EB 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.

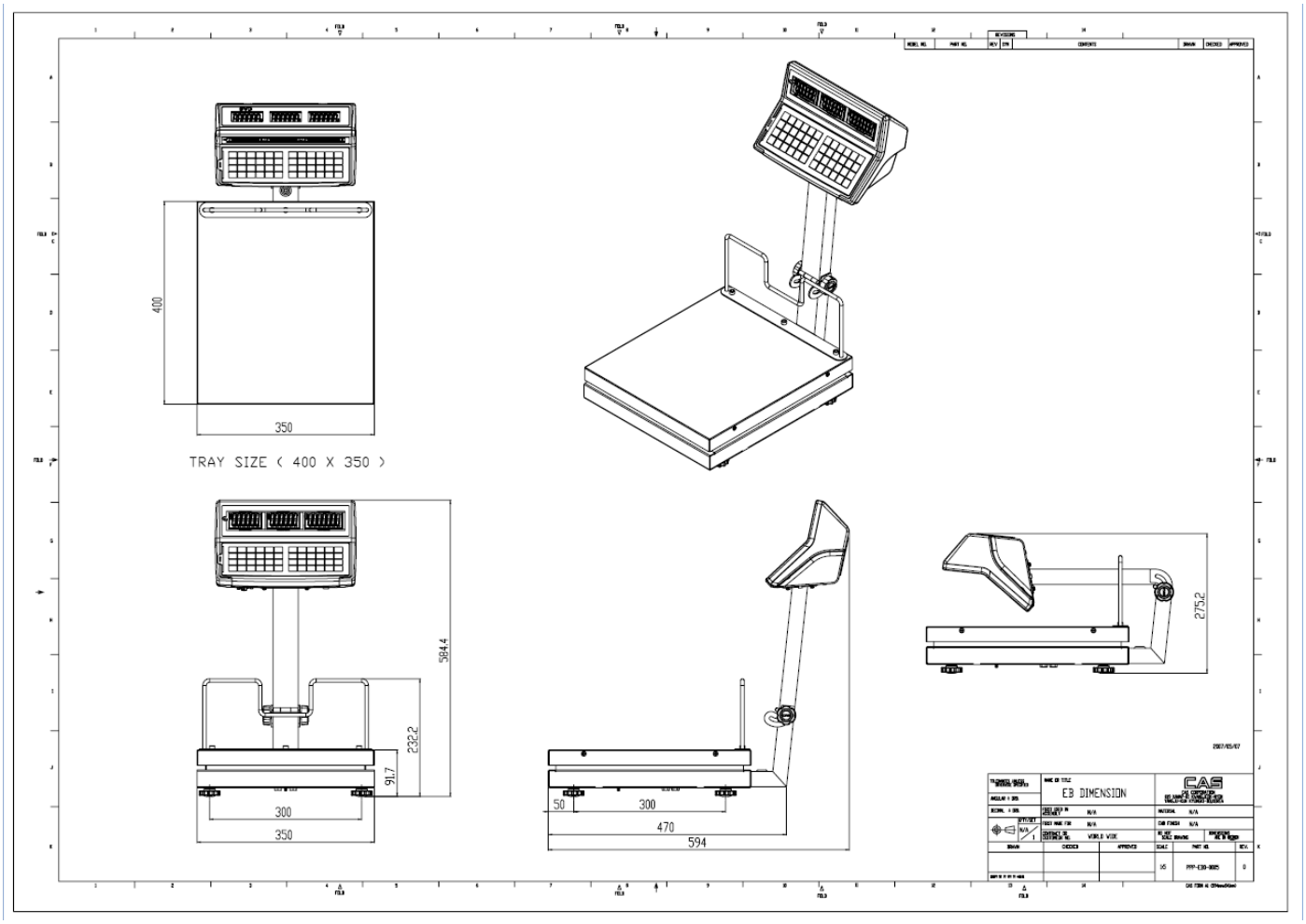
1.2. Precaution

- 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. Specifications

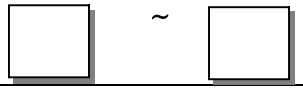
	EB -60	EB-150
Capacity / e	60 kg / 0.02 kg	150 kg / 0.5 kg
Internal	1 / 60,000	1 / 60,000
External	1/3,000 (Dual)	1/3,000 (Dual)
Tare	29.99 Kg	59.98 Kg
Display	Weight(6), unit price(6), total price(6)	
Indicators	STABLE, ZERO, NET, Battery	
Keys	Number(0~9, 00), Clear, ZERO, TARE, PLU Save, PLU Call, Battery, BL, X, -(cancel), +(add), SUM(TTP), Mode, Power ON/OFF	
Functions	• Direct PLU(24) / Indirect PLU(200) • Price computing scale • Low Battery Indication function • Auto Power Off, Auto BL off • Beep Sound Off Function	
Weight	15kg	
Power	6V 5 Ah Pb Battery or 9 V Adaptor	
Op.Temperature	- 10 °C ~ +40 °C	
Options	Rear Display, Stainless-tray, Adaptor, RS232	
Minimum Voltage Level The Battery	About 5.7V	
Operation time	About 200HR	

1.4. Dimension



1.5. Key & SYMBOLS ON DISPLAY

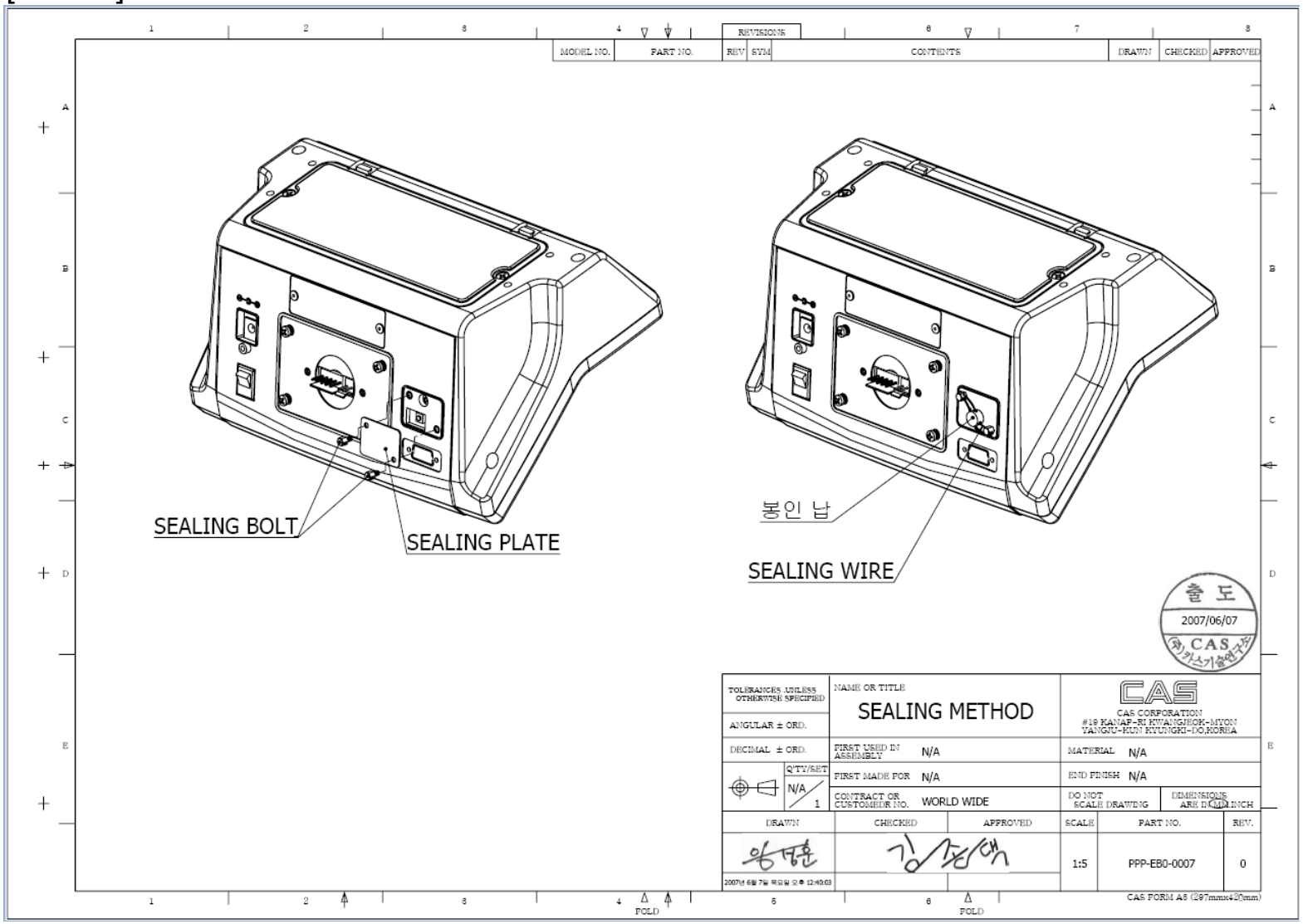
SYMBOLS	DESCRIPTION
	To adjust zero
	Stable status
	Tare on
	Charge status
	Display battery status
	Back Light On status

KEYS	FUNCTIONS
	To input all of numerical data
	Direct PLU keys (24EA)
	To save PLU
	To call up PLU

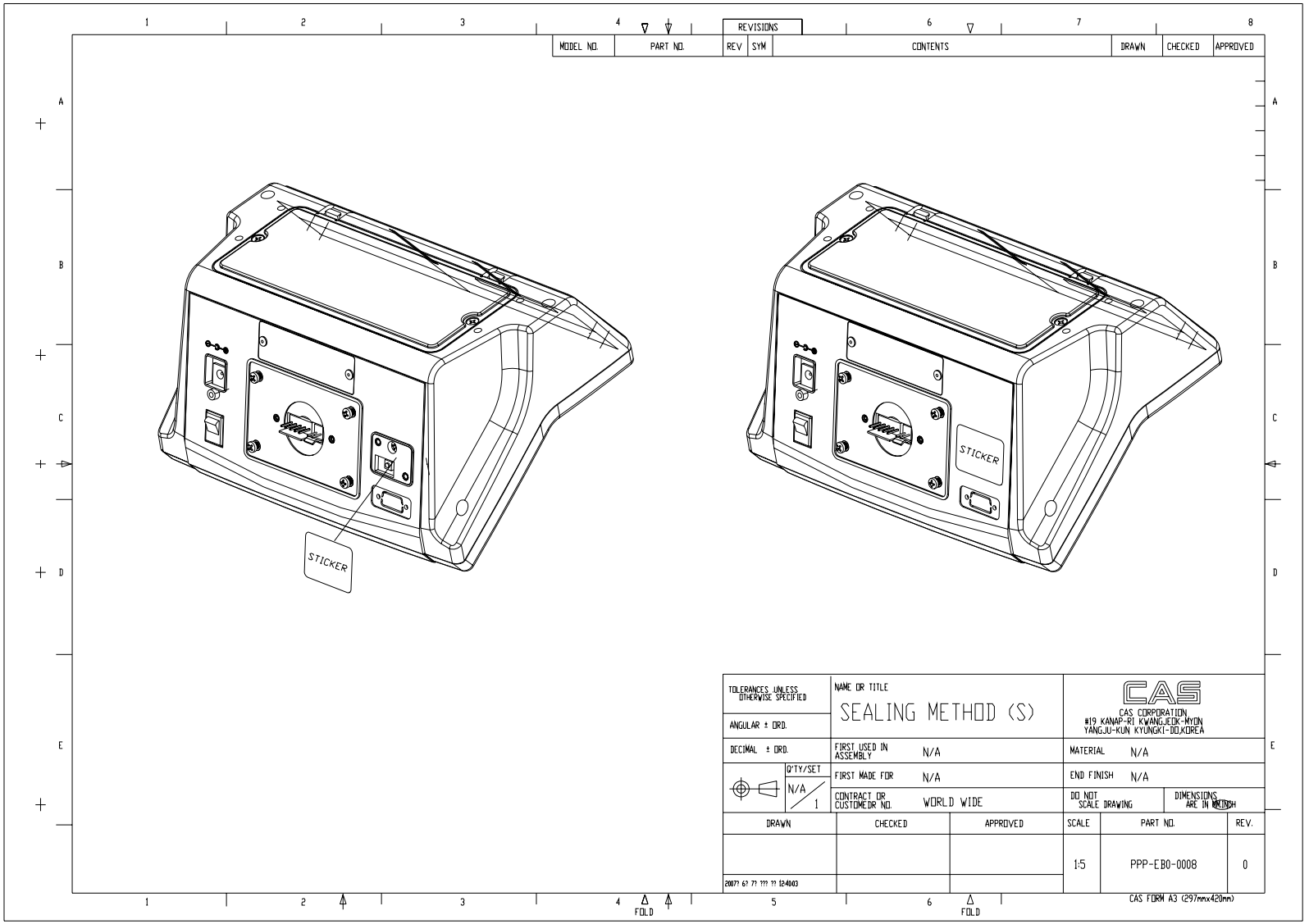
C	To clear data
→0←	To set zero
→T←	To set or clear tare value
⏻	To turn on & off the scale
☼	To turn on & off the backlight
	Display battery voltage(%)
+	To make several sales transaction by adding up
−	To make discount transaction
×	To multiply the same item when making sales transaction
Σ	To check total sales amount or finalize sales transaction
*	To soft key

1.6. Sealing Method

[PLATE]



[STICKER]


REVISIONS
MODEL NO.
PART NO.
REV
SYM
CONTENTS
DRAWN
CHECKED
APPROVED
STICKER
STICKER
TOLERANCES UNLESS OTHERWISE SPECIFIED
ANGULAR ± DRD.
DECIMAL ± DRD.
NAME OR TITLE
SEALING METHOD (S)
CAS CORPORATION
#19 KANAP-RI KWANGJEOK-MYON
YANGJU-KUN KYUNGKI-DO,KOREA
FIRST USED IN ASSEMBLY N/A
MATERIAL N/A
FIRST MADE FOR N/A
END FINISH N/A
Q'TY/SET
N/A
1
CONTRACT OR CUSTOMEDR NO. WORLD WIDE
DO NOT SCALE DRAWING
DIMENSIONS ARE IN MM/INCH
DRAWN
CHECKED
APPROVED
SCALE
PART NO.
REV.
1:5
PPP-EB0-0008
0
CAS FORM A3 (297mmx420mm)
FOLD
FOLD

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 infomation-
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)

2.1.1.C4 Setting

2.1.1.1. 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			

2.1.1.2. 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

2.1.1.3. 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	Price decimal point	7	Special case
		6	O.OOOOOO
		5	O.OOOOO

		4	0.0000
		3	0.000
		2	0.00
		1	0.0
		0	0
BIT3	Use Unit message	0	Don't use
		1	Use
BIT2			
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'.

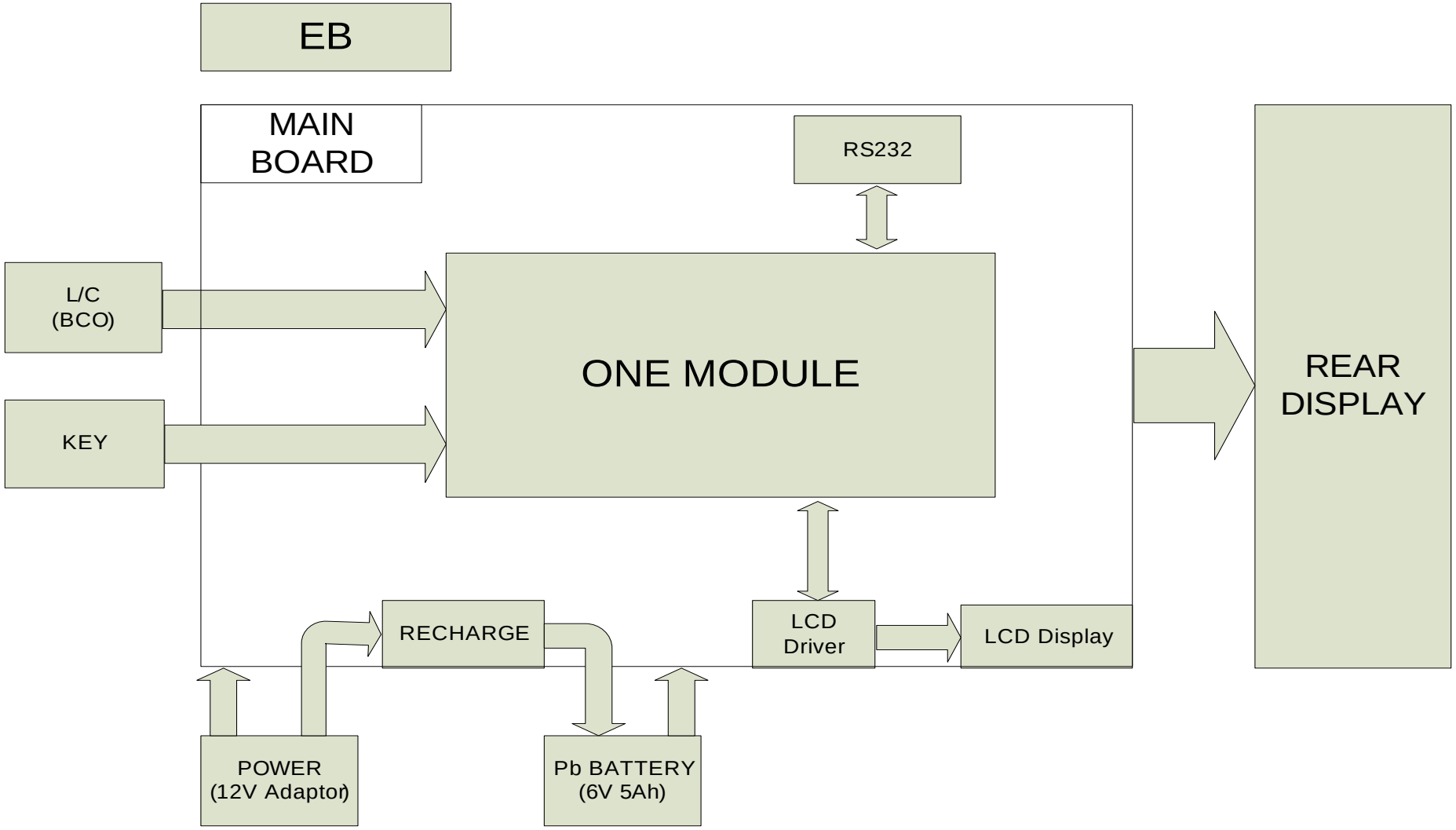
(5) Press [ZERO] key two times and then Press [-] key two times.
And then it display '500'

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

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

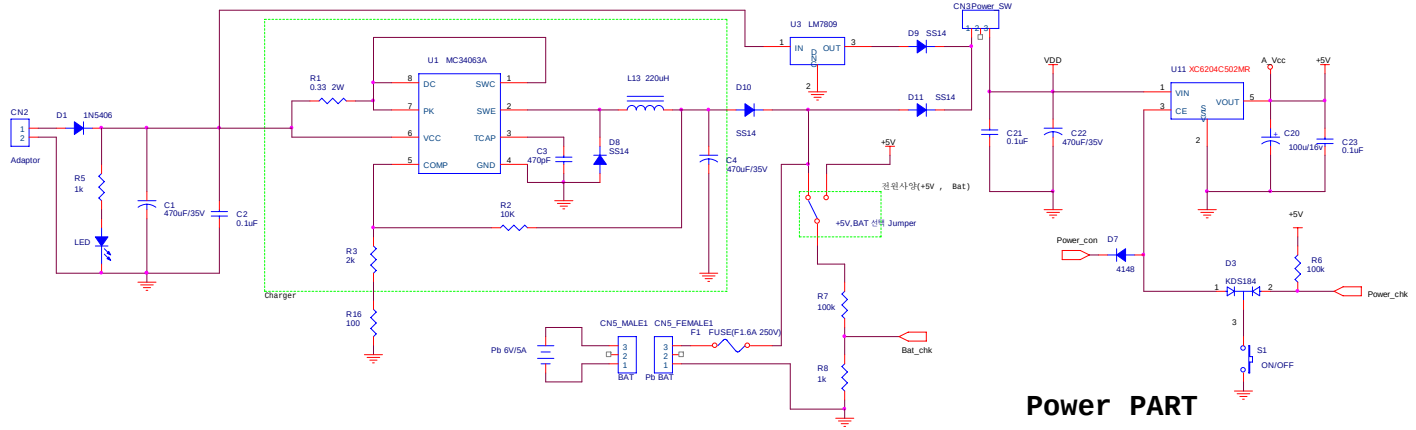
3. The Schematics and Diagram

3.1. System Block Diagram

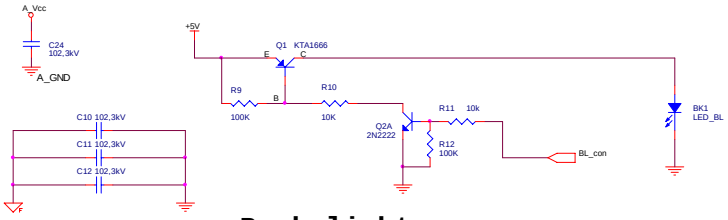


3.2. Circuit Diagram

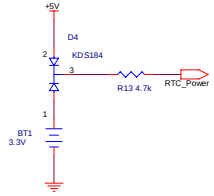
3.2.1. Main and Power

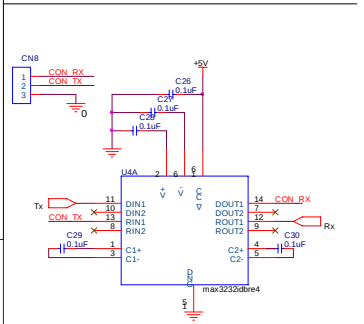


Power PART

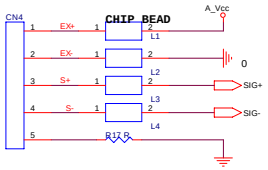


Back light

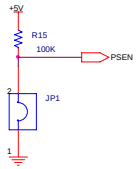




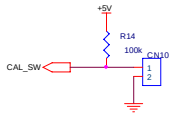
RS232 DRIVER PART



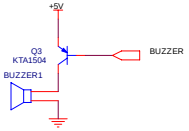
LOADCELL PART



PROGRAM PART



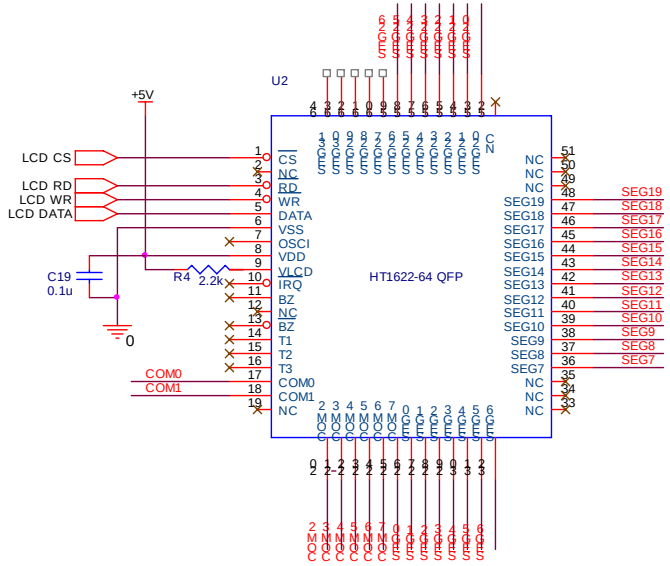
CAL PART

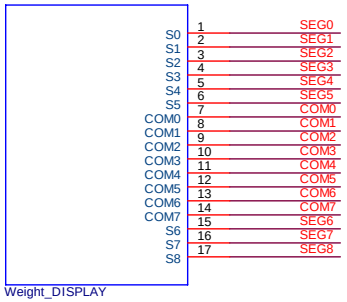


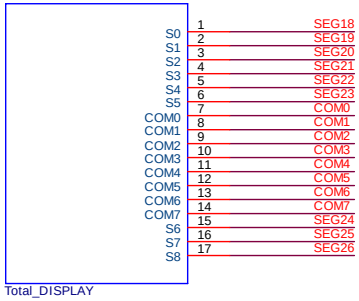
BUZZER PART

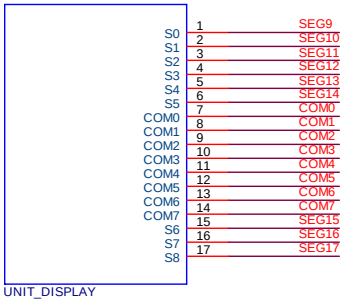
Title	EB (MODULE VER.)	
Size A3	Document Number <Doc>	Rev <Rev Code>
Date: Thursday, May 03, 2007	Sheet 3 of 3	

3.2.2. Display part



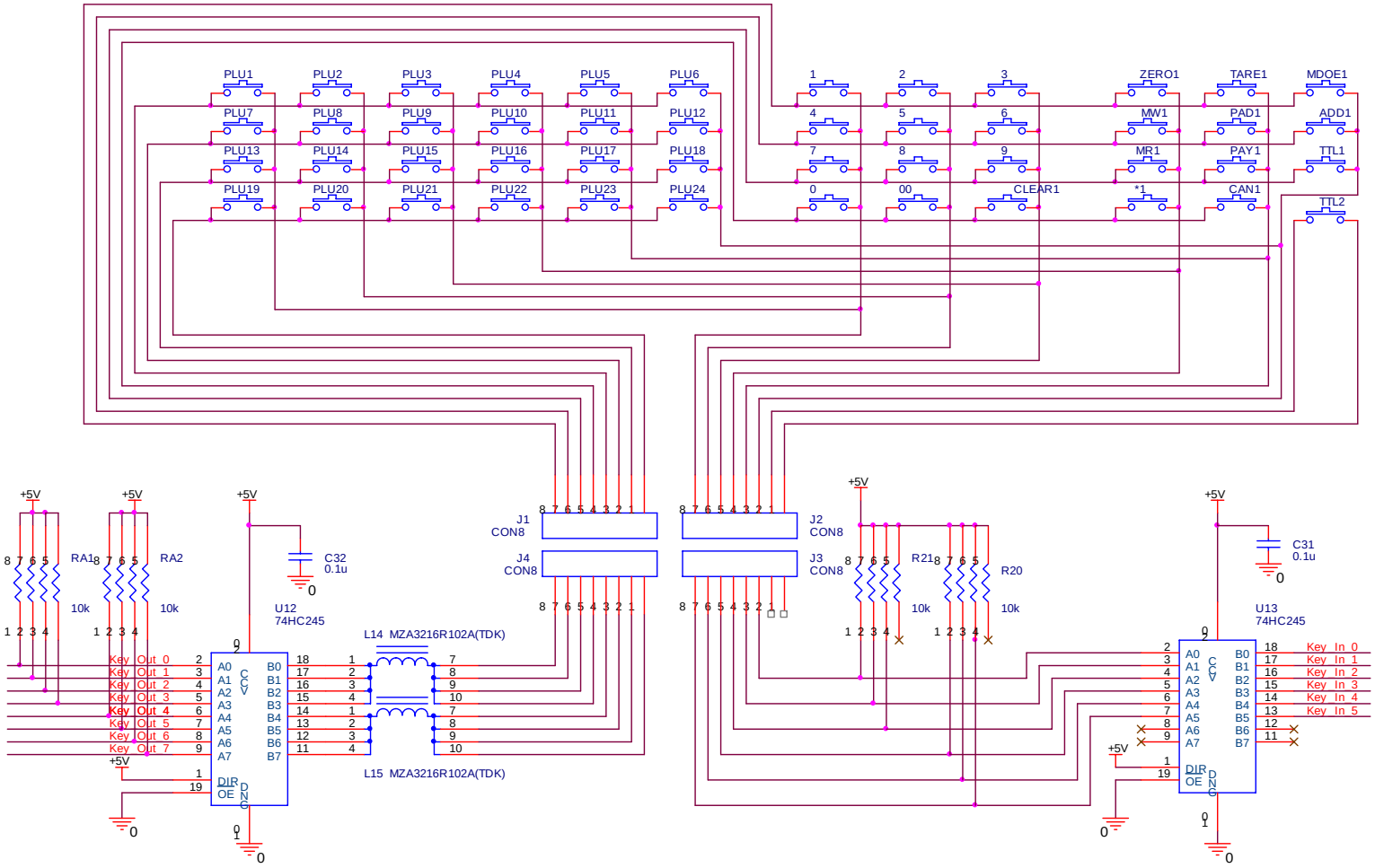






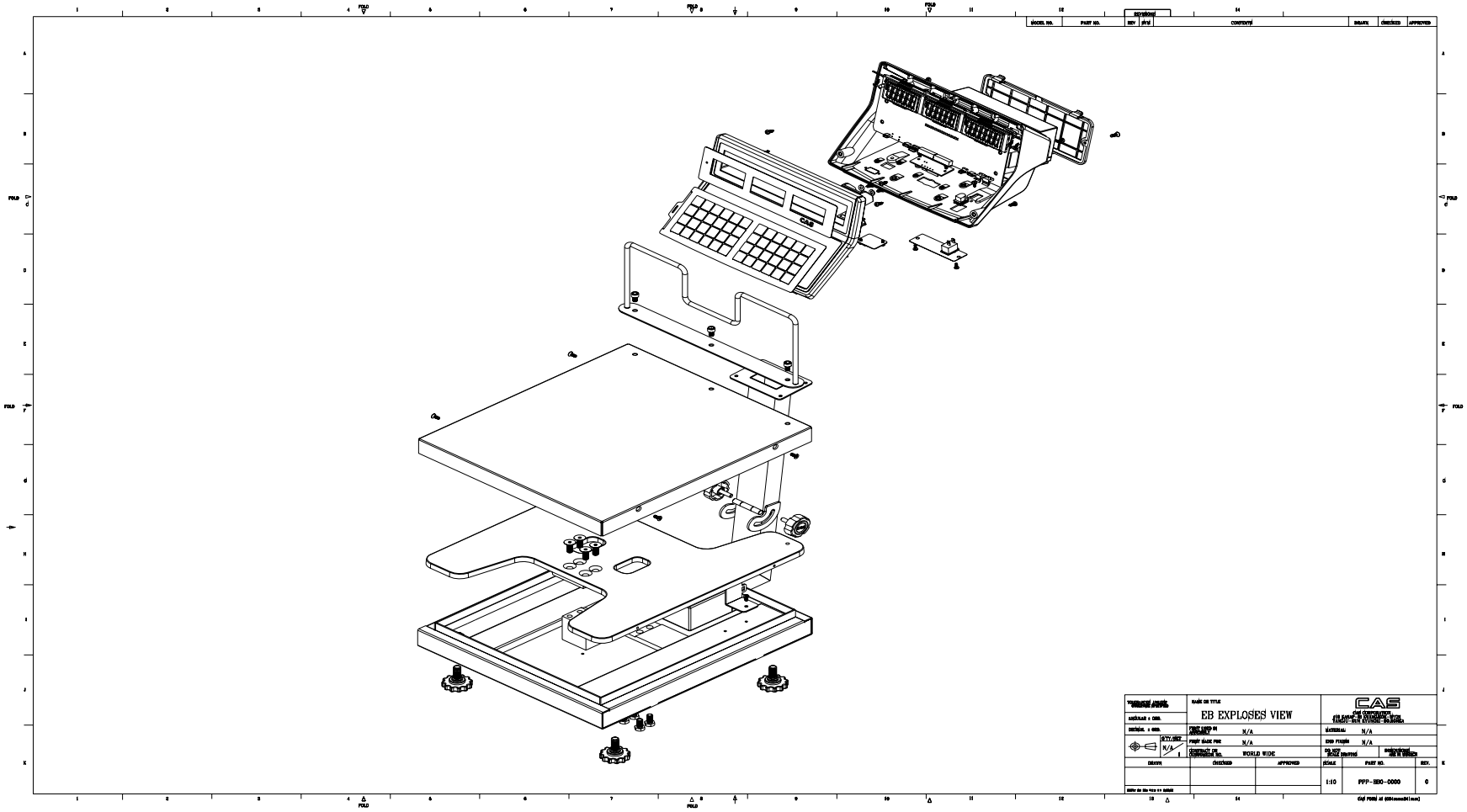
Title	EB - DISPLAY	
Size A4	Document Number <Doc>	Rev <RevCode>
Date: Thursday, May 03, 2007	Sheet 3 of 3	

3.2.3. Key Part

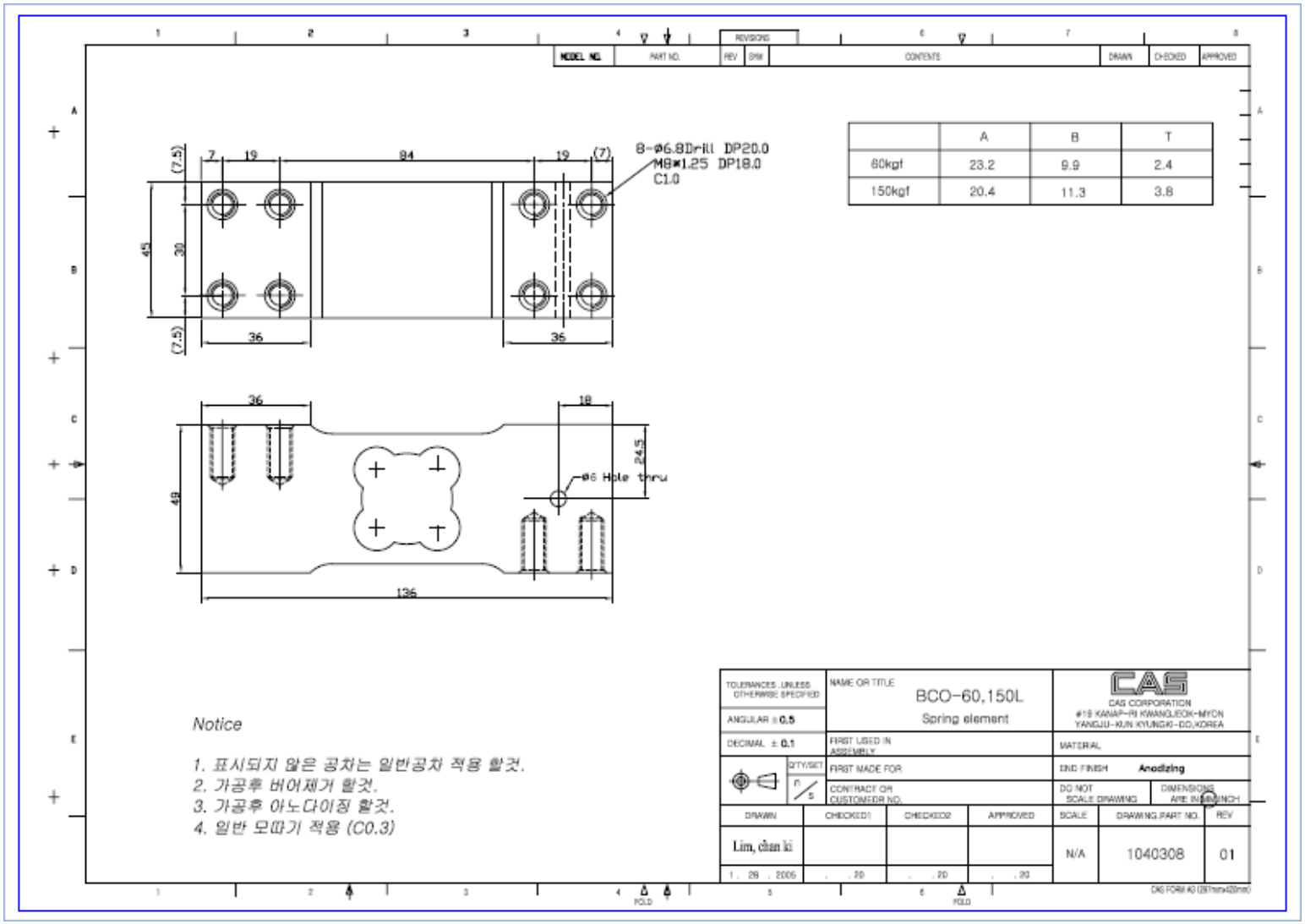


Title	EB - KEY		
Size A4	Document Number <Doc>		Rev <Rev Code>
Date: Thursday, May 03, 2007		Sheet 3 of 3	

4. Exploded View



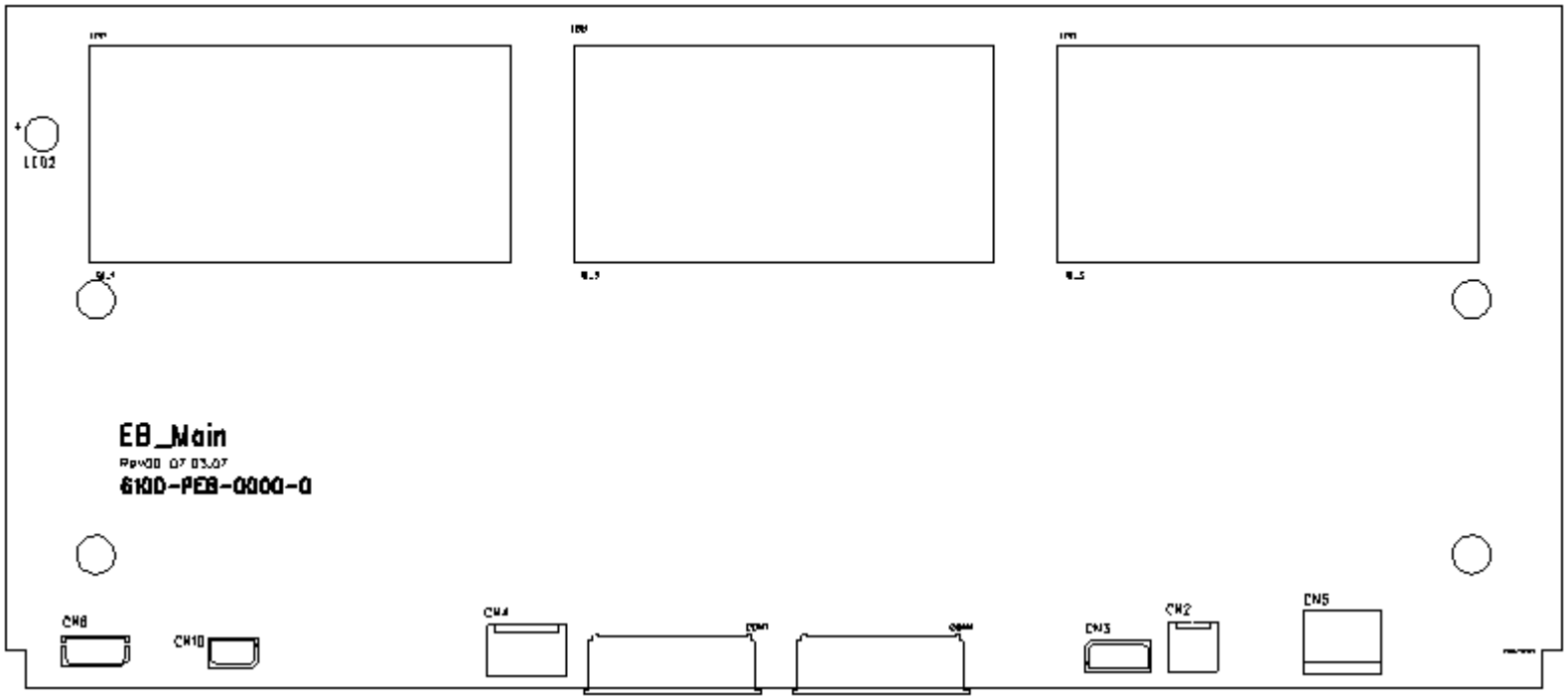
5. Load Cell drawing



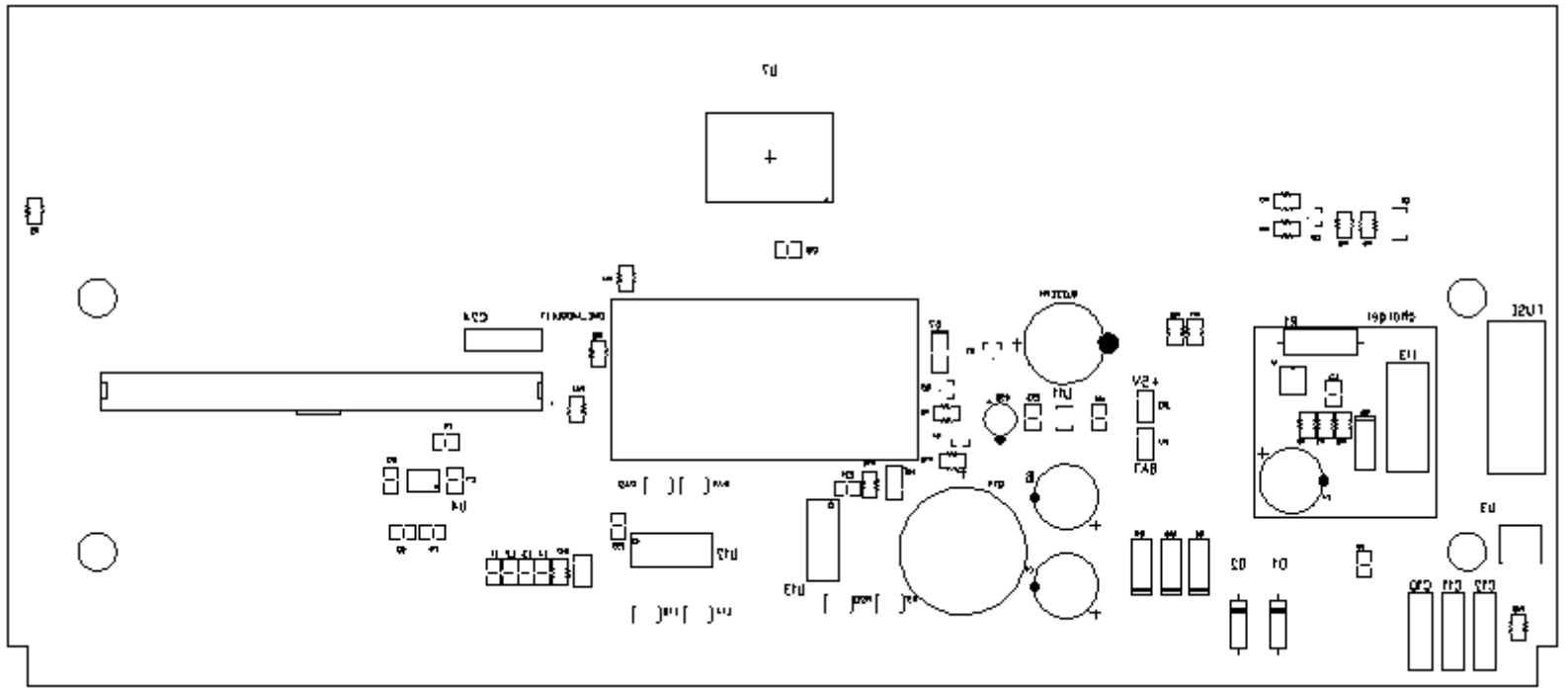
	A	B	T
60kgf	23.2	9.9	2.4
150kgf	20.4	11.3	3.8

6. Part Location

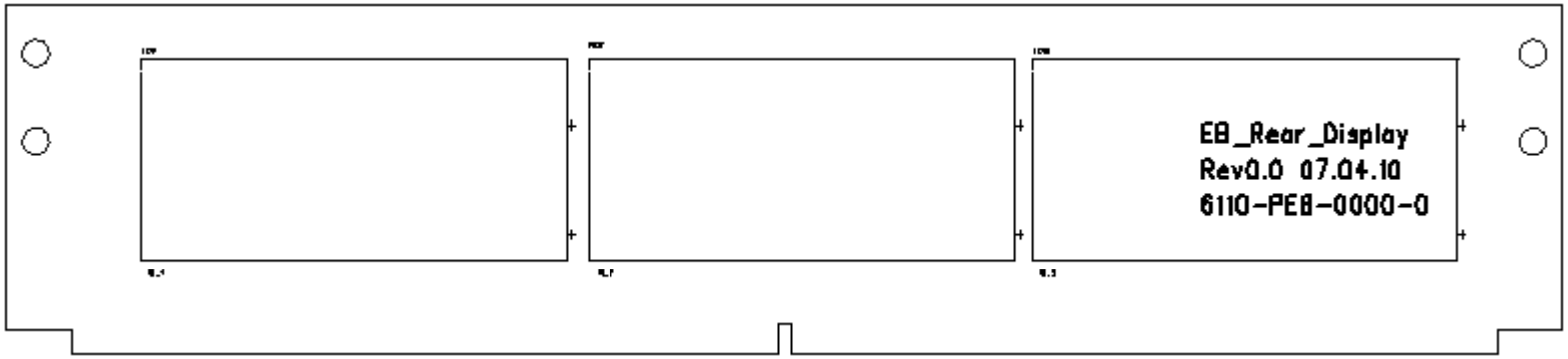
6.1. Main PCB (Top)



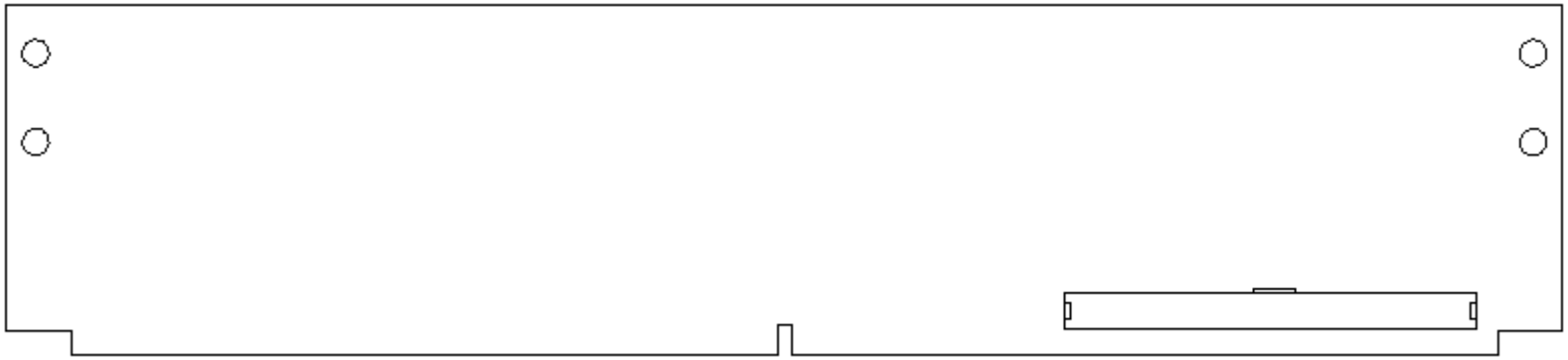
6.2. Main PCB (Bottom)



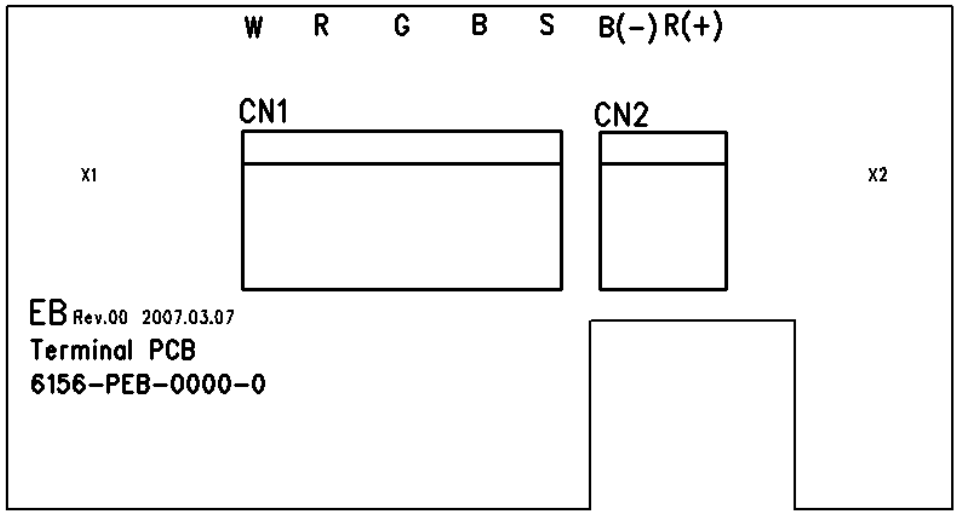
6.3. Rear Display PCB (Top)



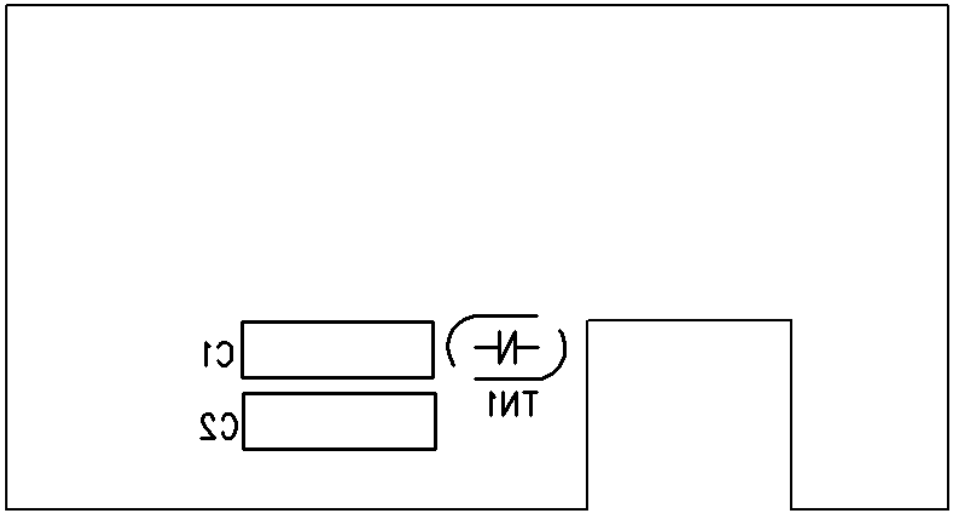
6.4. Rear Display PCB (Bottom)



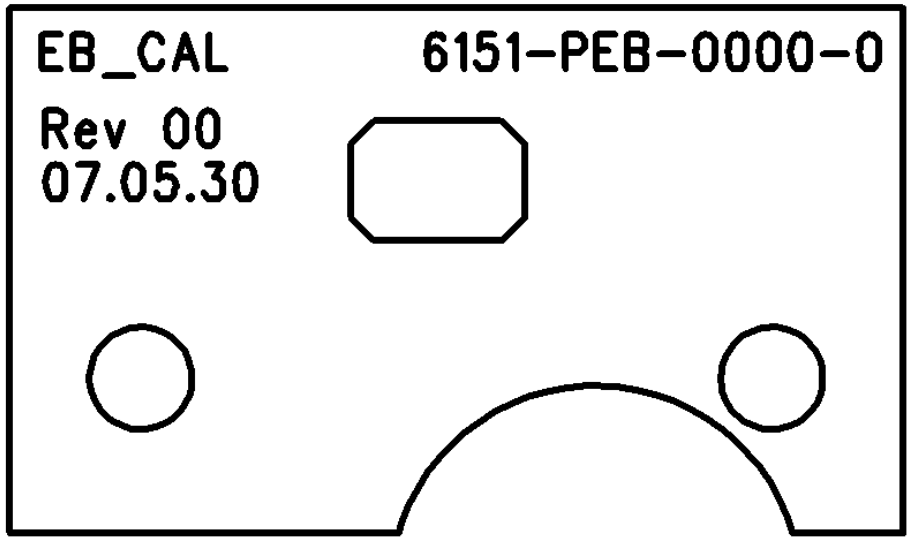
6.5. Terminal PCB (Top)



6.6. Terminal PCB (Bottom)



6.7. Cal PCB (Top)



7. Error Messages & Solution

Error Message on Display	Description	Solution
"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 10"	The "Err 10" means a failure of the analog module. Replace the analog module by a new one.	Please call your CAS dealer.
"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.	Please call your CAS dealer.
"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.	Please call your CAS dealer.
"Err 13"	The "Err 13" means the soft key code is broken.	Please call your CAS dealer.
“Help 1”	“Help 1” is marked in case of zero extent exceeded.	Please remove the item from the platter.
“Help 3”	“Help 3” is marked in case sale number of times exceeds 999 or add totalprice is over 9999.99	Spend again accumulated TTP value after delete
“Help 4”	- “Help 4” is marked in case Euro factor value is “0” at Euro rate application.	- Input again Euro factor value.
Err 4”	- “Help 4” Is marked when input smaller Pay cost than Total sale amount of money at Pay function use.	- Pay value than Total sale amount of money bigger value or same value input
“Help 5”	“Help 5” is marked when DTP number of times is more than 50000 times.	Spend again accumulated DTP value after delete

8. Part List

	CODE	NAME	SPEC	Q'TY
1	7002Z0000000	PIEZO BUZZER	APR,ADR(CHINA)	1
2	7802CLL00030	CONNECTOR(WAFER)	LWL0640-03 (LSW250-03)	1
3	7805CCN67030	CONNECTOR(WAFER)	03-5267	2
4	7801CLW00050	CONNECTOR(WAFER)	LW0640-05(GOLD) (LPH01-05A)	1
5	7805CCN67020	CONNECTOR(WAFER)	02-5267	1
6	7804CCN73030	CONNECTOR(WAFER)	5273-03 (LPH03-03)	1
7		CONDENSER-ELECTRIC	470uF/35V(short type)	3
8	6712CHP01040	CONDENSER-CHIP	CL21F 104KBNC	11
9	6712CHP04710	CONDENSER-CHIP	470pF	1
10	6710CAP0103B	CONDENSER-CERAMIC	0.01uF/3KV	4
11	6704C1601000	CONDENSER-ELECTRIC	100u/16v	1
12	6294ICP01840	DIODE-CHIP	KDS184	2
13	6294ISW4148A	DIODE-SWITCHING	PMLL4148L(LP-CONT')	1
14	6291IS058190	DIODE POWER	1N5819(SMD)	4
15	6291IPO54060	DIODE-POWER	1N5406	1
16		DIODE-ZENER		1
17	6670T0001020	INDUCTANCE	HB-1M2012-102JT(TP2,LP2,DBB)	4
18	6670T0102200	INDUCTANCE	220uH(NT SERIES)	1
19	6810F0001020	FERRITE BEAD SMD ARRAY	MZA3216R102A(TDK)	2
20	6281I0016660	TRANSISTOR CHIP	KTA1666	1

21	6281I0022220	TRANSISTOR CHIP	2N2222AS	1
22	6281I0015040	TRANSISTOR CHIP	KTA1504 SY	1
23	6527ID301000	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	3
24	6598IJ301000	RESISTOR-CHIP-ARRAY	RP164P103J(=1608 10kΩ X 4PCS)	
25		RESISTOR 2W	0.33 2W	1
26	6527ID300200	RESISTOR-CHIP 1/10W	RR1220P-202D(2 kΩ)	1
27	6527ID300220	RESISTOR-CHIP 1/10W	RR1220P-222D(2.2K)	1
28	6527ID300100	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	2
29	6527ID310000	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	6
30	6527ID300470	RESISTOR-CHIP 1/10W	RR1220P-472D(4.7 kΩ)	1
31	6527ID010000	RESISTOR-CHIP 1/10W	RR1220P-101D(100Ω)	1
32		RESISTOR-CHIP 1/10W	10Ω	1
33		IC(step up-down regulator)	MC34063A	1
34	6224I0016220	IC(LCD DRIVER)	HOLTEX HT1622 (ERS-LCD)	1
35		IC(REGULATOR)	LM7809,KA7809	1
36		IC(INTERFACE)	SP232ECY(SIPEX),MAX3232	1
37	6220IS0C5020	IC(REGULATOR)	XC6204C502MR(5.0V)	1
38	6236IS00245A	IC(C MOS)	74HC245D(LP-II)	2
39	7813C000050B	SOCKET CONNECTOR	5332-50P	1
40	6710CAP0103B	CONDENSER-CERAMIC	0.01uF/3KV	2
41	6271I0071800	SIDAC(VARISTOR)	INR7D180(MW-2)-5EA	1