5	3	0.005	1	0 or 1
20	Single	1/10000	0	20	10	3	0.002	0	0 or 1
20	Dual	1/2000	0	20	10	2	0.01	1	0 or 1
25	Dual	1/2500	0	25	10	2	0.01	1	0 or 1

CAPA	Single/Dual	W-dp×1d	Unit	CAPA	Mid	1d	W-dp	dual	tare
30	Single	1/15000	0	30	10	3	0.002	0	0 or 1
30	Dual	1/3000	0	30	10	2	0.01	1	0 or 1
50	Dual	1/2500	0	50	20	2	0.02	1	0 or 1
60	Dual	1/3000	0	60	20	2	0.02	1	0 or 1
100	Dual	1/2000	0	100	40	2	0.02	1	0 or 1
150	Dual	1/3000	0	150	60	2	0.05	1	0 or 1
200	Dual	1/2000	0	200	100	1	0.1	1	0 or 1
300	Dual	1/3000	0	300	100	1	0.1	1	0 or 1
500	Dual	1/2500	0	500	200	1	0.2	1	0 or 1
600	Dual	1/3000	0	600	200	1	0.2	1	0 or 1
1000	Dual	1/2000	0	1000	500	1	0.5	1	0 or 1
2000	Dual	1/2000	0	2000	1000	0	1	1	0 or 1
3000	Dual	1/3000	0	3000	1000	0	1	1	0 or 1
5000	Dual	1/2500	4	5	2	3	0.002	1	0 or 1
10000	Dual	1/2000	4	10	5	3	0.005	1	0 or 1
15000	Dual	1/3000	4	15	5	3	0.005	1	0 or 1
20000	Dual	1/2000	4	20	10	2	0.01	1	0 or 1
30000	Dual	1/3000	4	30	10	2	0.01	1	0 or 1
50000	Dual	1/2500	4	50	20	2	0.02	1	0 or 1
60000	Dual	1/3000	4	60	20	2	0.02	1	0 or 1

Unit	Meaning	Remark
0	Kilo gram	
1	Pound	
3	Gram	
4	Ton	

CAPA	Max capa
Mid	Mid capa
W-dp	Position of decimal point
1d	Actual scale interval
dual	Dual Interval setting (1: use, 0: nonuse)
tare	Tare setting (1: Custom, 0: Proper)
"W-dp" and "1d" are high interval in dual.	

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

Display Raw AD value. This value is used to check status of Load cell when displayed weight is unstable.

2.1.6. Allocate Function Key Codes to Changeable keys (C-6)

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

(2) Move to C-6 Mode by pressing [ZERO] or [-] key and press [TARE] key to enter the mode.

(3) "E-SET" will be displayed on the weight window.

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

(5) Input the number '16' as SOFT KEY CODE and then press '+' key. That means, allocate "add" function to "+" key.

(6) Press 'C' key to exit from "Input Soft Key Code" mode.

NOTE: User doesn't need MATRIX KEY CODES to input soft key code, because MATRIX KEY CODES are fixed in hardware.

* CHANGEABLE KEYS & SOFT KEY CODES

FUNCTION	SOFT KEY CODES	REMARK
"00"	11	
ADD	16	
FIXED ADD	17	
SUM	18	
PAY	19	
PLU CALL	20	
PLU SAVE	21	
CANCLE	22	
MODE	23	
1/2	24	
1/4	61	25 (in previous version)
PRE PACK	26	
UNIT CHANGE (KG/LB)	27	
DISPLAY TEST	28	
HOLD	29	
PRINT ENABLE	30	
NO FUNCTION	31	
EURO	60	
PERCENT TARE	62	
TARE SAVE	63	
BOTH SAVE	64	
PERCENT TARE SET	65	
MUL "X"	66	

100 gram	67	
BATTERY CHECK	70	
BACK LIGHT ON/OFF	71	
STAR	80	
SET	81	
SAMPLE	82	
PRINT	83	
CLERK 1ST~5TH	84~88	
OPEN CLERK	89	
SEND CLERK	90	
SEND BARCODE	91	
DIRECT PLU	128~168	

* FIXED KEYS & THEIR SOFT KEY CODES

KEYS	MATRIX KEY CODES	SOFT KEY CODES
"0"	20	0
"1"	15	1
"2"	16	2
"3"	17	3
"4"	10	4
"5"	11	5
"6"	12	6
"7"	5	7
"8"	6	8
"9"	7	9
"C"	21	10
"ON/OFF"	24	12
"ZERO"	22	13
"TARE"	23	14

2.1.7. Percent Calibration (C-7)

(1) Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode.

(2) Then, the scale displays "CAL 1" message after "ONE" message.

(3) Press [ZERO] key to display "CAL-7".

(4) Press [TARE] key and then it displays "per 10 " message. Select the percent value using numerical keypad. You can choose 10~90 percent.

(5) Press [TARE] key and then it displays "zero" message

(6) Press [TARE] key and then it displays "pspan " message

(7) Load chosen percentage weight of full weight on the platform

(8) Press [TARE] key and then it displays "CAL 7" message

2.1.8. Battery Calibration (C-8)

(1) Hold down "Calibration Switch" and "[POWER] key" to enter Calibration mode.

(2) Then, the scale displays "CAL 1" message after "ONE" message.

(3) Press [ZERO] key to display "CAL-8".

(4) Press [TARE] key and then it displays voltage of battery.

(5) Change the jumper-pin of main PCB, 'BAT' to '+5V'.

(6) Press [ZERO] key two times and then Press [-] key two times.
    And then it displays '500'

(7) Change the jumper-pin of main PCB, '+5V' to 'BAT'.

(8) You can see the calibrated voltage of battery.

3. The Schematics and Diagram

3.1. System Block Diagram

ER

MAIN BOARD

RS232

Load Cell

KEY

ONE MODULE

REAR DISPLAY

LCD LED VFD Driver

LCD Display LED Display VFD Display

RECHARGE

POWER (12V Adaptor)

Pb BATTERY (6V 5Ah)

4. Exploded View

5. Load Cell drawing

CAS CORPORATION

6. Part Location

6.1. ER^{PLUS} LCD Version

6.1.1.1.   Main PCB Part Location

● **DRAWING NUMBER : 9000-ERO-0006**

ER^{PLUS} LCD MAIN
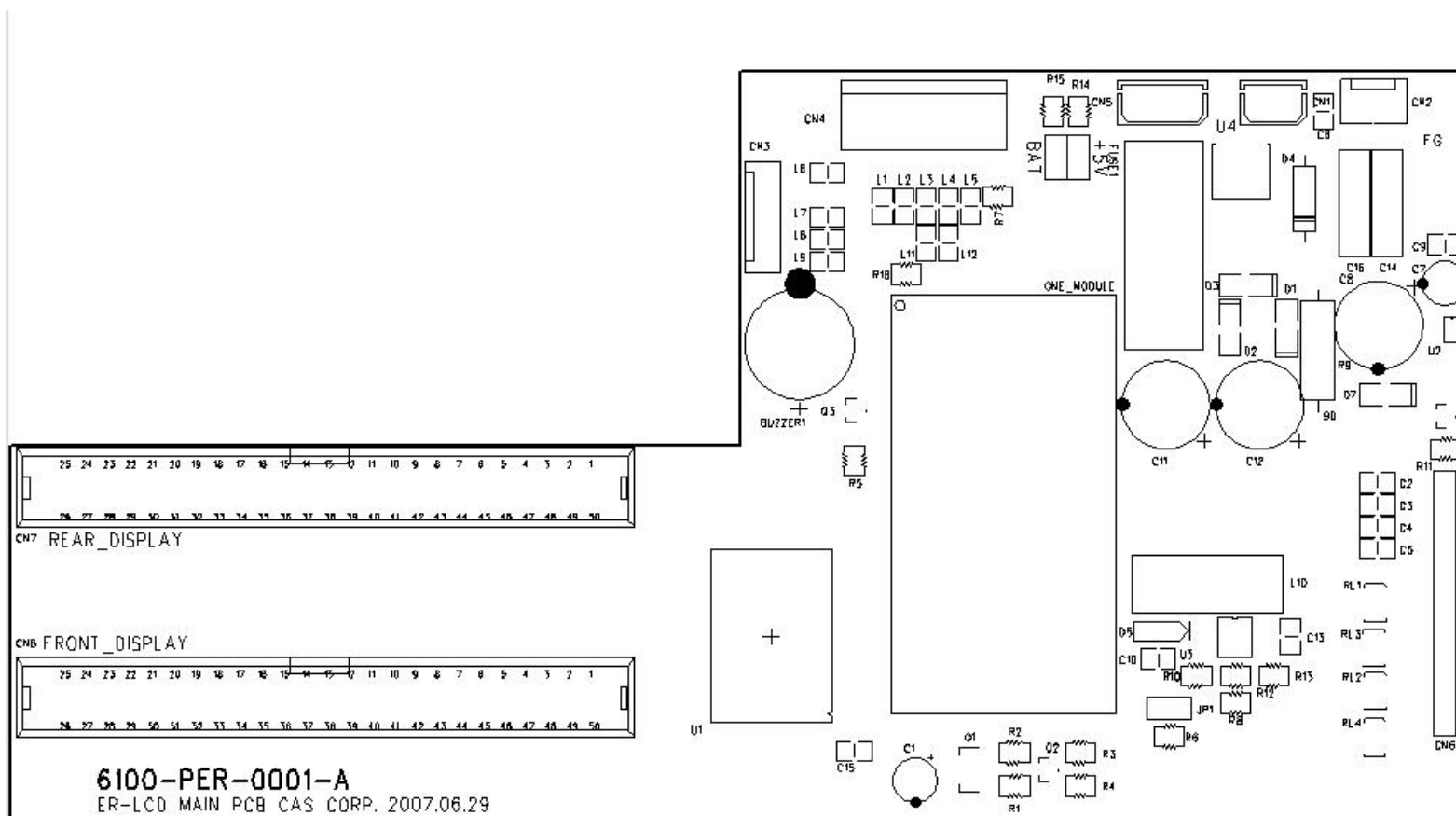
6.1.1.2. FRONT DISPLAY PCB Part Location

● DRAWING NUMBER : 9000-ERS-0007

ER^{PLUS} LCD FRONT DISPLAY
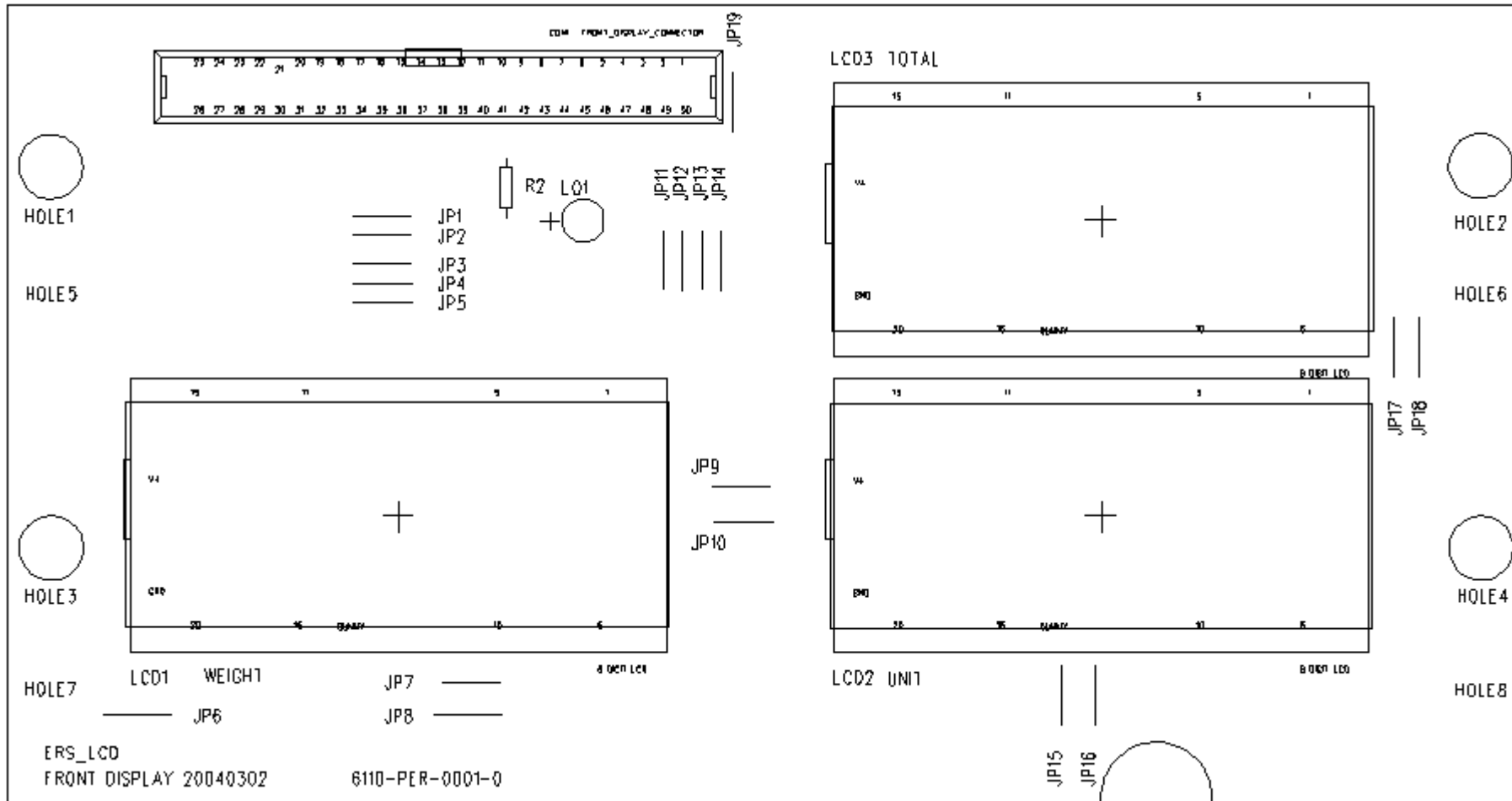
6.1.1.3.   **REAR DISPLAY PCB Part Location**

●   **DRAWING NUMBER : 9000-ERS-0008**

ER^{PLUS} LCD REAR DISPLAY
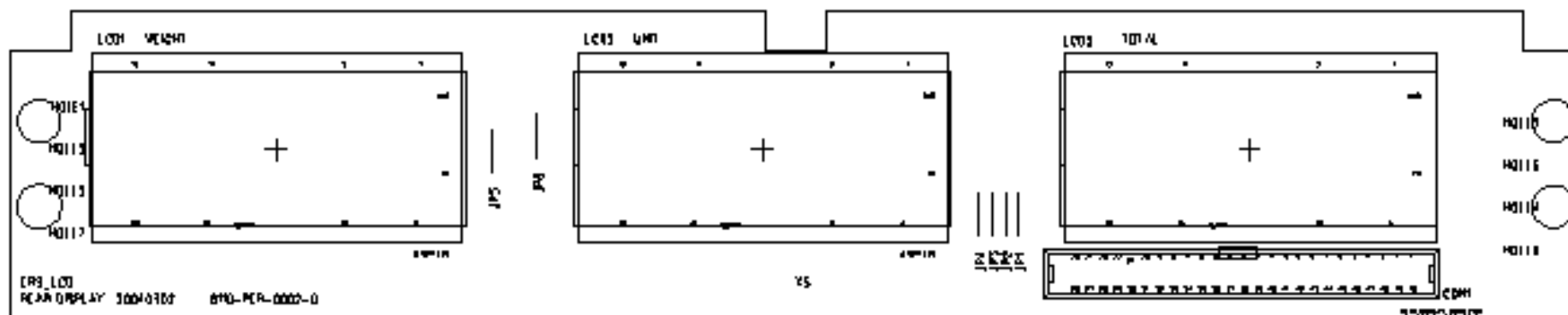
6.1.1.4. POLE DISPLAY PCB Part Location

● **DRAWING NUMBER : 9000-ERS-0009**

ER^{PLUS} LCD FRONT DISPLAY
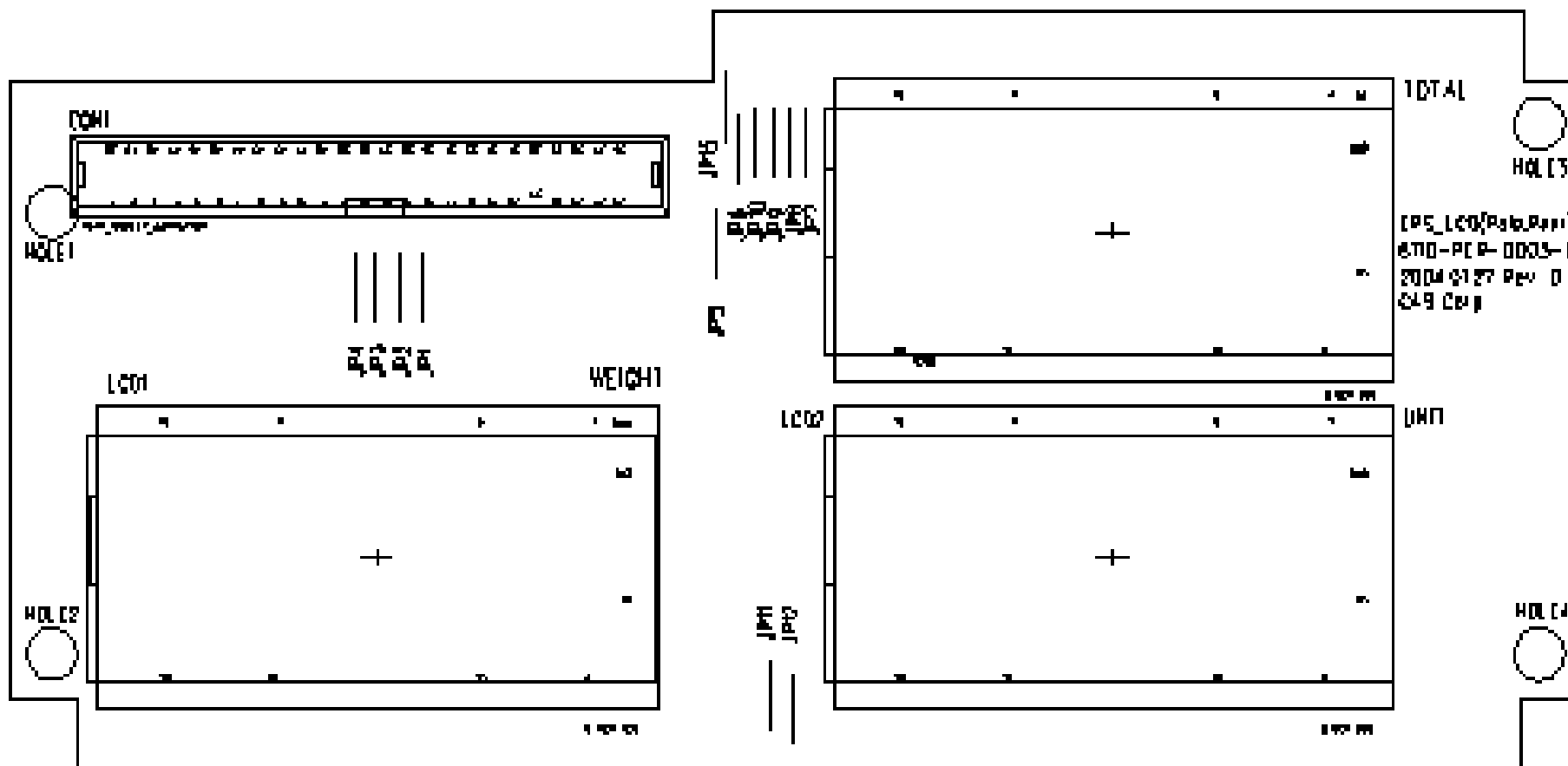
● **DRAWING NUMBER : 9000-ERS-0010**

ERPLUS LCD REAR DISPLAY
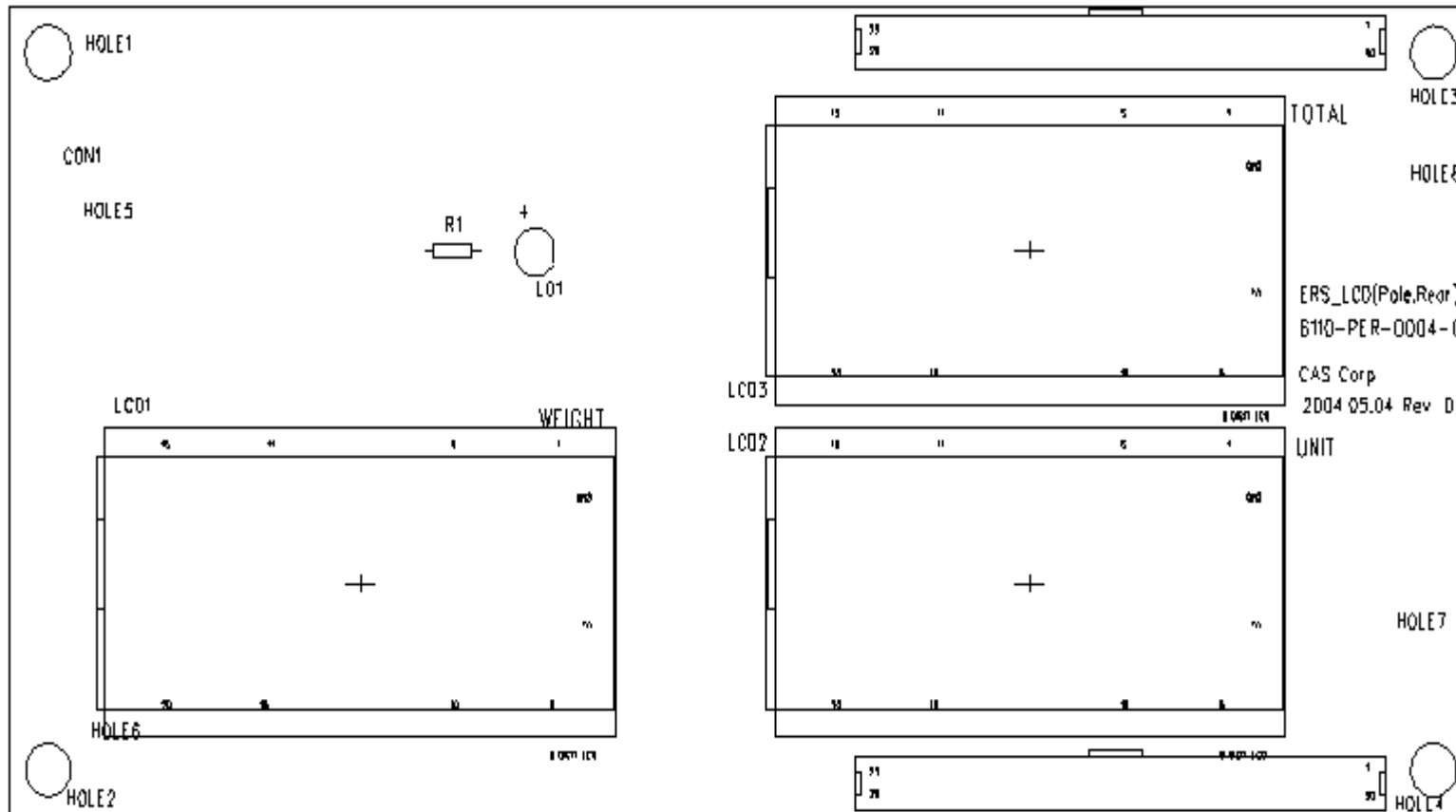
6.1.2. ER^{PLUS} VFD Version

6.1.2.1.   Main PCB Part Location

● **DRAWING NUMBER : 9000-ER1-0006**

ER^{PLUS} VFD MAIN
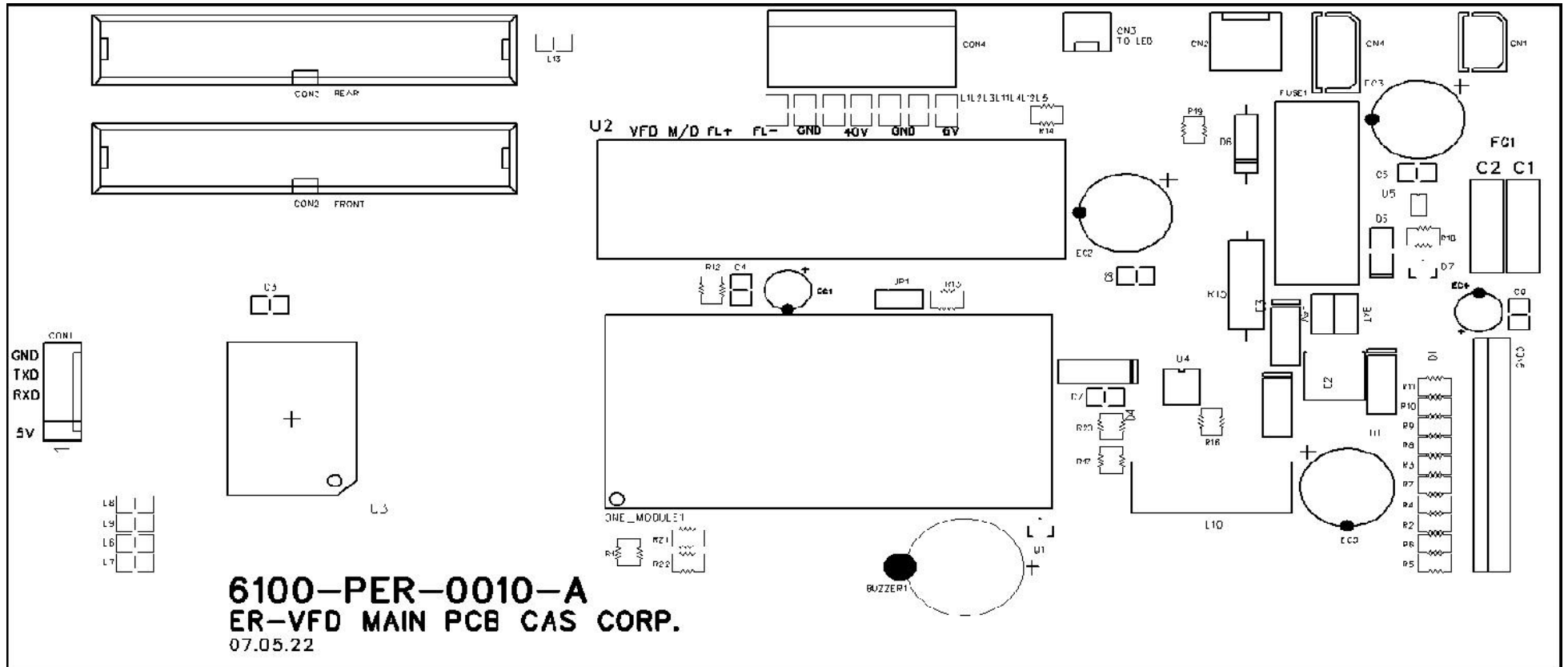
6.1.2.2. VFD FRONT DISPLAY PCB Part Location

● **DRAWING NUMBER : 9000-ER1-0007**

ER^{PLUS} VFD FRONT DISPLAY
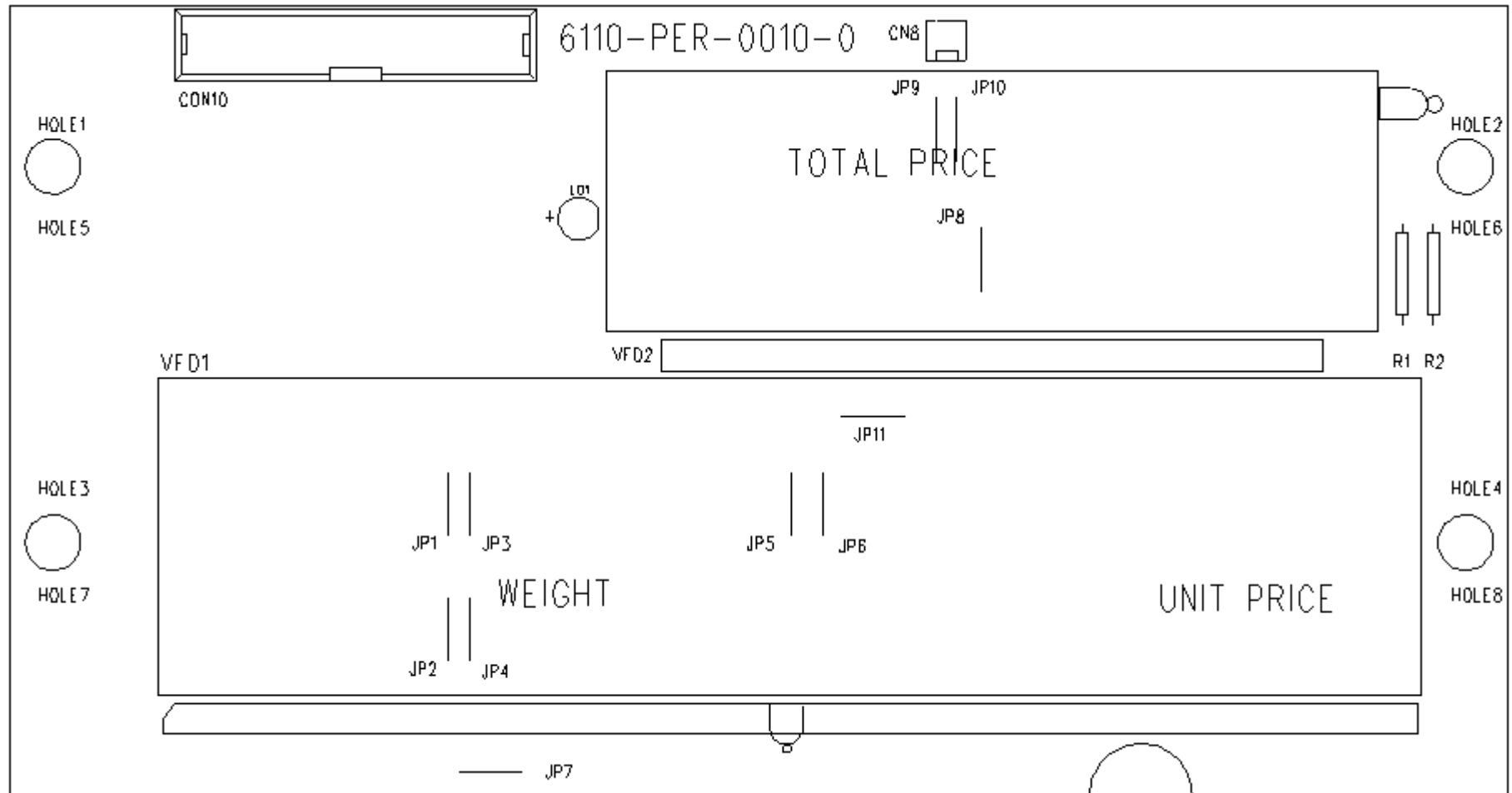
6.1.2.3.　　　VFD REAR DISPLAY PCB Part Location

● DRAWING NUMBER : 9000-ER1-0008

ER^{PLUS} VFD REAR DISPLAY
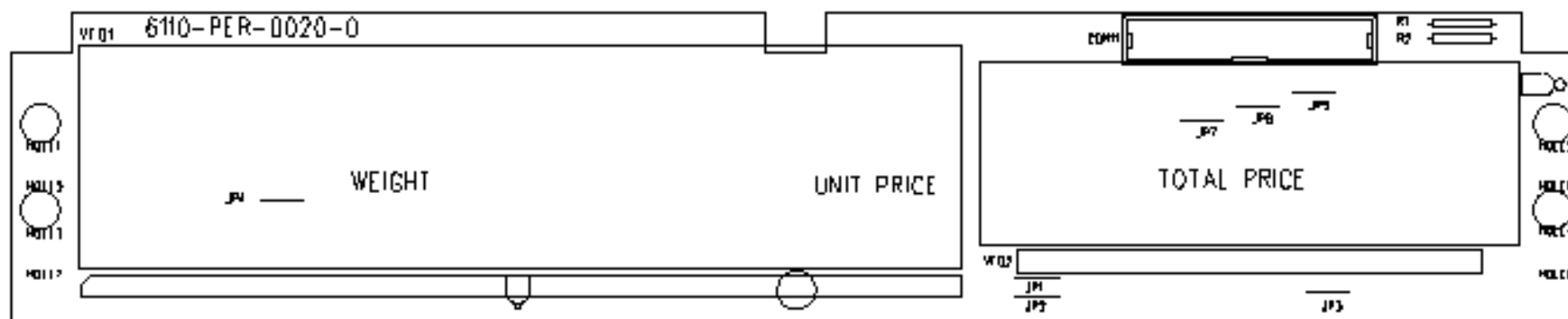
6.1.2.4.　　　POLE DISPLAY PCB Part Location

● **DRAWING NUMBER　:　9000-ER1-0009**

ER PLUS VFD POLE DISPLAY TYPE #1

CAS CORPORATION
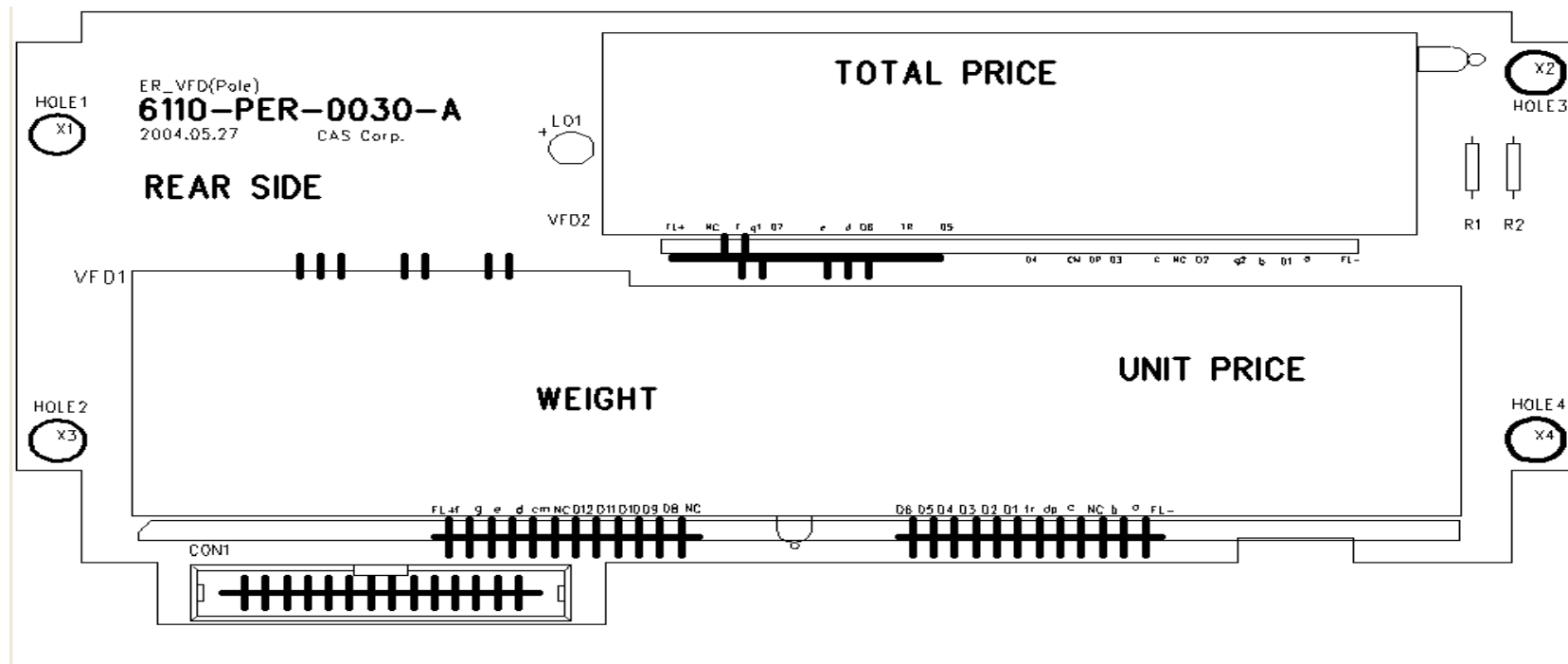
● **DRAWING NUMBER : 9000-ER1-0010**

ER^{PLUS} VFD POLE DISPLAY TYPE #2
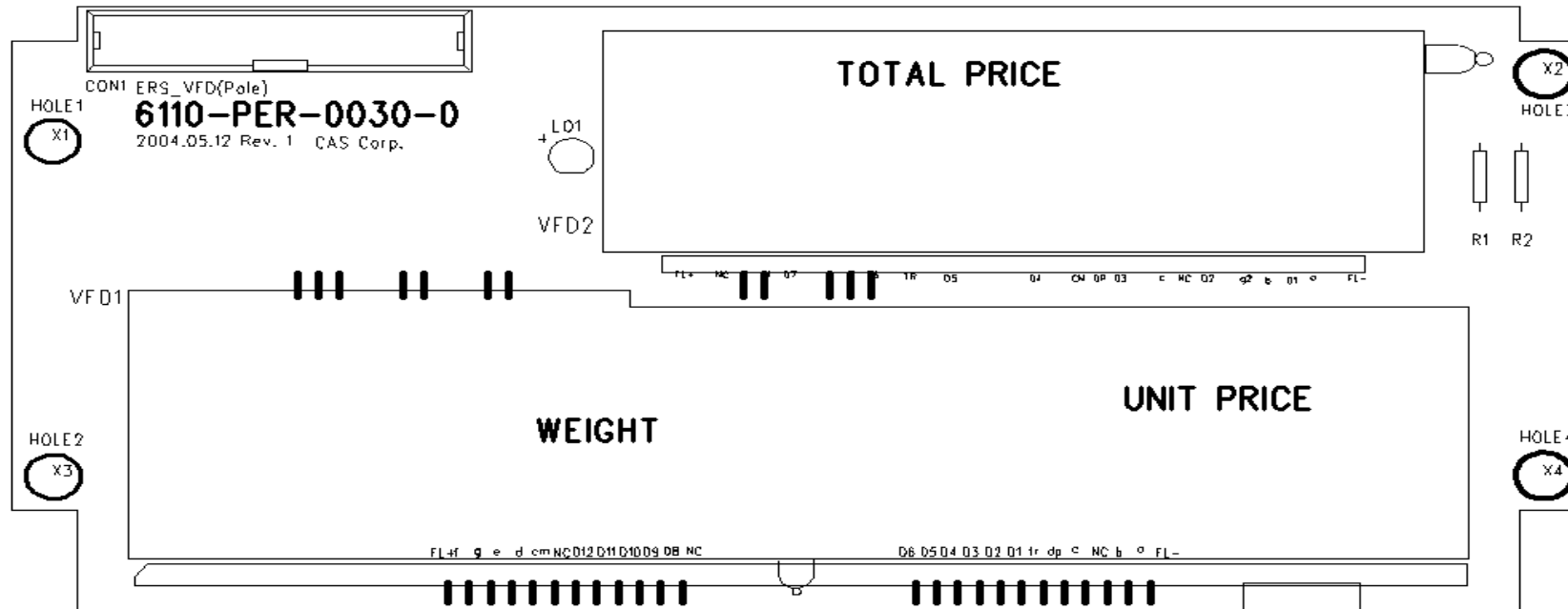
6.1.3. ERPLUS LED Version

6.1.3.1.　　Main PCB Part Location

● **DRAWING NUMBER ： 9000-ER2-0011**

ERPLUS LED Main

6100-PER-0100-A
ER-LED MAIN PCB 20070531
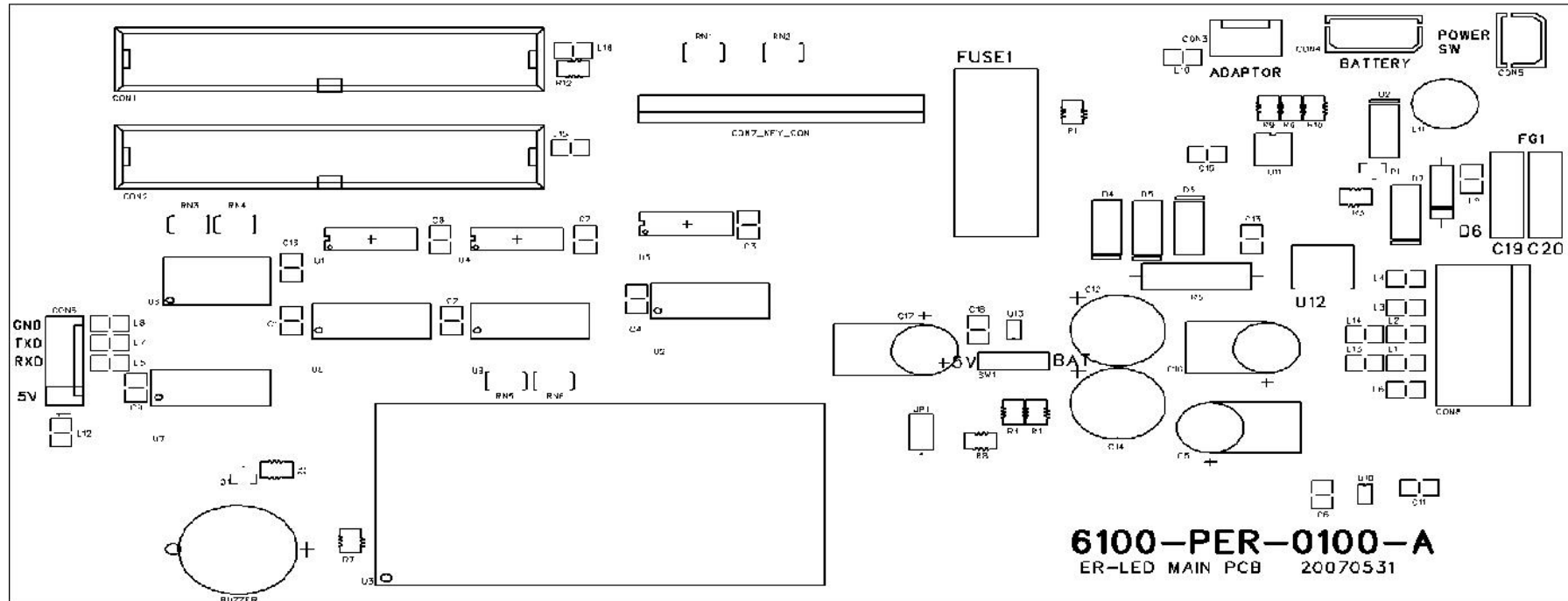
6.1.3.2. FRONT DISPLAY PCB Part Location

● **DRAWING NUMBER : 9000-ER2-0012**

ER^{PLUS} LCD FRONT DISPLAY
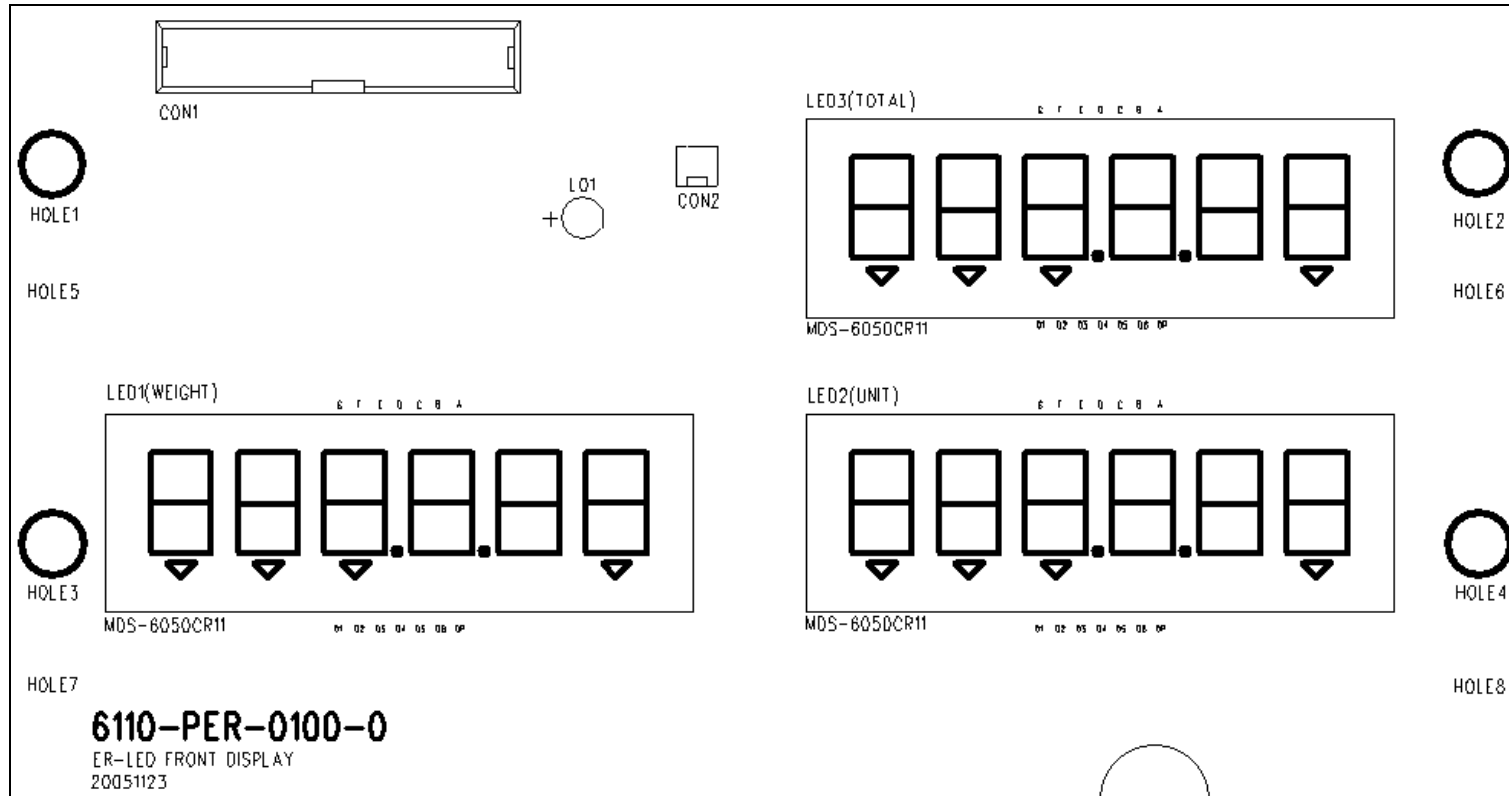
6.1.3.3. REAR DISPLAY PCB Part Location

● **DRAWING NUMBER : 9000-ER2-0013**

ER^{PLUS} LED REAR DISPLAY
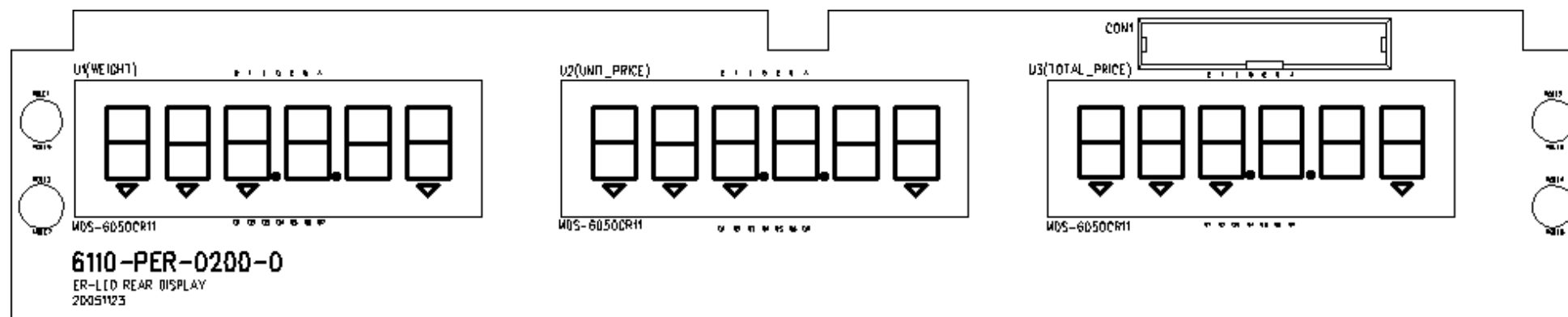
6.1.4. ER^{PLUS-M} LCD Version

6.1.4.1.   Main PCB Part Location

● **DRAWING NUMBER : 6100-PER-1001-0**
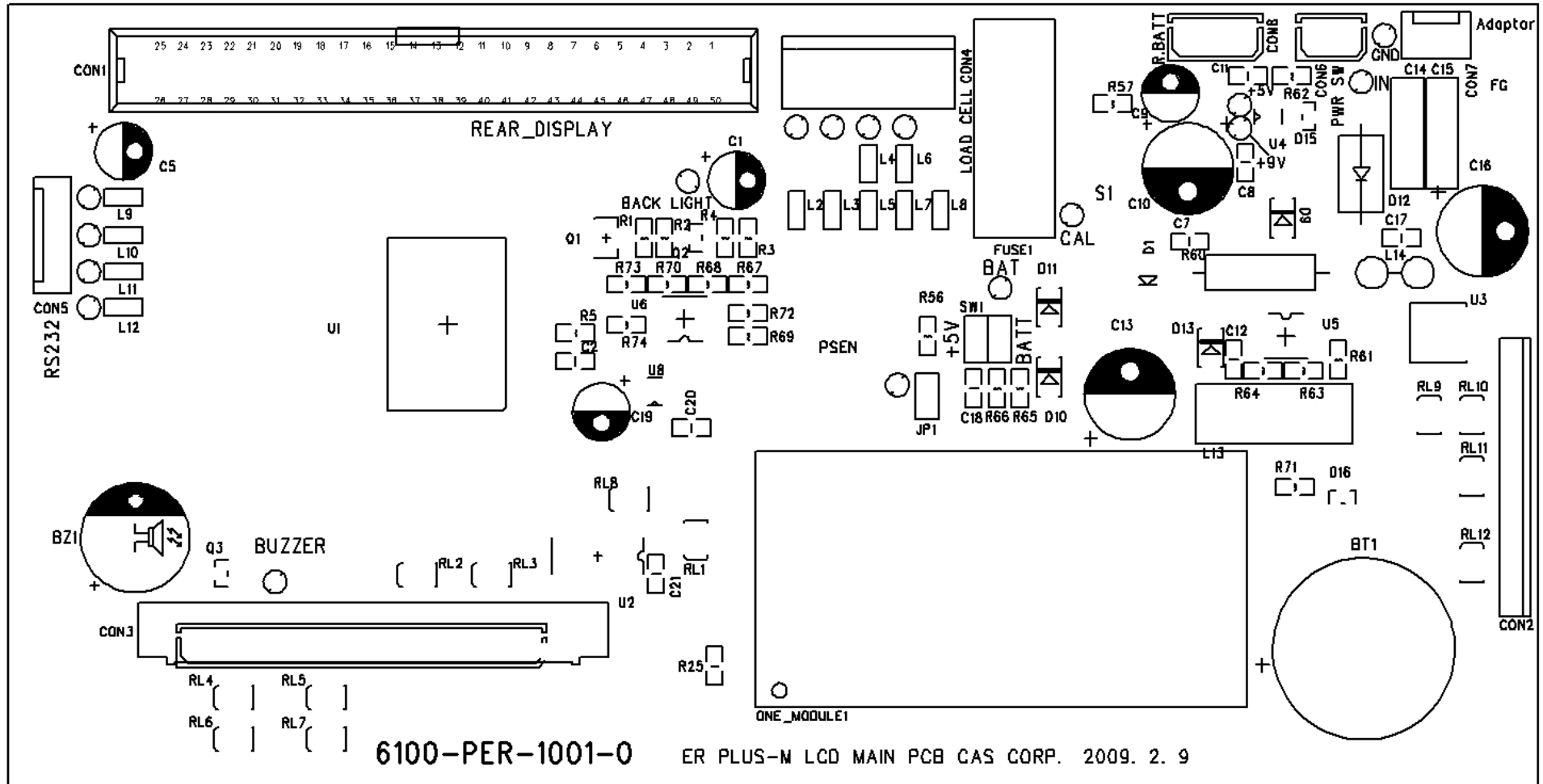
6.1.4.2.   **Front Display PCB Part Location**

● **DRAWING NUMBER : 6110-PER-1001-0**

6110-PER-1001-0

ER PLUS-M LCD POLE(FRONT DISP.)
2009. 2. 3   CAS Corp.

6.1.4.3. Rear Display PCB Part Location

● **DRAWING NUMBER** : **6110-PER-1002-0**

REAR_DISPLAY_CONNECTOR

6110-PER-1002-0

ER PLUS-M LCD POLE(REAR DISP.)

2009. 2. 3   CAS Corp.
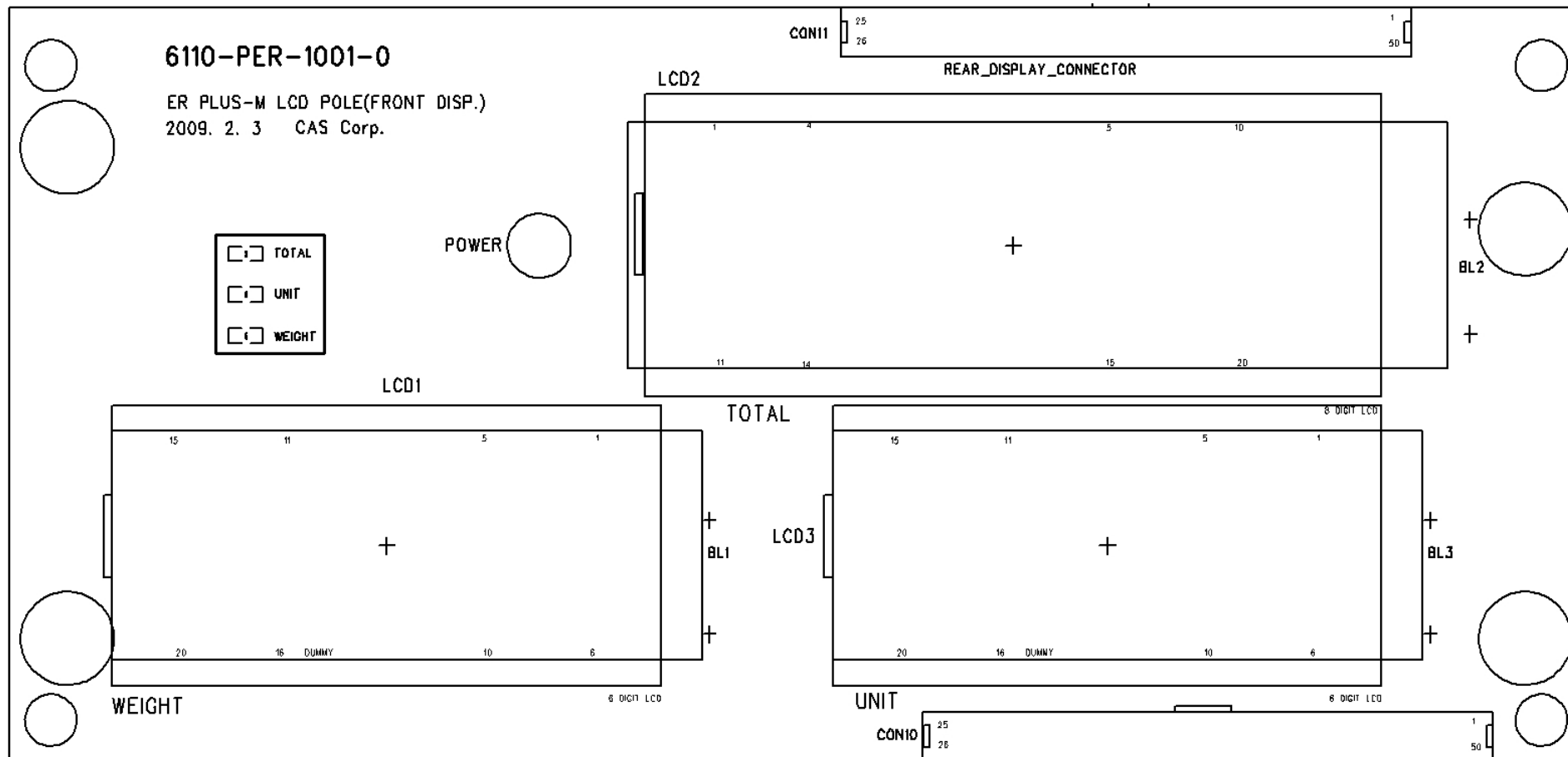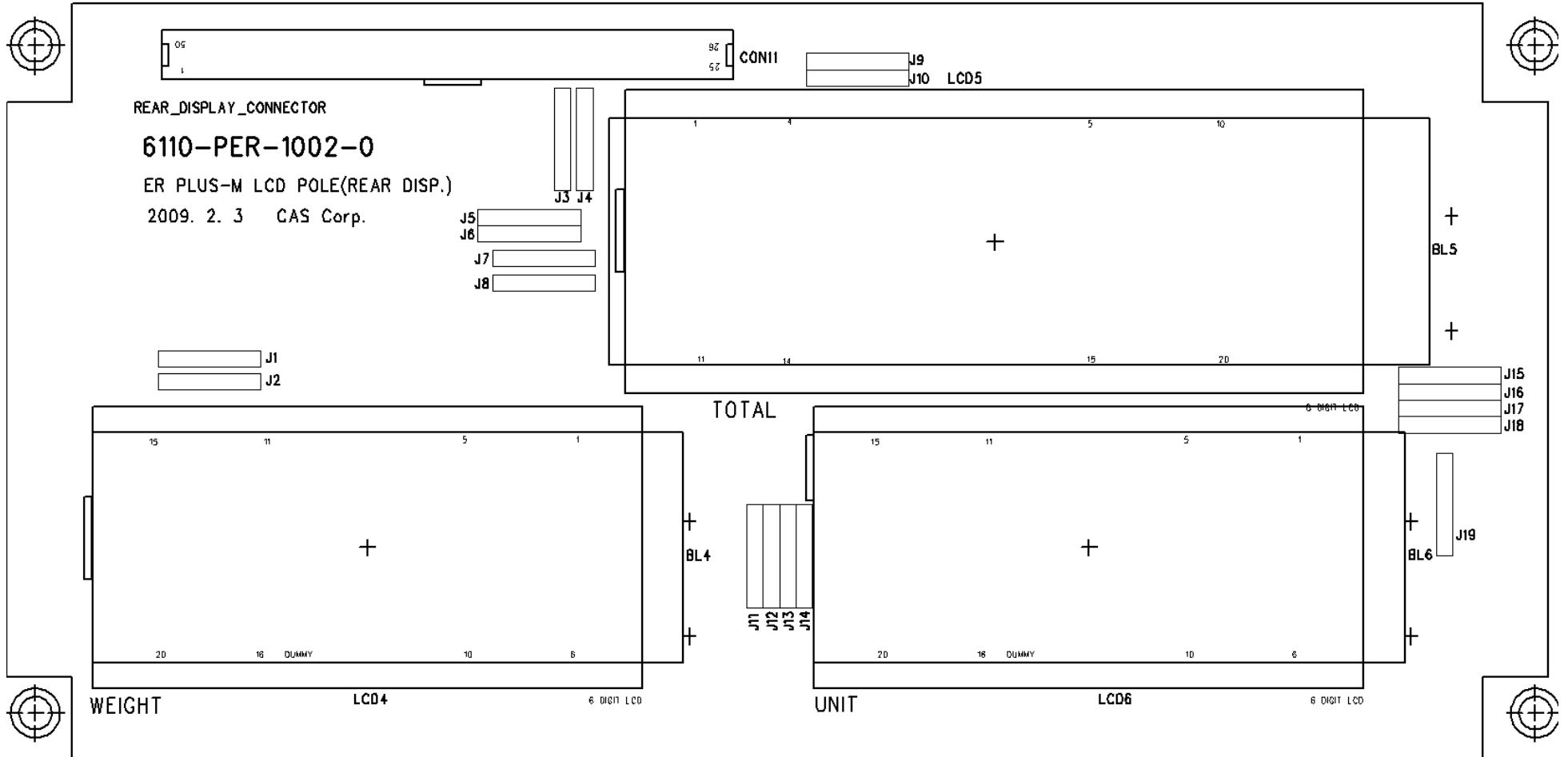
6.1.5. ER^{PLUS-M} LED Version

6.1.5.1. Main PCB Part Location

- **DRAWING NUMBER : 6100-PER-1100-0**

6100-PER-1100-0   ER PLUS-M LED MAIN PCB CAS CORP. 2009. 2. 18 (Ver.1.1)
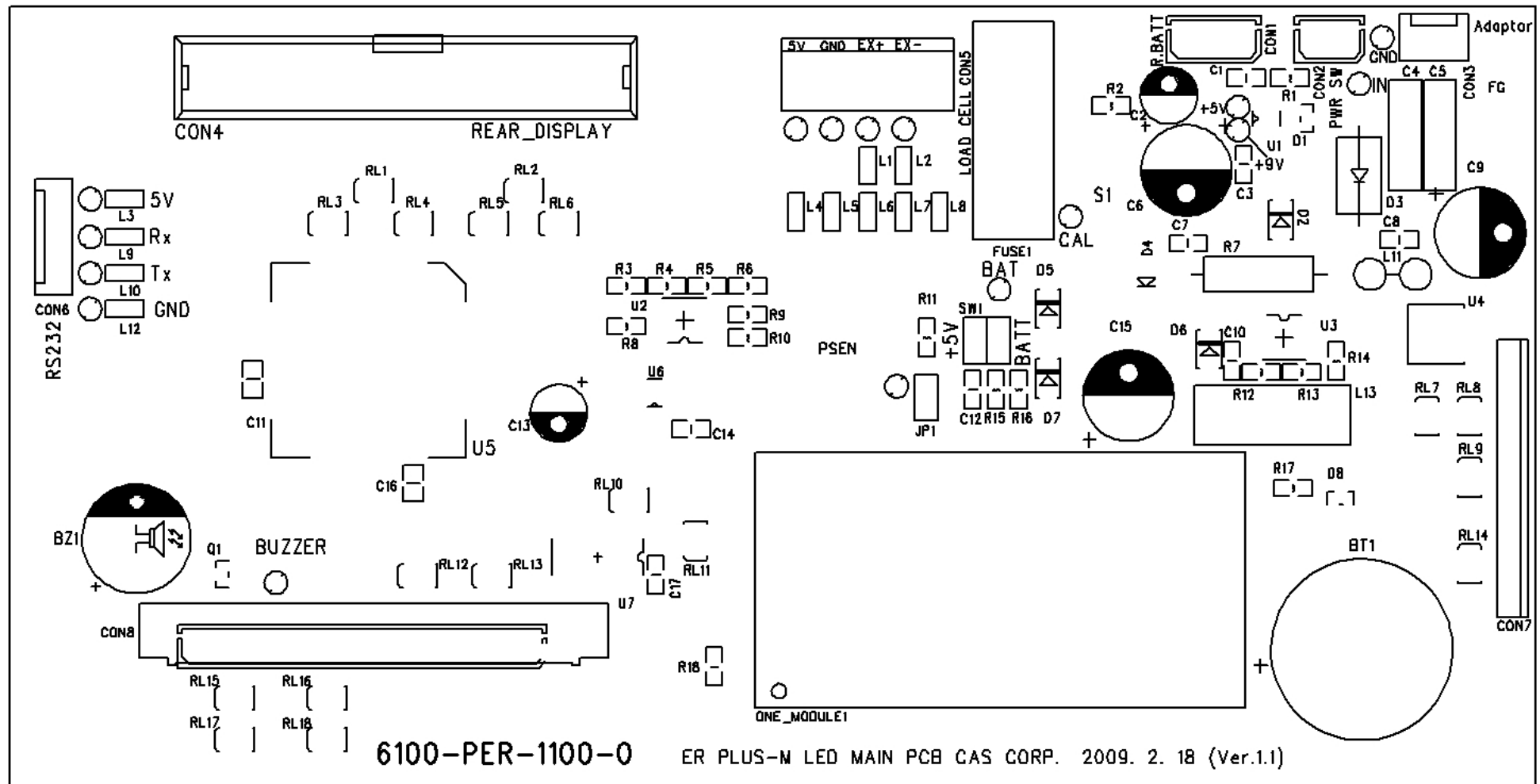
6.1.5.2.　　　Front Display PCB Part Location

● **DRAWING NUMBER　:　6110-PER-1100-0**

6110-PER-1100-0

ER PLUS-M LED POLE(FRONT DISP.)
2009. 2. 3　CAS Corp.

POWER

TOTAL

WEIGHT

UNIT

CON9

REAR_DISPLAY_CONNECTOR
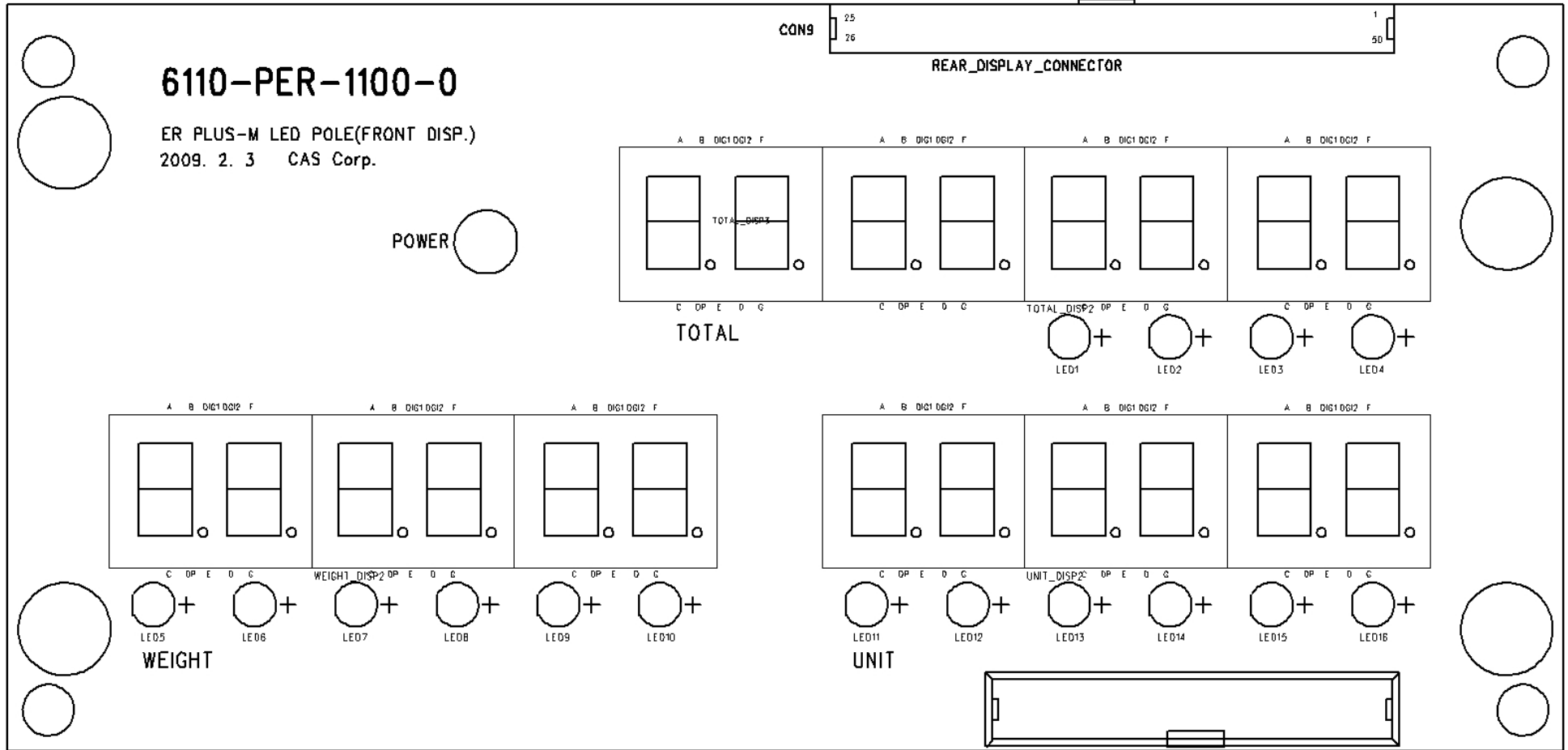
6.1.5.3. Rear Display PCB Part Location

● **DRAWING NUMBER : 6110-PER-1101-0**
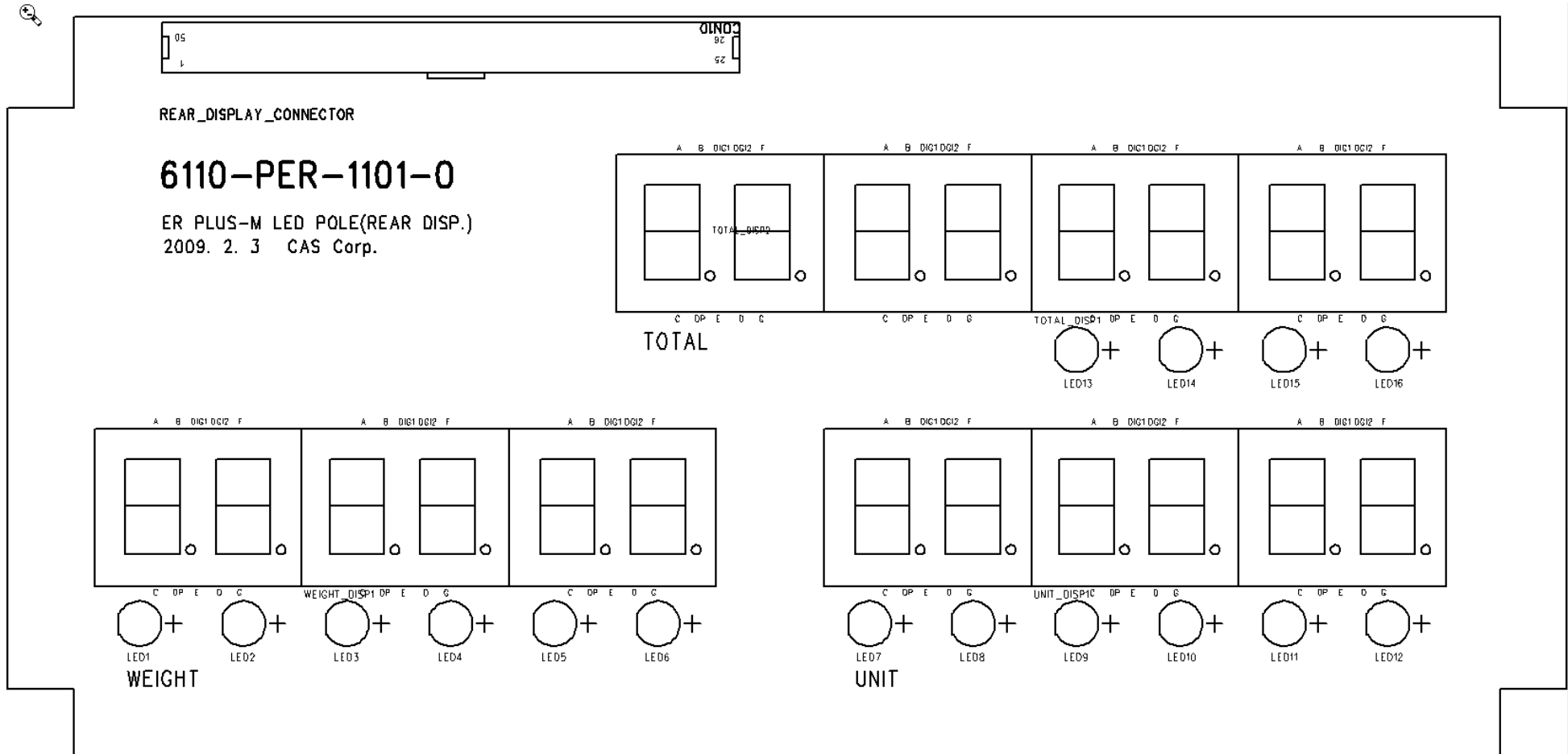
6.1.6. COMMON PCB.

6.1.6.1.　　RS-232 MODULE PCB Part Location

● DRAWING NUMBER　:　9000-ERS-0005

RS-232 PCB (TOP)

RS-232 PCB (BOTTOM)

　　　　　9/27/2010
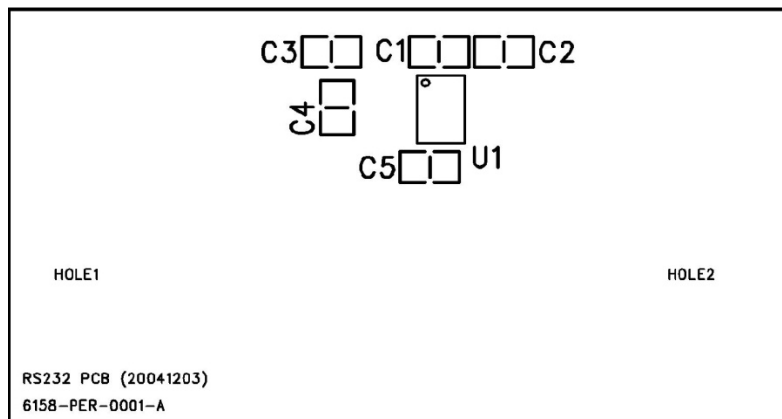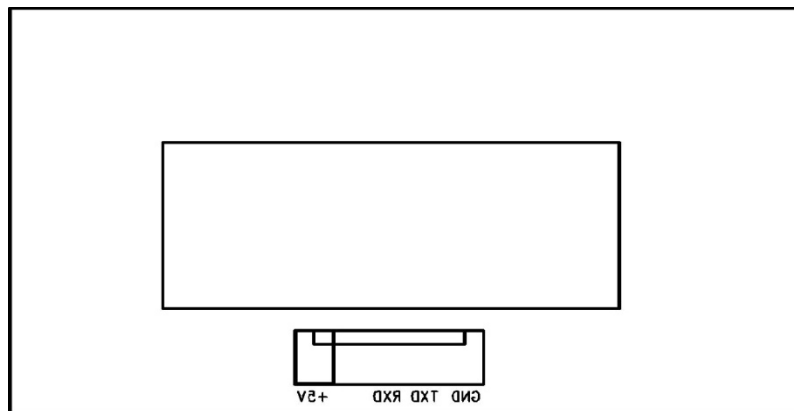
6.1.6.2.   KEY PCB Part Location (Pb)

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

KEY PCB
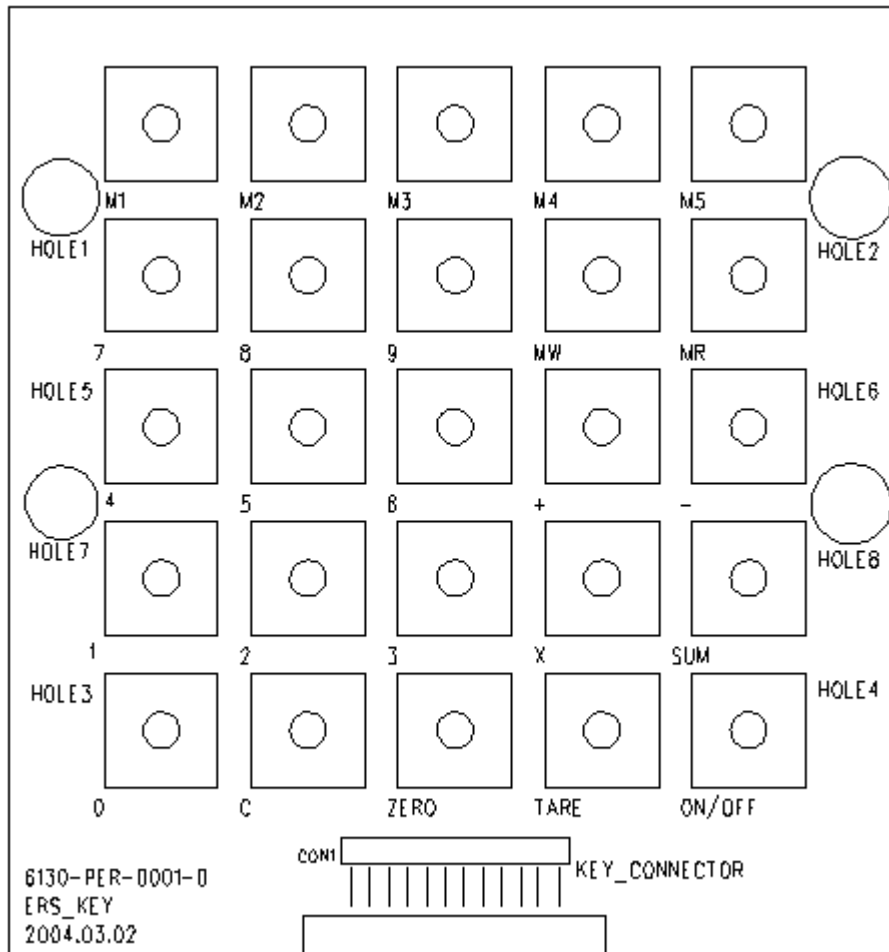
7. Error Messages & Solution

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

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 0.33Ω (±5%)	6512CJ000033	1	R9
15	RESISTOR-CHIP 1/10W	RR1220P-100D(10Ω)	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 10kΩ 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(유)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^PLUS(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(유)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 [110ER2EFDPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	FRONT DISPLAY PCB ASS'Y	ER2-15CB(LED)	110ER2EFDPUN0101	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^{PLUS}(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(유)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

1.1 MAIN PCB ASS'Y [110E20EMAPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	MAIN PCB ASS'Y	ER-15MCB(M_LCD_BACK LIGHT)		1	MAIN PCB ASS'Y
1	PCB-MAIN	6100-PER-1001-0(ER PLUS-CM)	6100PER10010	1	MAIN PCB
2	BATTERY	CR2032-3V(PIN TYPE)	7520P002032A	1	BT1
3	PIEZO BUZZER	APR,ADR(CHINA)	7002Z0000000	1	BZ1
4	CONDENSER-ELECTRIC	100uF/16V	6704C1601000	4	C1,C5,C9,C19
5	CONDENSER-ELECTRIC	470uF/35V(short type)	6704C3504700	3	C10,C13,C16
6	CONDENSER-CHIP	CL21F 471KBNC	6712CHP04710	1	C12
7	CONDENSER-CERAMIC	0.01uF/3KV	6710CAP0103B	2	C14,C15
8	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	8	C2,C7,C8,C11,C17,C18,C20,C21
9	SOCKET CONNECTOR	5332-50P	7813C000050B	1	CON1
10	CONNECTOR(WAFER)	LWL0640-12 (LSW250-12)	7802CLL00120	1	CON2
11	FPC CONNECTOR	FCZ254-16S	7807CFP00160	1	CON3
12	CONNECTOR(WAFER)	LW0640-05 (LPH01-05)	7801CLW00050	1	CON5
13	CONNECTOR(WAFER)	5273-02 (LPH03-02)	7804CCN73020	1	CON6
14	CONNECTOR(WAFER)	03-5267	7805CCN67030	1	CON7
15	CONNECTOR(WAFER)	5273-03 (LPH03-03)	7804CCN73030	1	CON8
16	DIODE-SWITCHING	PMLL4148L(LP-CONT')	6294ISW4148A	1	D1
17	DIODE-POWER	1N5406	6291IP054060	1	D12
18	DIODE-CHIP	KDS184	6294ICP01840	2	D15,D16
19	DIODE POWER	1N5819(SMD)	6291IS058190	4	D9,D10,D11,D13

20	GROUND WIRE	100mm(DB-Ⅱ)	7860GND01000	1	FG
21	FUSE	1.6A/250V ø5 UL,S,VDE,BSI(유) fast blow type	7620S0516000	1	FUSE1
22	FUSE HOLDER	GF-205B(EXP-300L)	7630S0002050	1	FUSE1
23	JUMPER	2PIN	7821CJM00020	3	JP1,BAT,+5V
24	EMI BEAD FILTER	BFD-3565 R2	6800F003565A	1	L14
25	INDUCTANCE	220uH(NT SERIES)	6670T0102200	1	L13
26	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	6670T0001020	11	L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12
27	TRANSISTOR CHIP	KTA1666	6281I0016660	1	Q1
28	TRANSISTOR CHIP	2N2222AS	6281I0022220	1	Q2
29	TRANSISTOR CHIP	KTA1504 SY	6281I0015040	1	Q3
30	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6527ID310000	6	R1,R4,R62,R65,R72,R73
31	RESISTOR-CHIP 1/10W	RR1220P-592D(5.9K)	6527ID300590	1	R2
32	RESISTOR-CHIP 1/10W	RR1220P-100D(10Ω)	6527ID001000	1	R25
33	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	6527ID301000	4	R3,R56,R61,R70
34	RESISTOR-CHIP 1/10W	RR1220P-202D(2K)	6527ID300200	4	R5,R63,R69,R74
35	RESISTOR-CHIP 1/10W	RR1220P-222D(2.2K)	6527ID300220	1	R5
36	RESISTOR-CHIP 1/10W	RR1220P-101D(100Ω)	6527ID010000	1	R52
37	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7K)	6527ID300470	2	R57,R71
38	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	6527ID300100	1	R66
39	RESISTOR 2W	CFR 0.33Ω (±5%)	6512CJ000033	1	R60
40	RESISTOR-CHIP 1/10W	RR1220P-470D(47Ω)	6527ID004700	1	R64
41	RESISTOR-CHIP 1/10W	RR1220P-333D(33K)	6527ID303300	1	R67
42	RESISTOR-CHIP 1/10W	RR1220P-562D(5.6K)	6527ID300560	1	R68

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43	RESISTOR-CHIP-ARRAY	RP164P103J(=1608 10k)	6598IJ301000	4	RL1. RL6, RL7, RL9
44	RESISTOR-CHIP-ARRAY	RP164P101J(=1608 100Ω * 4PCS)	6598IJ010000	8	RL2, RL3, RL4, RL5, RL8, RL10, RL11, RL12
45	TACT S/W	11902(DJTA-1102)	7600STA19020	1	S1
46	IC(LCD DRIVER)	HOLTEX HT1622 (ERS-LCD)	6224I0016220	1	U1
47	IC	74HC138(LP-II)	6236IS001380	1	U2
48	IC(REGULATOR)	KA7809A(D-PACK)	6220IS078090	1	U3
49	IC(REGULATOR)	XC6204C502MR(5.0V)	6220IS0C5020	2	U4,U8
50	IC(DC DC CONVERTER)	MC34063AD	6242I003406A	1	U5
51	IC	LM393D(SOP)	6241IS003930	1	U6
52	ONE MODULE	ONE MODULE	6PA0A0000010	1	U7

1.2 DISPLAY PCB ASS'Y [110ER3EFDPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	DISPLAY PCB ASS'Y	ER-15MCB(M_LCD_BACKLIGHT)		1	DISPLAY PCB ASS'Y
1	PCB-FRONT	6110-PER-1001-0(ER PLUS-CM)(F)	6110PER10010	1	ER PLUS-M LCD FRONT DISPLAY
2	PCB-REAR	6110-PER-1002-0(ER PLUS-CM)(R)	6110PER10020	1	ER PLUS-M LCD REAR DISPLAY
3	LED HOLDER	6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	POWER
4	LED LAMP	ø5-(R,G) BL-BVT 204	7232DRG00050	1	POWER
5	LCD 6DIGIT	2512STF-P(ER-LCD,BACK LIGHT 용)	7212D0025120	4	LCD1, LCD3, LCD4, LCD6
6	LCD 8DIGIT	HT-7231(ER PLUS M 8 자리 LCD)	7212D0072310	2	LCD2, LCD5
7	LED BACK LIGHT	ER PLUS-M LCD,6 digit 용(녹색)	7224D0000050	4	BL1, BL3, BL4, BL6
8	LED BACK LIGHT	ER PLUS-M LCD,8 digit 용(녹색)	7224D0000040	2	BL2, BL5
9	JUMP WIRE	ø0.6*10m/m	7844W0001000	19	J1~J19

10	FLAT CABLE CONNECTOR	50P*50P*1160mm(ER PLUS LCD)	7850W00A1160	1	CON10
11	FLAT CABLE CONNECTOR	50P*50P*35mm(ER PLUS M LCD)	7850W00C0350	1	CON11

1.3 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

1.4 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

ER^{PLUS-M}(LED) PART LIST

1.1 MAIN PCB ASS'Y [110E20EMAPUN0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	MAIN PCB ASS'Y	**ER-15MEB(M_LED)**		**1**	**MAIN PCB ASS'Y**
1	BATTERY	CR2032-3V(PIN TYPE)	7520P002032A	1	BT1
2	PIEZO BUZZER	APR,ADR(CHINA)	7002Z0000000	1	BZ1
3	CONDENSER-ELECTRIC	100uF/16V	6704C1601000	2	C2, C13
4	CONDENSER-ELECTRIC	470uF/35V(short type)	6704C3504700	3	C6,C9,C15
5	CONDENSER-CHIP	CL21F 471KBNC	6712CHP04710	1	C10
6	CONDENSER-CERAMIC	0.01uF/3KV	6710CAP0103B	2	C4,C5
7	CONDENSER-CHIP	CL21F 104KBNC	6712CHP01040	9	C1,C3,C7,C8,C11,C12,C14,C16,C17
8	CONNECTOR(WAFER)	34PIN		1	CON4
9	CONNECTOR(WAFER)	LWL0640-12 (LSW250-12)	7802CLL00120	1	CON7
10	FPC CONNECTOR	FCZ254-16S	7807CFP00160	1	CON8
11	CONNECTOR(WAFER)	LW0640-05 (LPH01-05)	7801CLW00050	1	CON6
12	CONNECTOR(WAFER)	5273-02 (LPH03-02)	7804CCN73020	1	CON2
13	CONNECTOR(WAFER)	03-5267	7805CCN67030	1	CON3
14	CONNECTOR(WAFER)	5273-03 (LPH03-03)	7804CCN73030	1	CON1
15	DIODE-SWITCHING	PMLL4148L(LP-CONT')	6294ISW4148A	1	D4
16	DIODE-POWER	1N5406	6291IP054060	1	D3
17	DIODE-CHIP	KDS184	6294ICP01840	2	D1,D8
18	DIODE POWER	1N5819(SMD)	6291IS058190	4	D2,D5,D6,D7

19	GROUND WIRE	100mm(DB-Ⅱ)	7860GND01000	1	FG
20	FUSE	1.6A/250V ø5 UL,S,VDE,BSI(유) fast blow type	7620S0516000	1	FUSE1
21	FUSE HOLDER	GF-205B(EXP-300L)	7630S0002050	1	FUSE1
22	JUMPER	2PIN	7821CJM00020	3	JP1,BAT,+5V
23	INDUCTANCE	220uH(NT SERIES)	6670T0102200	1	L13
24	EMI BEAD FILTER	BFD-3565 R2	6800F003565A	1	L11
25	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	6670T0001020	7	L1,L2,L4,L5,L6,L7,L8
26	PCB-MAIN	6100-PER-1100-0(ER PLUS-EM)	6100PER10010	1	MAIN PCB
27	TRANSISTOR CHIP	KTA1504 SY	6281I0015040	1	Q1
28	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6527ID310000	4	R1,R3,R9,R16
29	RESISTOR-CHIP 1/10W	RR1220P-100D(10Ω)	6527ID001000	1	R18
30	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	6527ID301000	3	R4,R11,R14
31	RESISTOR-CHIP 1/10W	RR1220P-202D(2K)	6527ID300200	3	R8,R10,R13
32	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7K)	6527ID300470	2	R2,R17
33	RESISTOR 2W	CFR 0.33Ω (±5%)	6512CJ000033	1	R7
34	RESISTOR-CHIP 1/10W	RR1220P-470D(47Ω)	6527ID004700	1	R12
35	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	6527ID300100	1	R15
36	RESISTOR-CHIP 1/10W	RR1220P-333D(33K)	6527ID303300	1	R6
37	RESISTOR-CHIP 1/10W	RR1220P-562D(5.6K)	6527ID300560	1	R5
38	RESISTOR-CHIP-ARRAY	RP164P103J(=1608 10k)	6598IJ301000	4	RL7,RL11,RL17,RL18
39	RESISTOR-CHIP-ARRAY	RP164P101J(=1608 100Ω * 4PCS)	6598IJ010000	8	RL8,RL9,RL10,RL12,RL13,RL14,RL15,RL16
40	RESISTOR-CHIP-ARRAY	180Ω		6	RL1,RL2,RL3,RL4,RL5,RL6
41	TACT S/W	11902(DJTA-1102)	7600STA19020	1	S1

42	IC(LCD DRIVER)	HOLTEX HT1632C (ER-LED)		1	U5
43	IC	74HC138(LP-II)	6236IS001380	1	U7
44	IC(REGULATOR)	KA7809A(D-PACK)	6220IS078090	1	U4
45	IC(REGULATOR)	XC6204C502MR(5.0V)	6220IS0C5020	2	U1
46	IC(REGULATOR)	XC6204G502MR(5.0V)			U6
47	IC(DC DC CONVERTER)	MC34063AD	6242I003406A	1	U3
48	IC	LM393D(SOP)	6241IS003930	1	U2
49	ONE MODULE	ONE MODULE	6PA0A0000010	1	U7

1.2 DISPLAY PCB ASS'Y [110ER3EFDPPH0101]

No	Part Name	Specification	Part Number	Q'ty	Remark
	DISPLAY PCB ASS'Y	**ER-15MEB(M_LED)**		**1**	**DISPLAY PCB ASS'Y**
1	**PCB-FRONT**	**6110-PER-1101-0(ER PLUS-EM)(F)**	**6110PER10010**	**1**	**ER PLUS-M LCD FRONT DISPLAY**
2	**PCB-REAR**	**6110-PER-1102-0(ER PLUS-EM)(R)**	**6110PER10020**	**1**	**ER PLUS-M LCD REAR DISPLAY**
3	LED HOLDER	µg6*5*5mm(DB-IIVFD,ER)	2090H0000100	1	POWER
4	LED LAMP	ø5-(R,G) BL-BVT 204	7232DRG00050	1	POWER
5	LED	MDS-1056AR11(ANODE)	7230D00A1050	40	
6	LED	MDS-6050CR11(ANODE)	7230D00A6500	6	
7	FLAT CABLE CONNECTOR	34P*34P*1160mm(ER PLUS LED)	7850W00A1160	1	CON11
8	FLAT CABLE CONNECTOR	50P*50P*35mm(ER PLUS M LCD)	7850W00C0350	2	CON9, CON10

1.3 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

1.4 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