

PD-II MANUAL

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1. Introductions

1.1. The 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.

Your departments can enjoy with this high quality reliable CAS product.

We believe that your needs will be satisfied and you will have proper reliability with in variable weight.

This manual will help you with proper operations and care of the PD-II series.

Please keep it handy for the future references.

1.2. Precautions

To ensure that you get the most from your scale, please follow these instructions.

1. Do not disassemble the scale. When any damage or defect occurs, contact your CAS authorized dealer immediately for proper repair.
2. Do not overload beyond the maximum weight limit.
3. Scale must be grounded to minimize electricity static. This will minimize defect or electric shock.
4. Do not pull the plug by its cord when unplugging. Damaged cord could cause electric shock or fire.
5. To prevent from fire occurring. Do not place or use the scale near flammable or corrosive gas.
6. To reduce electric shock or incorrect reading. Do not spill water on the scale or place it in humid condition.
7. Avoid placing the scale near heater or in direct sunlight.
8. Insert plug firmly to wall outlet to prevent electric shock.

Make sure to plug your scale into the proper power outlet. For maximum performance, plug into a power outlet 30 minutes before the usage for warm up.

9. For consistent and accurate reading, maintain periodical check by your CAS authorized dealer.
10. Avoid sudden shock to the scale. Internal mechanism could be damaged.
11. Grab on the bottom of the scale when moving. Do not hold by the platter.
12. Place the scale on firm and temperature consistent environment.
13. 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.
14. Keep the scale away from other electromagnetic generating devices. This may interfere with accurate reading.

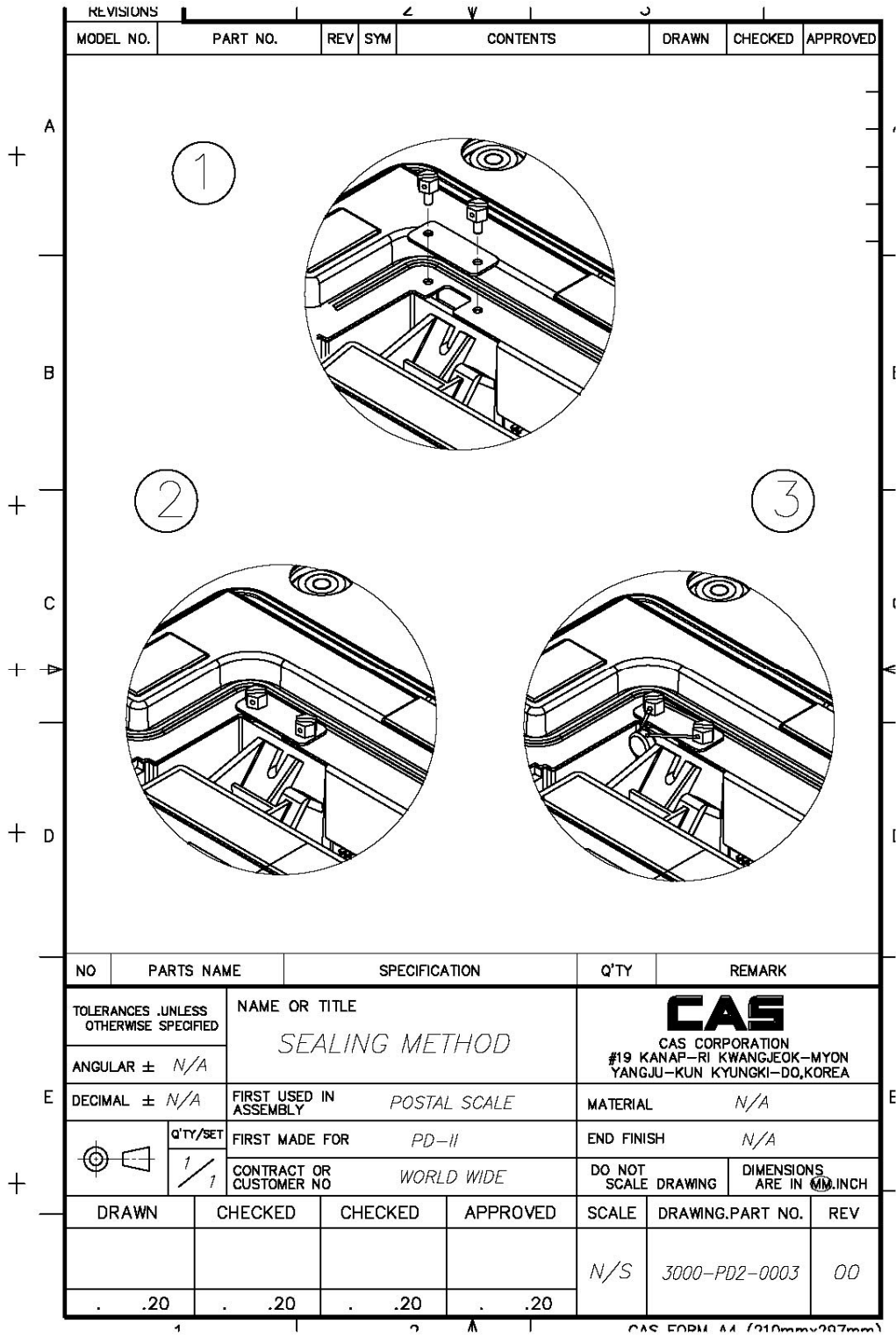
1.3. Specifications (CE)

MODEL	PDII – 6kg	PDII – 15kg	PDII – 30kg	PDII-60kg
CAPACITY	<u>Single Interval</u> 6 kg	<u>Single Interval</u> 15 kg	<u>Single Interval</u> 30 kg	<u>Single Interval</u> 60 kg
INTERNAL RESOLUTION	1 / 90,000	1 / 90,000	1 / 90,000	1 / 90,000
EXTERNAL RESOLUTION	1 / 3,000	1 / 3,000	1 / 3,000	1 / 3,000
TARE SUBTRACTION	-6kg	- 15kg	- 30kg	-60kg
DISPLAY	VFD 6 digit			
DISPLAY LAMP	ST, ZERO, NET, kg, lb			
INTERFACE	RS – 232C, 4-Bit Parallel Communication. (ECR Interface)			
PRODUCT SIZE	380× 280 × 79 [mm]			
PLATTER SIZE	380 × 280 [mm]			
OPERATING TEMPERATURE	- 10 °C ~ +40 °C			
POWER SOURCE	AC 230 V / 50 Hz			
OPTION	Remote Display, Customer Display			

Pound(lb) Version (UL)

MODEL	PD2 – 15LB	PD2 – 30LB	PD2 – 60LB	PD2-150LB
Capacity	<u>Single Interval</u> 15 lb / 0.005 lb	<u>Single Interval</u> 30 lb/ 0.01 lb	<u>Single Interval</u> 60 lb/ 0.02 lb	<u>Single Interval</u> 150 lb / 0.05 lb
	<u>Dual Interval</u> 6 lb / 0.002 lb	<u>Dual Interval</u> 15lb / 0.005 lb	<u>Dual Interval</u> 30 lb/ 0.01 lb	<u>Dual Interval</u> 60 lb / 0.02 lb
	15 lb / 0.005 lb	30 lb/ 0.01 lb	60 lb/ 0.02 lb	150 lb / 0.005 lb
INTERNAL RESOLUTION	1 / 90,000	1 / 90,000	1 / 90,000	1 / 90,000
EXTERNAL RESOLUTION	1 / 3,000	1 / 3,000	1 / 3,000	1 / 3,000
Display	VFD 6 digit			
DISPLAY LAMP	STABLE, ZERO.			
INTERFACE	RS – 232C, 4-Bit Parallel Communication.(ECR Interface)			
PRODUCT SIZE	380× 280 × 79 [mm]			
PLATTER SIZE	380× 280 [mm]			
OPERATING TEMPERATURE	- 10 °C ~ +40 °C			
OPTION	Remote Display, Option Display			
POWER SOURCE	AC 120 V / 60 Hz			

1.4. Sealing Method



2. Calibration Mode

To go to calibration mode, turn on the power while pressing the calibration switch.

The display shows "CAL" three times, and then "C-0".

Mode Selection : [#]key or [*] key

Enter : [ZERO] key

MODE	DESCRIPTION
C – 0	Normal Mode
C – 1	Span calibrated A/D value
C – 3	Span Calibration
C – 4	Capacity Display and Option Setting
C – 5	Averaging A/D Value
C – 6	Real A/D Value
C – 7	% Calibration (10%~100%)
C – 9	Gravity Constant

Calibration Mode

MODE	DESCRIPTION
C-4-1 Save Setting	Calibration Unit, Tare setting
C-4-2 Capacity Setting	Capacity setting
C-4-3 Comma Setting	Comma setting
C-4-4 Capacity Setting	Save setting

C – 4 Setting

2.1. How to Go to Normal Mode (C – 0)

To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.

To go to Normal mode, press the [ZERO] key.

2.2 How to Confirm Span Calibrated A/D Value(C – 1)

(1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.

(2) Press the [#] key until the display shows “C – 1” .

(3) Press the [ZERO] key, the display shows “0”.

(4) Place full capacity on the platter. The display shows “90,000”. If the number is not “90,000”, press the [*] or [#] key to have number up or down.

(5) Press the [ZERO] key, the display shows “C – 1”. You can change the mode by pressing [#] or [*] key.

2.3 Span Calibration(C – 3)

(1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.

(2) Press the [#] key until the display shows “C – 3”.

(3) Press the [ZERO] key, the display shows “UnLOAD”.

(4) Remove items from the platter and press the [ZERO] key. The display shows “StABLE” and then “LOAD”. (If you want to finish this mode, press the [#] key.

(5) Place full capacity on the platter and press the [ZERO] key. The display shows “C-3 End” and “C-3”.

(6) Remove full capacity from the platter. You can change the mode by pressing [#] or [*] key.

2.4 Capacity Display and Option Setting(C – 4)

For particulars please inquire at CAS .

Key operation :

- ◆ Press the ZERO key to enter setting value.
- ◆ Press the [#] key to change digit position.
- ◆ Press the [*] key to have number Up.

2.4.1 UNIT, TARE Setting(C-4-1)

B7	B6	B5	B4	B3	B2	B1	B0
Display Unit	Calibration Unit	NTEP			Initial Zero	TARE Release	TARE
0:kg 1:lb	0:kg 1:lb	0: Others			0:10%	0:TARE 1:TARE, ZERO	0:Successive Tare 1:One time Tare
Don't care		1: NTEP			1:2%	Don't care	Don't care

2.4.2 Capacity Setting(C-4-2)

B7	B6	B5	B4	B3	B2	B1	B0
CAPACITY					INTERVAL		
		Kg	lb		00 : Single 01 : Dual		
00011		6	15				
00111		15	30				
01001		30	60				
01100		60	150				

2.4.3 Comma Setting (C-4-3)

B7	B6	B5	B4	B3	B2	B1	B0
Comma Display							
1: Possible 0: Impossible							

2.4.4 Save Setting(C-4-4)

B7	B6	B5	B4	B3	B2	B1	B0
UNIT CHANGE							
1: Possible 0: Impossible							

→ If NTEP(C-4-1 3rd bit) is set, please do not care of “C-4-4” setting.

2.5 Averaging A/D Value(C - 5)

- (1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.
- (2) Press the [#] key until the display shows “C – 5”.
- (3) Press the [ZERO] key, the display shows averaging A/D.
- (4) Press the [ZERO] key to finish this mode.
- (5) You can change the mode by pressing [#] or [*] key.

2.6 Real A/D Value(C – 6)

- (1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.
- (2) Press the [#] key until the display shows “C – 6”.
- (3) Press the [ZERO] key, the display shows real A/D value.
- (4) Press the [ZERO] key to finish this mode.
- (5) You can change the mode by pressing [#] or [*] key.

2.7 % Calibration (C – 7)

- (1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.
- (2) Press the [#] key until the display shows “C – 7”.
- (3) Press the [ZERO] key, the display shows “Per 10”.
- (4) Press the [*] key to have number up or down The display shows 10, 20, 30, 40, 50, 60, 70, 80 and 90 every time pressing [*] key.

If you want to calibrate PDII-150lb with 30 lb, select 20.

- (5) Press the [ZERO] key, the display shows “UnLOAD”.
- (6) Remove items from the platter and press the [ZERO] key. The display shows “StAbLE” and then “LOAD”.
- (7) Place 20% weight of full capacity that you setup on step (3). And press the [ZERO] key, the display shows “StAbLE” and then “C-7End”.
- (6) Remove the weight from the platter. You can change the mode by pressing [#] or [*] key.



2.8 Gravity Constant (C – 9)

- (1) To go to calibration mode, turn on the power while pressing the calibration switch. The display shows “CAL” three times, and then “C-0”.
- (2) Press the [#] key until the display shows “C – 9”.
- (3) Press the [ZERO] key the display shows ”C91 “ and “ 9.7994”. Default value is 9.7994.
- (4) You can change gravity constant for calibration place. Press the [*] key to have number up or down. To move to next digit, press the [#] key.
- (5) To save it, press the [ZERO] key. The display shows “C92” and “ 9.7994”.
- (6) You can change gravity constant for using place. Press the [*] key to have number up or down. To move to next digit, press the [#] key.
- (7) Press the ZERO key, the display shows “C9–End” and “C – 9”.
- (8) You can change the mode by pressing [#] or [*] key.

2.9 ECR INTERFACE

2.9.1 ECR Interface

PD-II can interface with most ECRs by selecting TYPE 0 to TYPE 6.

2.9.2 ECR Type Selection

- (1) Make sure that power is OFF. While pressing [#] key, turn on the power. “EcrSEt” is shown on the display. And then current ECR type is shown on the display as “tYPE-2.
- (2) If you select ECR type 5, press the [#] key until the display shows it. (Refer to Table 1.)
- (3) To save current ECR type, press the ZERO key.

Table 1

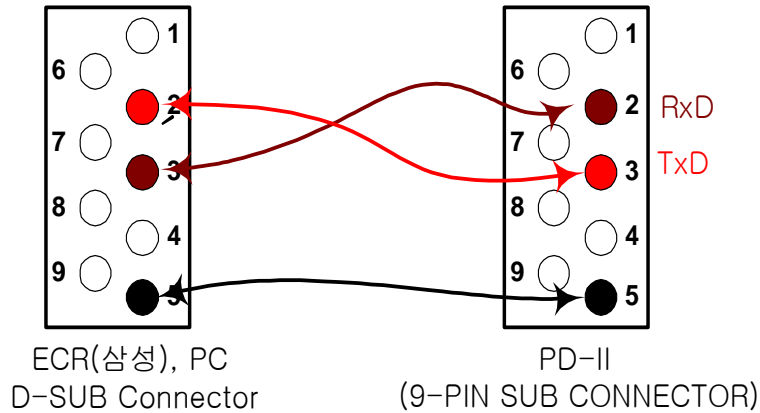
	MENU	Description	
		4-Bit Parallel	RS-232 Serial
	ECR-TYPE 0	TEC 4 Digit 4Bit Paralle (New kg)	Most P.O.S, ECRs and Some TEC P.O.S System
	ECR-TYPE 1	TEC 5 Digit 4Bit Paralle (Old kg)	
	ECR-TYPE 2	Universal 4 Bit Parallel	SHARP ER-Axxx, ER-A450T, New SANYO ECRs using RS-232 and others
	ECR-TYPE 3		Most P.O.S System
	ECR-TYPE 4		CRS, NCR2170, SAMAUNG ER-5100, ER5115 and Many other ECRs
	ECR-TYPE 5		NCI General. SAMSUNG ER-5100 Most P.O.S Software
	ECR-TYPE 6		SAMSUNG ER-670
	ECR-TYPE7		SAMSUNG ECR(SPAIN)
	ECR-TYPE8		SAMSUNG(PORTUGAL)

※ Serial Communication

→ 9600 Baud rate, 7 Data bit, Even Parity, 1 Stop bit

3 INTERFACE WITH EXTERNAL DEVICE

3.1 INTERFACE with RS-232C



- 7-BIT ASCII code
- Even parity
- 1 stop bit
- 9600 baud rate

3.1.1 TYPE-2 INTERFACE

: Discontinual RS-232C Interface

- SHARP ER-AXXX, ER-A450T, New SANYO ECRs using RS-232, TOLEDO 3213 etc.

1) PROTOCOL

ECR

SCALE(PD-II)

Command ----->

<W>

<----- Response

<STX> 0XXXX <CR> : lb weighing mode

or <STX> XXXXX <CR> : kg weighing mode

Error message : <STX>?<status byte><CR>

== STATUS BYTE ==

PARITY BIT	ALWAYS==1		ZERO		MINUS	OVERLOAD	MOTION
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

cf) W : 57H (ASCII code)
STX : 02H (ASCII code)
CR : 0DH (ASCII code)

Ex)

Weight : 12.34 lb

```

ECR                                SCALE
W<57H>  ----->
          <-----
          <02H><30H><31H><32H><33H><34H><0DH> : ASCII code
          STX  0   1   2   3   4   CR
    
```

3.1.2 TYPE-3 INTERFACE

: Continual RS-232C Interface

➔ SHARP ER-AXXX, New SANYO ECRs using RS-232, TOLEDO 3213 etc

1) PROTOCOL

ECR SCALE(PD-II)

Command ----->

<W>

<-----> Response

<STX> 0XXXX <CR> : lb weighing mode

<STX> XXXXX <CR> : kg weighing mode

Error message : <STX>?<status byte><CR>

<CR> -----> Stop transmitting data



Ex)

Weight : 12.34 lb

```

ECR                SCALE
W<57H>  ----->
          <-----<02H><30H><31H><32H><33H><34H><0DH> : ASCII code
                STX  0  1  2  3  4  CR
                <02H><30H><30H><30H><30H><30H><0DH> : ASCII code
                STX  0  0  0  0  0  CR
          <-----<02H><3FH><44H><0DH>
                STX  ?  MINUS  CR

```

TRANSMISSION PROCEDURE

- (1) PD-II sends data to External Device whenever weight is changed after receiving <W> signal from the External Device.
- (2) PD-II stops sending data when receives <CR> signal from the External Device.

External Device

```

<W>  ----->
          <----- DATA (If weight is changed)
          <----- DATA (If weight is changed)
<CR>  ----->          Stop transmitting data

```

3.1.3 TYPE-0 and TYPE-1 INTERFACE

➔ Most P.O.S Systems, ECRs and some TEC P.O.S Systems.

1) PROTOCOL

EXTERNAL DEVICE		SCALE(PD-II)
<ENQ>	----->	Initiate communication
<DC2>	----->	Request of weight data
	<-----	<ACK> : Acknowledge the request of weight data
.....		Inquiry

←----- <STX> : Start Transmission
 ←----- <ID> : Scale type identifier
 ←----- <W5> : Weight data
 ←----- <W4> : Weight data
 ←----- <W3> : Weight data
 ←----- <W2> : Weight data
 ←----- <W1> : Weight data
 ←----- <BCC> : Block Check Character
 ←----- <ETX> : End Transmission

i> Scale Type Identifier

41H = 15 kg	44H = 30 lb
43H = 6 kg	46H = 15 lb
NA = 3 kg	NA = 6 lb
42H = 25 kg	45H = 50 lb

ii> Block Check Character

: <BCC> has all data bytes except <STX> and <ETX> through exclusive OR(XOR).

* Parity Bit : Even

- Data Byte : <STX><ID><W5><W4><W3><W2><W1><BCC><ETX>

3.1.4 TYPE-4 INTERFACE

→ NCI ECR(NCR2170), SAMSUNG ER-5100,ER-5115, CRS .etc

1) PROTOCOL

<W> ----->

<CR> ----->

..... Inquiry

←----- <LF> XX.XXX LB <CR>

←----- <LF> S b1b2 <CR><ETX>

..... lb CASE

←----- <LF> XX.XXX KG <CR>

←----- <LF> S b1b2 <CR><ETX>

- (A) XX.XXX = Weight value
- (B) LB = The Characters L and B
- (C) KG = The Characters K and G
- (D) S = The Character S
- (E) b1b2 = Two status Characters

i> Status Bytes

Bit7	Parity Bit	Parity Bit
Bit6	0	0
Bit5	1 (Always 1)	1 (Always 1)
Bit4	1 (Always 1)	1 (Always 1)
Bit3	0	0
Bit2	0	0
Bit1	1 = Scale at Zero 0 = Not at Zero	1 = Over Capacity 0 = Not Over Capacity
Bit0	1 = Scale in Motion 0 = Stable	1 = Under Capacity 0 = Not Under Capacity

ii> Simplified Status Codes

B1	B2	STATUS Definition
ASCII Character (ASCII Code)	ASCII Character (ASCII Code)	
0 (30H)	0 (30H)	OK
1 (31H)	0 (30H)	Motion
2 (32H)	0 (30H)	Scale at Zero
0 (30H)	1 (31H)	Under capacity
0 (30H)	2 (32H)	Over capacity

3.1.5 TYPE-5 INTERFACE

→ NCI GENERAL , SAMSUNG ER-5115, ER-5100 and Most P.O.S Software

1) PROTOCOL

<W> ----->

<CR> ----->

..... Inquiry

←----- <LF> XX.XXX LB <CR>

←----- <LF> b1b2 <CR><ETX>

..... lb CASE

←----- <LF> XX.XXX KG <CR>

←----- <LF> S b1b2 <CR><ETX>

- (F) XX.XXX = Weight value
- (G) LB = The Characters L and B
- (H) KG = The Characters K and G
- (I) b1b2 = Two status Characters

i> Status Bytes

Bit7	Parity Bit	Parity Bit
Bit6	0	0
Bit5	1 (Always 1)	1 (Always 1)
Bit4	1 (Always 1)	1 (Always 1)
Bit3	0	0
Bit2	0	0
Bit1	1 = Scale at Zero 0 = Not at Zero	1 = Over Capacity 0 = Not Over Capacity
Bit0	1 = Scale in Motion 0 = Stable	1 = Under Capacity 0 = Not Under Capacity

ii> Simplified Status Codes

B1	B2	STATUS Definition
ASCII Character (ASCII Code)	ASCII Character (ASCII Code)	
0 (30H)	0 (30H)	OK
1 (31H)	0 (30H)	Motion
2 (32H)	0 (30H)	Scale at Zero
0 (30H)	1 (31H)	Under capacity
0 (30H)	2 (32H)	Over capacity

3.1.6 TYPE-6 INTERFACE

- 8 Data bit
- Noneparity
- 1 stop bit
- 9600 baud ate
- SAMSUNG ECR (ER-670)

1> PROTOCOL

EXTERNAL DEVICE

SCALE(PD-II)

<ENQ> -----→ Initiate communication
 ←----- <ACK> : Acknowledge the request of weight data
 <DC1> or <DC2> -----→ DC1 : For Weight Data
 DC2 : For All Data (**PD-II NOT USE**)
 ←----- Send Data Block

1> The Data Trains

1. "DC1"

SOH	STX	STA	SIGN	W5	W4	W3	W2	W1	W0	UN1	UN0	BCC	ETX	EOT
Command		DATA BLOCK										Command		

3.1.8 TYPE-8 INTERFACE

→ SAMSUNG (PORTUGAL)

1) PROTOCOL

<W> -----→

<CR> -----→

..... Inquiry

←----- <LF> XXX.XX KG <CR>

←----- <LF> S00 <CR><ETX>

..... Ib CASE

←----- <LF> XX.XXX KG <CR>

←----- <LF> S b1b2 <CR><ETX>

- i. XXX.XX = Weight value
- ii. KG = The Characters K and G
- iii. S = The Character S
- iv. 00 = <30H><30H>

3.2 INTERFACE with 4-BIT PARALLEL

3.2.1 TYPE-0 and1 INTERFACE

- TEC ECR (a) New : Type 0 (4 Digit)
- (b) Old : Type 1 (5 Digit)

(1) CONNECTOR : 25 PIN D-SUB CONNECTOR

(2) LOCATION : BOTTOM OF THE SCALE

(3) INTERFACE WITH ECR(TEC)

: PIN ASSIGNMENT

PIN NO.	DOCUMENT	
1	DATA1	(Output from PD-II to ECR)
2	DATA2	(Output from PD-II to ECR)
3	DATA3	(Output from PD-II to ECR)
4	DATA4	(Output from PD-II to ECR)
11	CLOCK	(Input from ECR to PD-II)

13	MOTION	(Output from PD-II to ECR)
19	ENABLE	(Input from ECR to PD-II)
20	SIGNAL READY	(Output from PD-II to ECR)
21	ENABLE	(Input from ECR to PD-II)
22	GND	
23	GND	
24	GND	

(4) DATA OUTPUT FORMAT

: INVERTED BCD DATA!!!

Example1) Weight : 12.34 lb & 87.56 lb lb Weight Mode

	1	2	3	4	8	7	5	6
DATA1	0	1	0	1	1	0	0	1
DATA2	1	0	0	1	1	0	1	0
DATA3	1	1	1	0	1	0	0	0
DATA4	1	1	1	1	0	1	1	1

Example2) Weight : 5.342 kg & 13.897 kg kg Weight Mode

	5	3	4	2	1	3	8	9	7
DATA1	0	0	1	1	0	0	1	0	0
DATA2	1	0	1	0	1	0	1	1	0
DATA3	0	1	0	1	1	1	1	1	0
DATA4	1	1	1	1	1	1	0	0	1

(5) SIGNAL DESCRIPTION

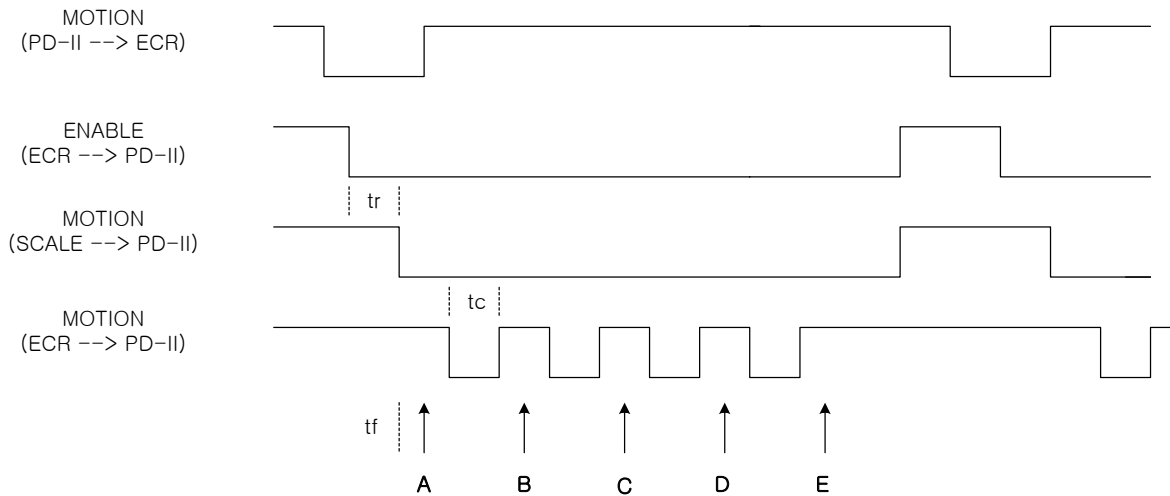
MOTION : LOW ---→ WEIGHT IS STABLE
HIGH ---→ WEIGHT IS UNSTABLE

SIGNAL READY : HIGHT ---→ DATA READY (The acknowledge signal for enabling)
: LOW ---→ DATA NOT READY

(6) PIN CONNECTION

ECR (TEC)		PD-II	
16 PIN CONNECTOR		25 PIN D-SUB CONNECTOR	
1	←-----→	1	
3	←-----→	2	
5	←-----→	3	
7	←-----→	4	
11	←-----→	11	
19	←-----→	13	
15	←-----→	19	
13	←-----→	20	
15	←-----→	21	(Jump with 19 pin)
2	←-----→	22	
4	←-----→	23	
6	←-----→	24	
8	←-----→	25	

(7) TIMMING DIAGRAM



note> t_r : When t_r is more than 3 sec, the ECR judges SCALE DOWN < 100 ns
 t_c : < 20 usec
 t_f : < 20 usec

8	←-----→	23
9	←-----→	24

(3.2) INTERFACE WITH ECR (CASIO)

(a) PIN ASSIGNMENT

PIN NO.	DOCUMENT
1	DATA1 (Output from PD-II to ECR)
2	DATA2 (Output from PD-II to ECR)
3	DATA3 (Output from PD-II to ECR)
4	DATA4 (Output from PD-II to ECR)
11	CLOCK (Input from ECR to PD-II)
13	MOTION (Output from PD-II to ECR)
19	ENABLE (Input from ECR to PD-II)
21	OUT OF RANGE (Output from PD-II to ECR)
22	GND
23	GND

(b) PIN CONNECTION

ECR (CASIO)

16 PIN D-SUB CONNECTOR

PD-II

25 PIN D-SUB CONNECTOR

11	←-----→	1
7	←-----→	2
8	←-----→	3
9	←-----→	4
12	←-----→	11
13	←-----→	13
10	←-----→	19
14	←-----→	21
15	←-----→	22
16	←-----→	23

(3.3) INTERFACE WITH ECR (SHARP)

(a) PIN ASSIGNMENT

PIN NO.	DOCUMENT	
1	DATA1	(Output from PD-II to ECR)
2	DATA2	(Output from PD-II to ECR)
3	DATA3	(Output from PD-II to ECR)
4	DATA4	(Output from PD-II to ECR)
11	CLOCK	(Input from ECR to PD-II)
13	MOTION	(Output from PD-II to ECR)
19	ENABLE	(Input form ECR to PD-II)
21	OUT OF RANGE	(Output from PD-II to ECR)
22	GND	
23	GND	
24	GND	

(b) PIN CONNECTION

ECR (SHARP)

16 PIN D-SUB CONNECTOR

PD-II

25 PIN D-SUB CONNECTOR

1	←-----→	1
3	←-----→	2
4	←-----→	3
5	←-----→	4
7	←-----→	11
15	←-----→	13
8	←-----→	19
9	←-----→	21
10	←-----→	22
11	←-----→	23
12	←-----→	24

(3.4) SIGNAL DESCRIPTION

① MOTION : LOW ---→ WEIGHT IS STABLE
HIGH ---→ WEIGHT IS UNSTABLE

② OUT OF RANGE

: HIGH ---→ HIGH LEVEL FOR WEIGHT BETWEEN ZERO AND FULL CAPACITY
 : LOW ---→ OTHERWISE

(2) DATA OUTPUT FORMAT

: BCD

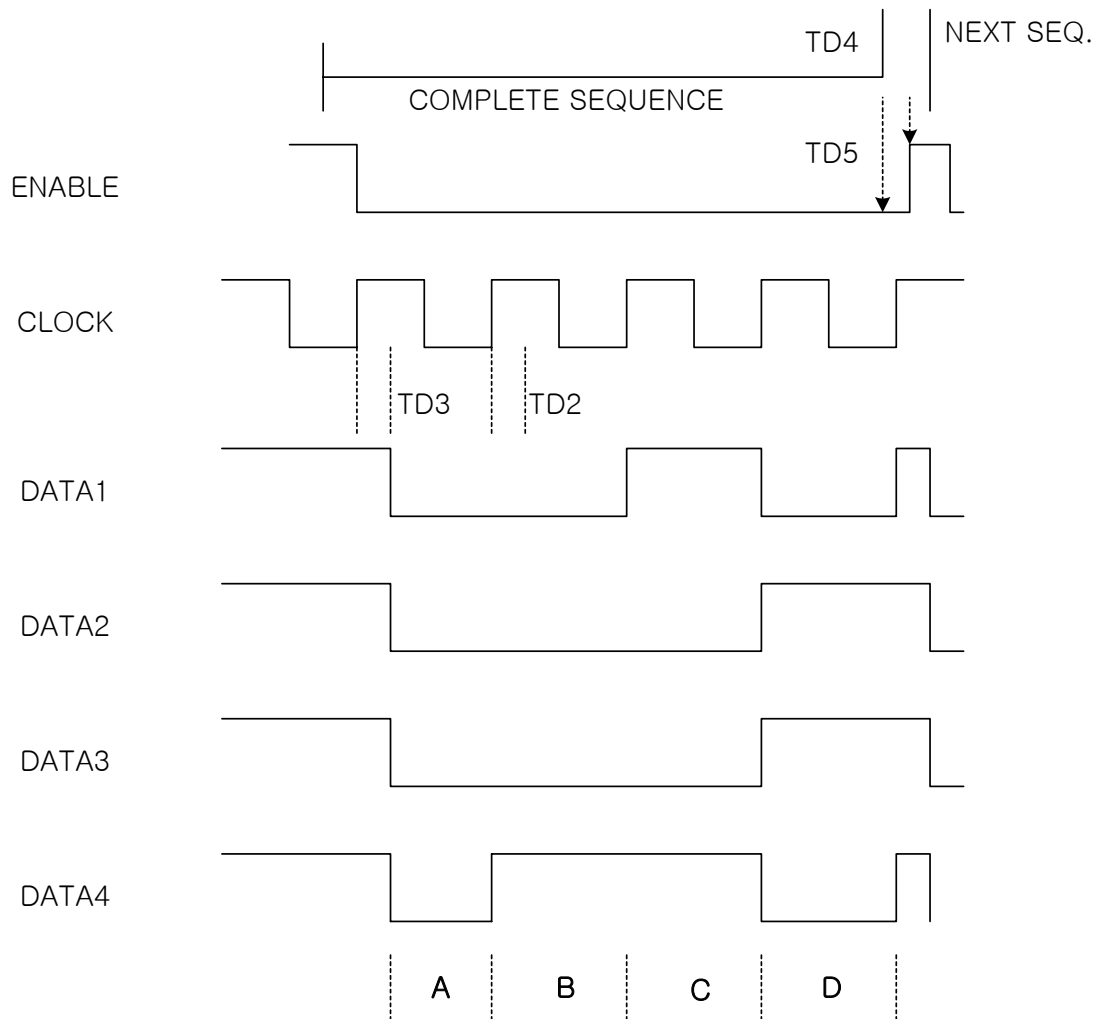
Example1) Weight : 12.34 lb & 87.56 lb lb Mode

	1	2	3	4	8	7	5	6
DATA1	1	0	1	0	0	1	1	0
DATA2	0	1	1	0	0	1	0	1
DATA3	0	0	0	1	0	1	1	1
DATA4	0	0	0	0	1	0	0	0

Example2) Weight : 5.342 kg & 11.897 kg kg Mode

	5	3	4	2	11(B)	8	9	7
DATA1	1	1	0	0	1	0	1	1
DATA2	0	1	0	1	1	0	0	1
DATA3	1	0	1	0	0	0	0	1
DATA4	0	0	0	0	1	1	1	0

(3) TIMMING DIAGRAM

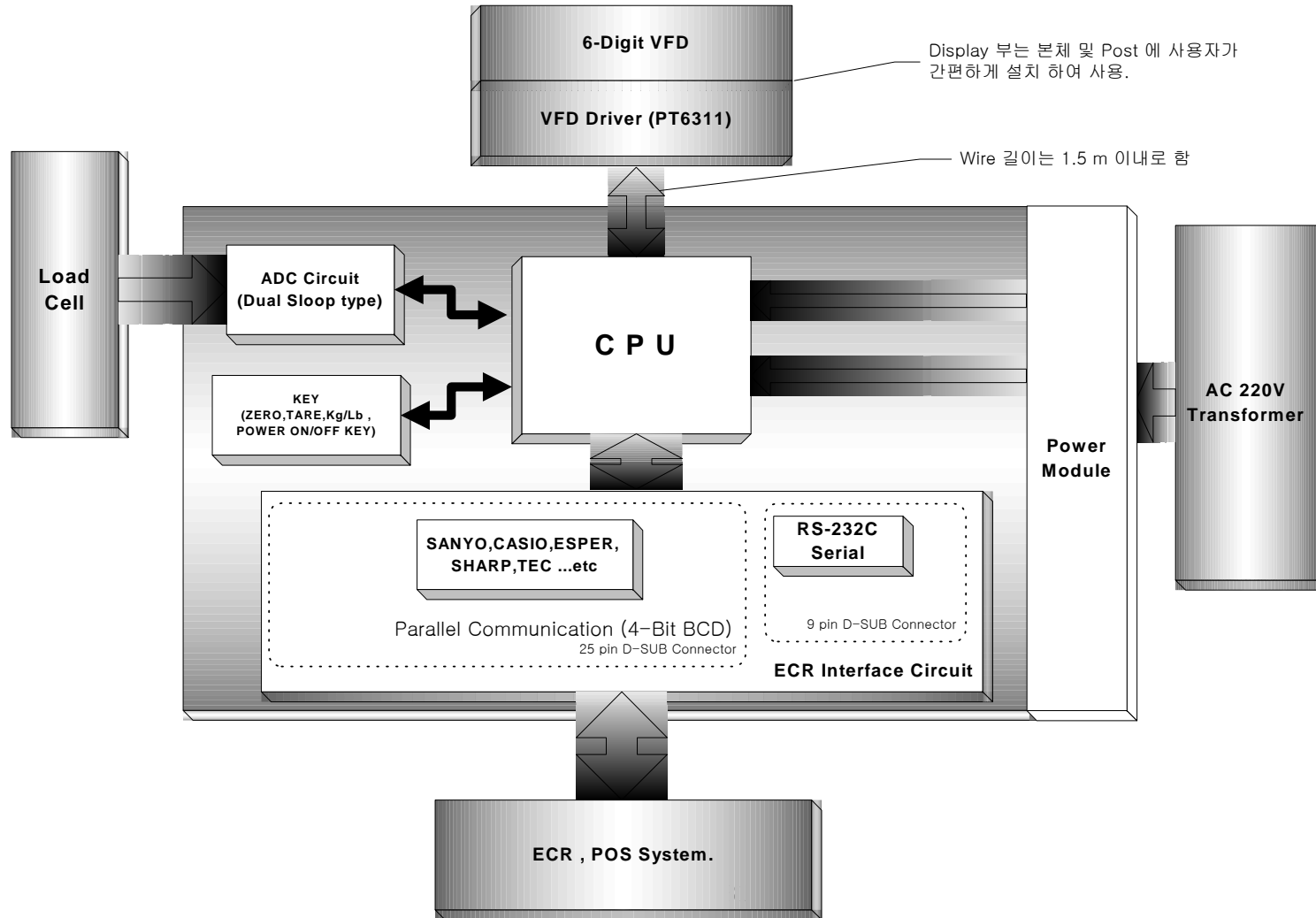


- A : UNIT X.000
- B : Tenth's place 0.X00
- C : Hundredth's place 0.0X0
- D : Thousandth's place 0.00X

Note> TD2 : < 100 ns --> data set up delay from rising edge of clock
 TD3 : 200 ns maximum --> data set up delay from Enable
 TD4 : 1 microsec. minimum --> time between interrogation
 TD5 : 200 ns minimum
 MAXIMUM CLOCK FREQUENCY : 100 KHZ

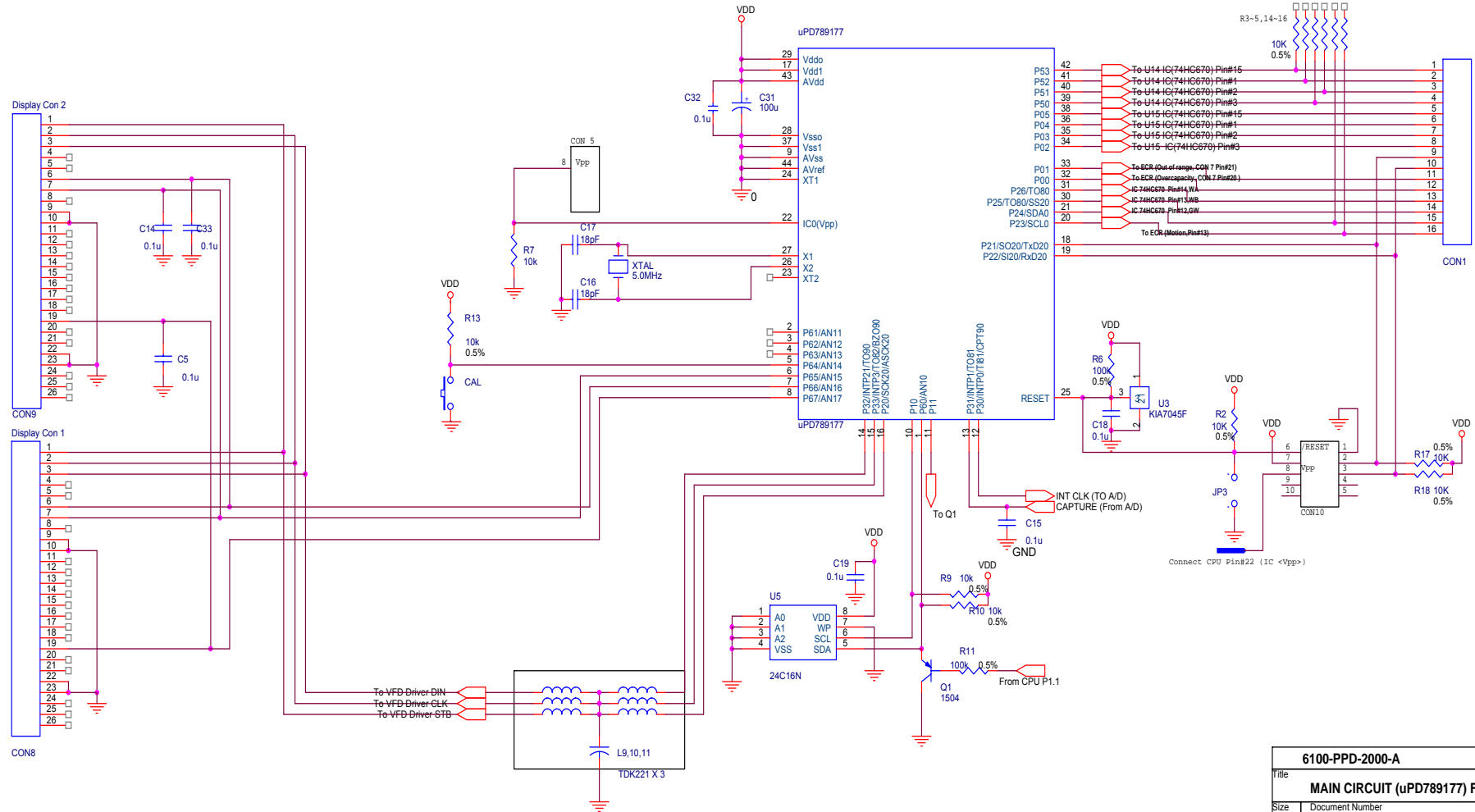
4 The Schematics and Diagram

4.1 System Block Diagram



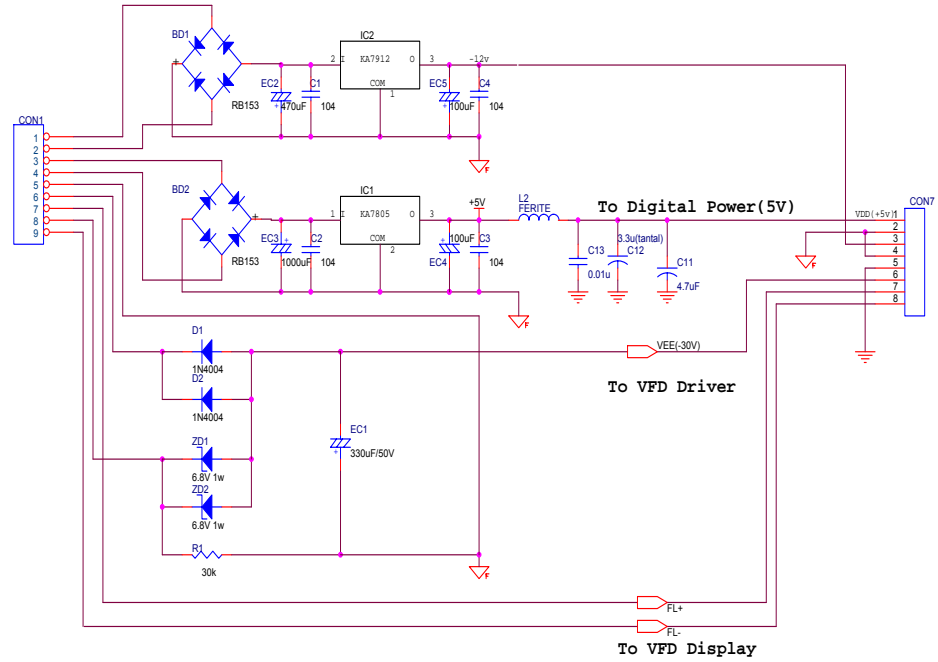
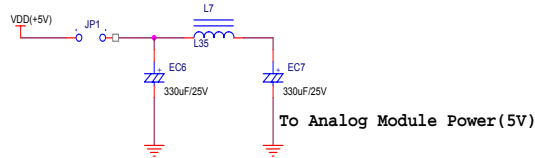
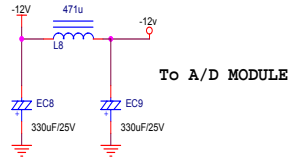
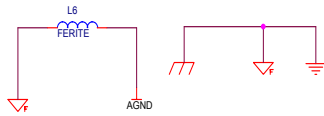
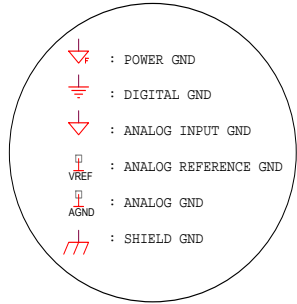
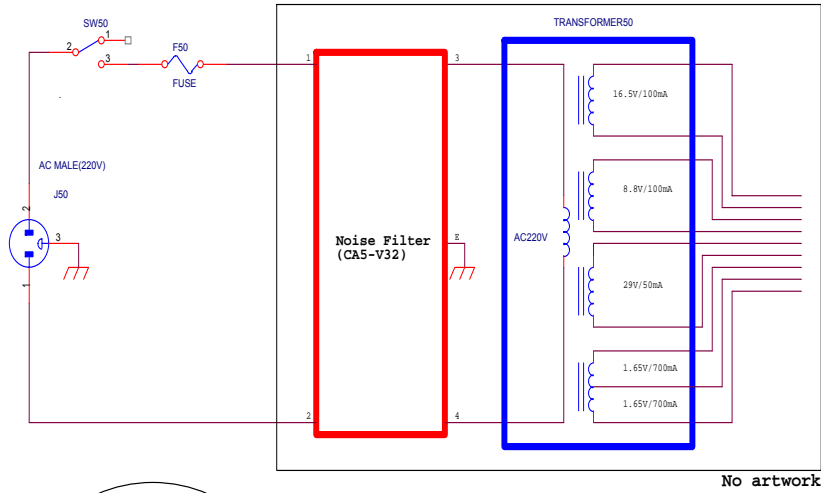
4.2 Circuit Diagram

4.2.1 Main



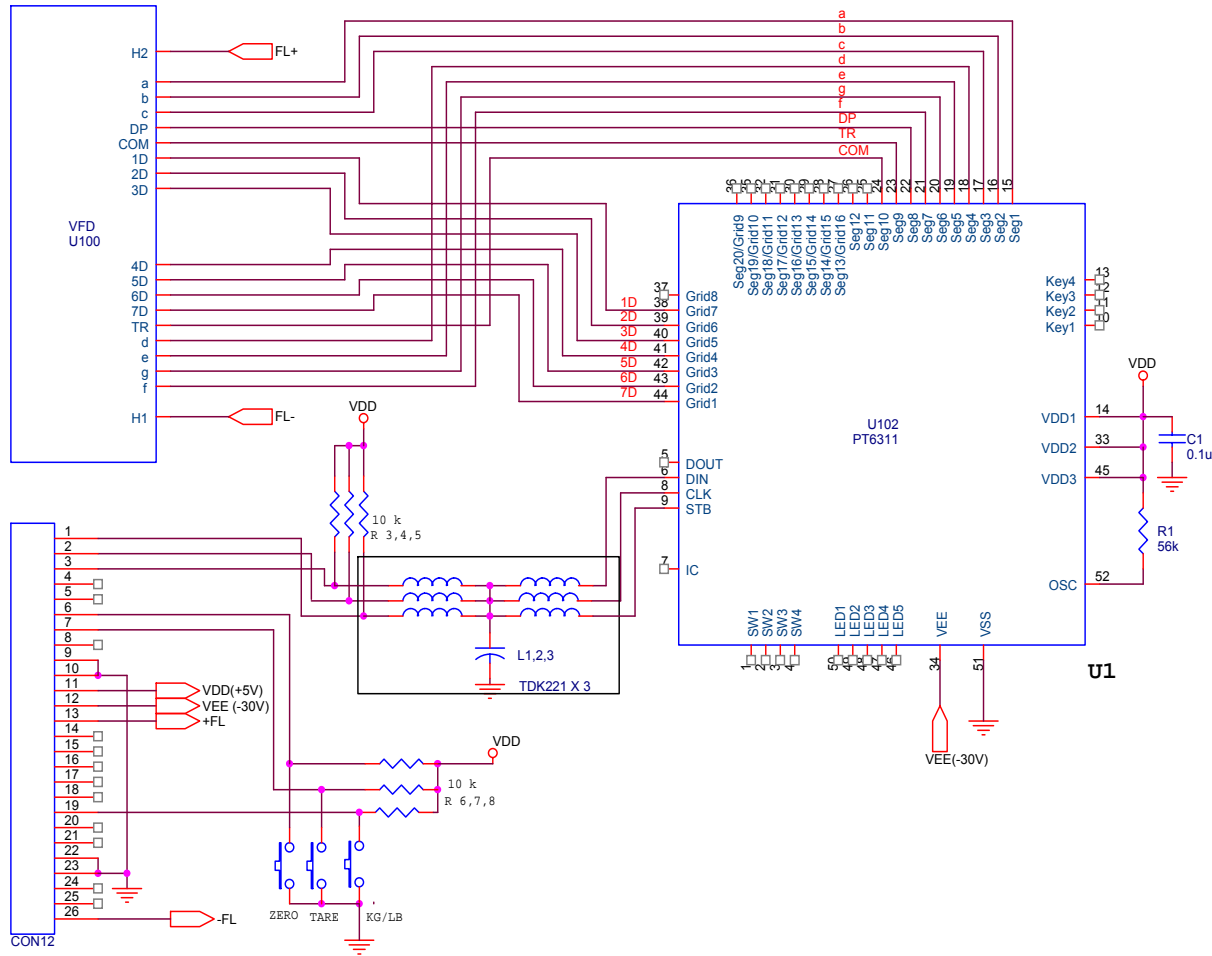
6100-PPD-2000-A		
File	MAIN CIRCUIT (uPD789177) For VFD	
Size	Document Number	Rev
Custom	First Drawing H.J	
Date:	Tuesday, August 12, 2003	Sheet 1 of 1

4.2.2 Power



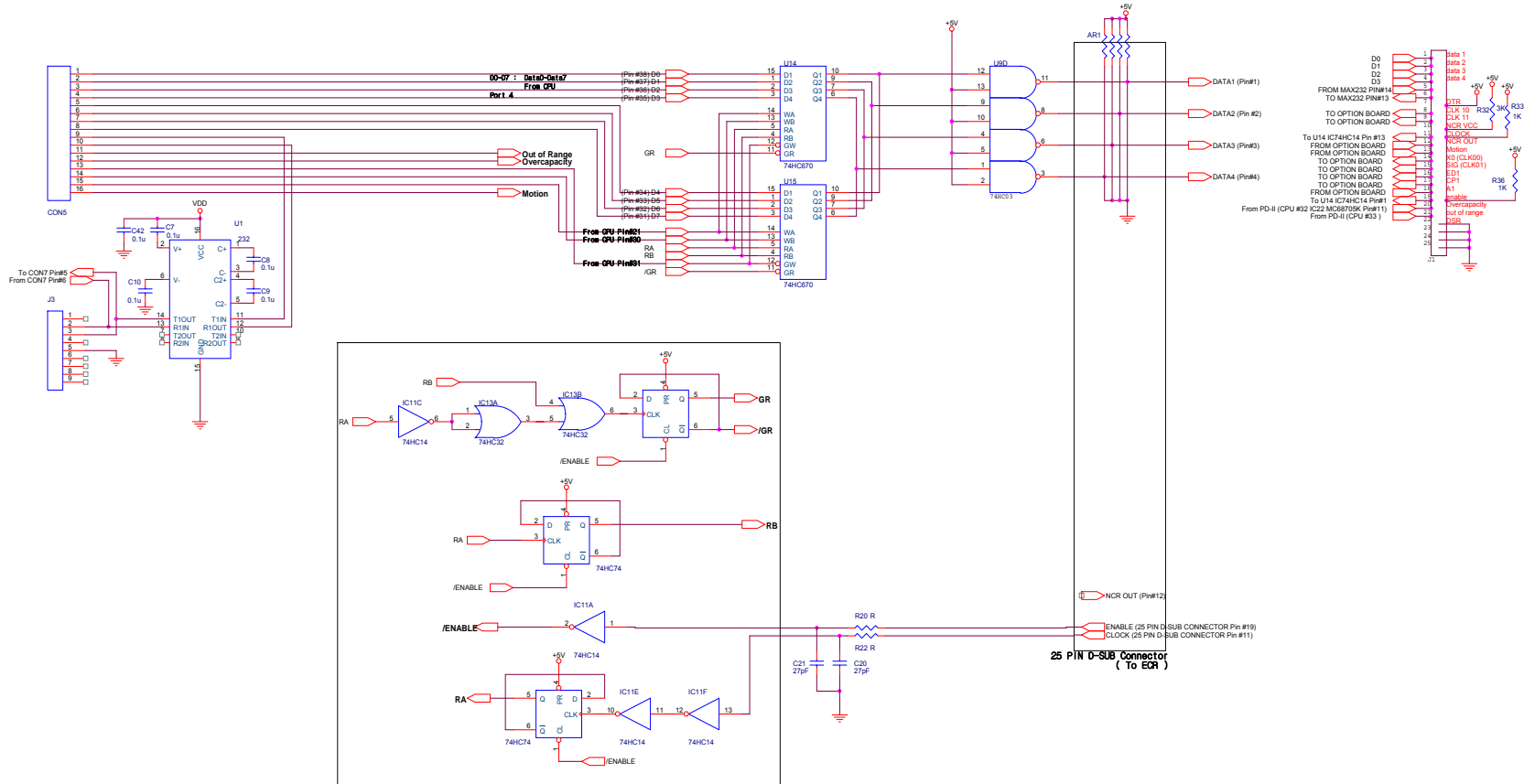
6140-PPD-2000-A		
Title Power Circuit for PD-II VFD Version		
Size Custom	Document Number <Doc>	Rev <Rev Code>
Date Tuesday, August 12, 2003	Sheet 1 of 1	

4.2.3 Display



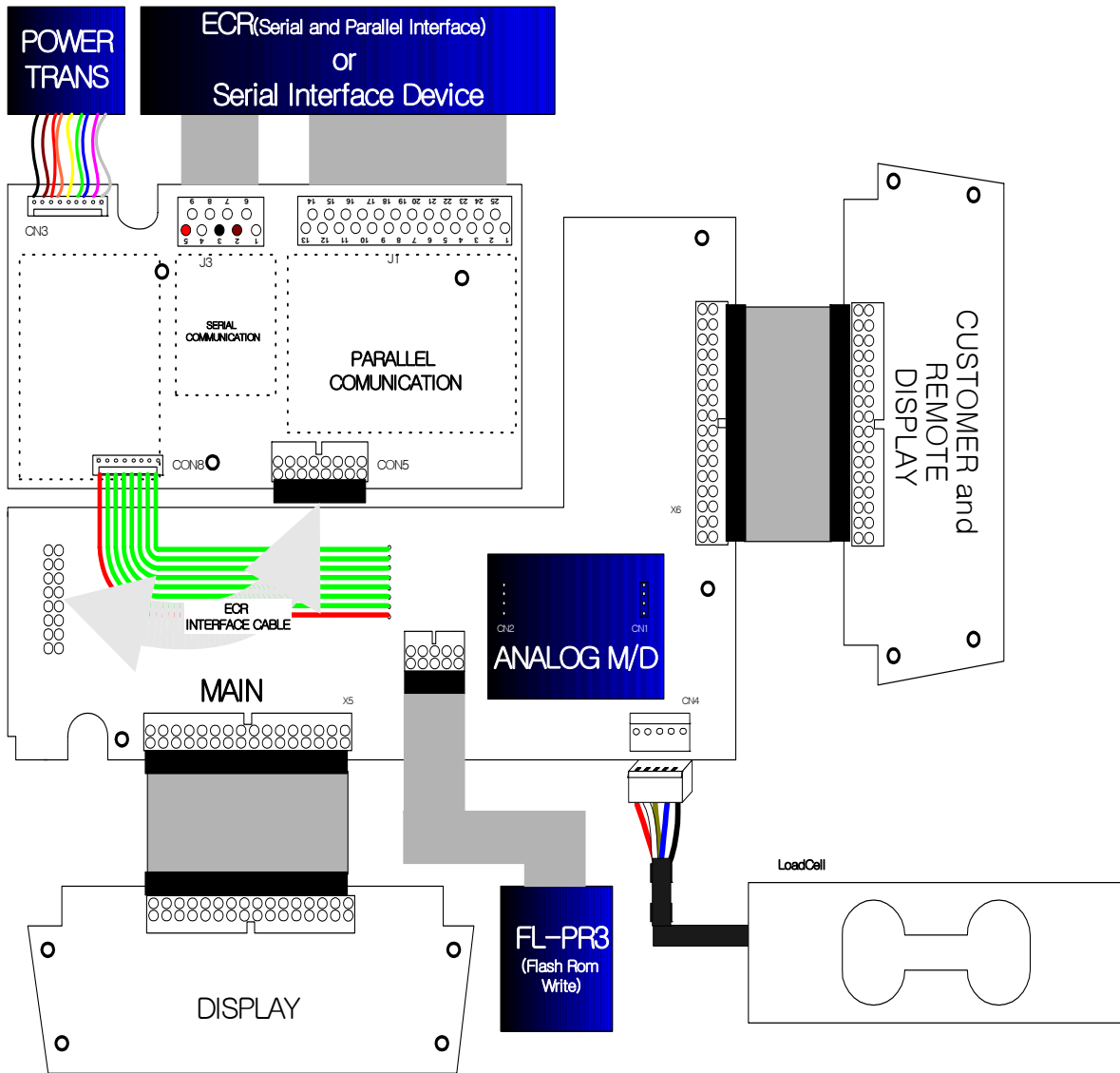
6110-PPD-2000-A		
Title		
PD-II DISPLAY PART (MAIN)		
Size	Document Number	Rev
Custom	Designed by H.J Chang	<Rev Code>
Date:	Tuesday, August 12, 2003	Sheet 1 of 1

4.2.4 Communication (Serial and Parallel)



6140-PPD-2000-A			
File	ECR Interface Circuit (POWER PCB)		
Size	Document Number	<Doc>	Rev
Custom			RevCode
Date	Tuesday, August 12, 2003	Sheet	1 of 1

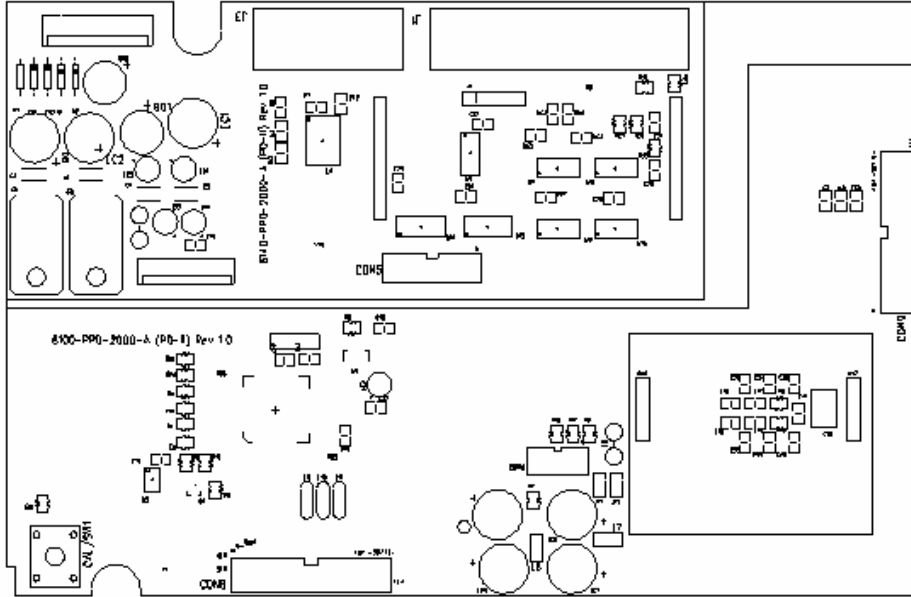
4.3 Wiring Diagram



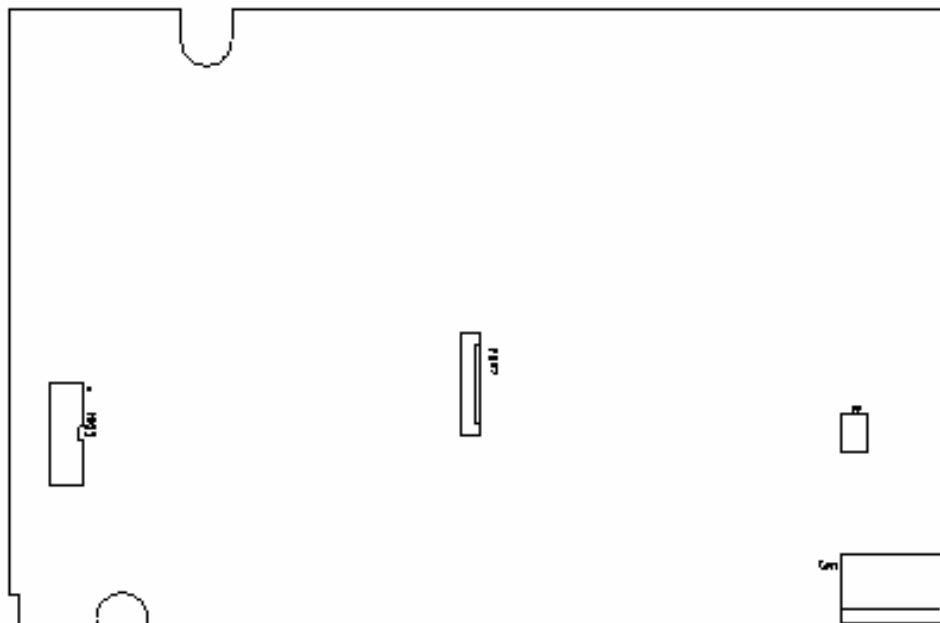
4.4 Parts Location

4.4.1 Main and Power Part

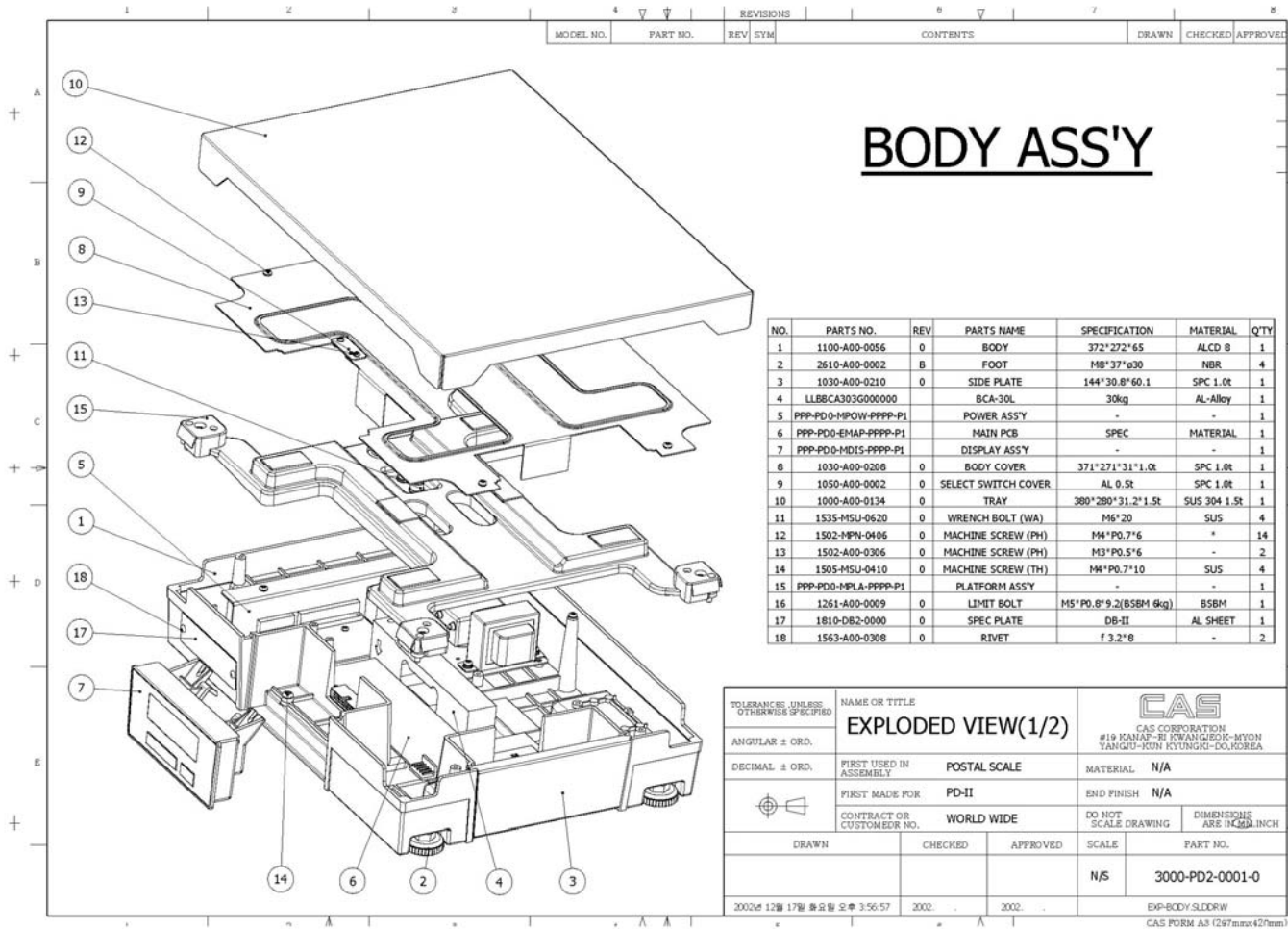
4.4.1.1 TOP

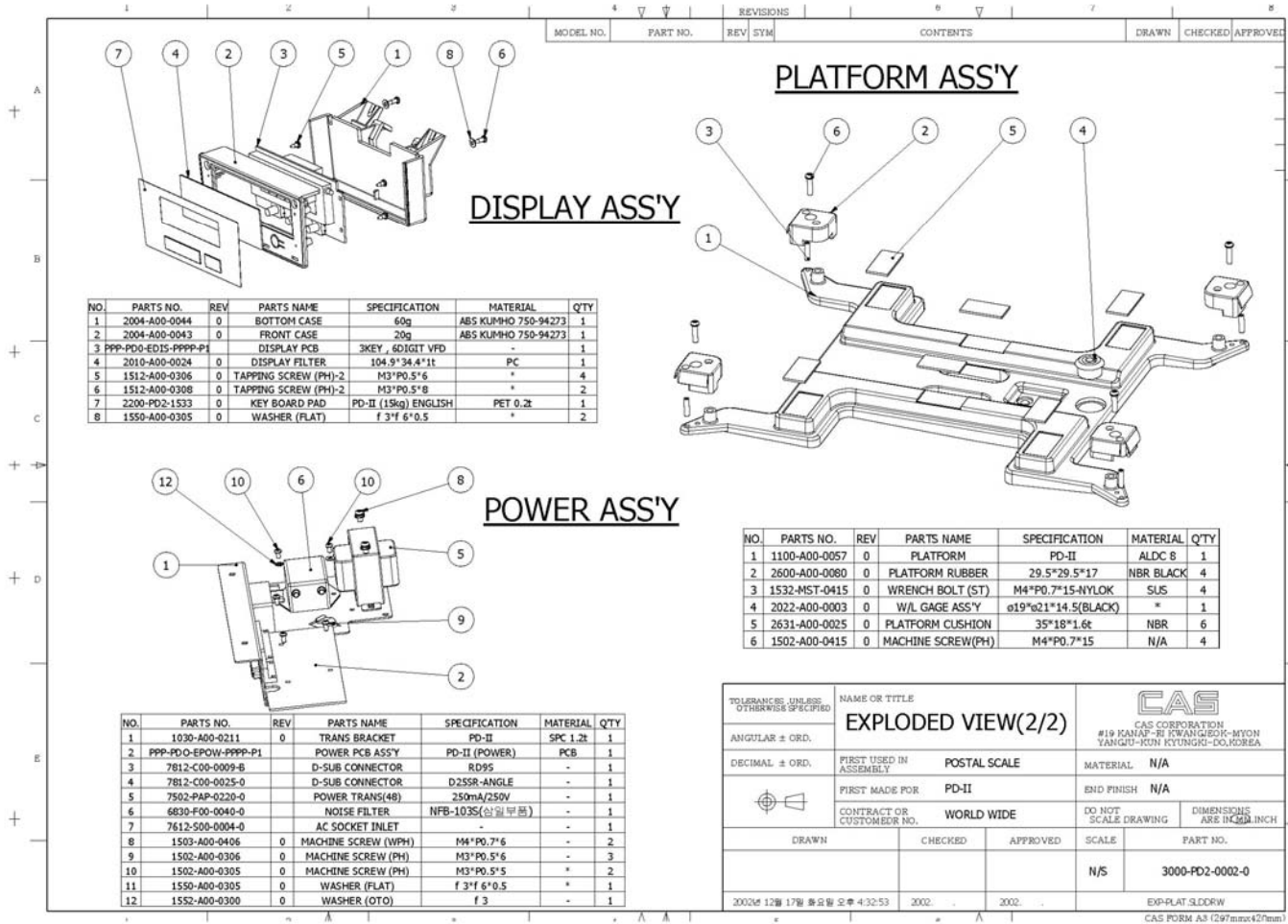


4.4.1.2 Bottom



5 EXPLODED VIEW







6 PARTS LIST

PD-II Parts List

PARTS NAME : PD-II [PPP-PD0-153G-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
140-AD3-EAMP-PA01-02	ANALOG MODULE ASS'Y	AD-20H		1	
140-PD2-EDIP-UN01-02	DISPLAY PCB ASS'Y	PD-II	EA	1	
140-PD2-EMAP-UN01-02	MAIN PCB ASS'Y	PD-II	EA	1	
140-PD2-EPWP-UN01-02	POWER PCB ASS'Y	PD-II	EA	1	
140-PD2-MBOD-UN01-02	BODY ASS'Y	PD-II	EA	1	
140-PD2-MCTB-UN01-02	C/T BOX ASS'Y	PD-II	EA	1	
140-PD2-MD1C-UN01-02	DISPLAY ASS'Y	PD-II	EA	1	
140-PD2-MPLA-UN01-02	PLATFORM ASS'Y	PD-II	EA	1	
140-PD2-MPWP-UN01-02	POWER ASS'Y	PD-II	EA	1	



PARTS NAME : DISPLAY ASS'Y [PPP-PD0-EDIS-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
2631-A00-0008-0	VFD CUSHION	43*8*1T(DB-1S)	EA	2	43*8*1T (DB-1S)
6110-PPD-2000-A	PCB-DISPLAY	6110-PPD-2000-0 (PD-II)	EA	1	6110-PPD-2000-0(PD-II)
6224-IS0-6311-0	IC(FIP-DRIVER)	PT6311 QFP	EA	1	U1
6527-ID3-0100-0	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	EA	7	R2,3,4,5,6,7,8
6527-ID3-0560-0	RESISTOR-CHIP 1/10W	RR1220P-563D(56K)	EA	1	RR1220P-563D(56K)
6712-CHP-0104-0	CHIP CONDENSER	CL21F 104 KBNC	EA	1	CL21F 104 KBNC
7202-D00-052B-0	VFD(FIP)	F-52B (7 DIGIT)	EA	1	V.F.D
7600-STA-1212-0	TACT S/W	12*12(SKHK)DJTA-1103E	EA	3	12*12 TACT S/W
7813-C00-0026-0	SOCKET CONNECTOR	5332-26P LP- II	EA	1	HIF-3F-26PA-2.54-DSA

PARTS NAME : MAIN PCB ASS'Y [PPP-PD0-EMAP-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
6100-PPD-2000-A	PCB-MAIN	6100-PPD-2000-0 (PD-II)	EA	1	6100-PPD-2000-2 (PD-II)
6200-IPU-9177-0	CPU	uPD78F9177	EA	1	CPU
6205-IS0-2416-0	IC(EEP-ROM)	AT24C164-10SC	EA	1	U5
6210-IS0-7045-0	IC(RESET)	KIA7045F	EA	1	U3
6281-I00-1504-0	CHIP TRANSISTOR	KTA1504 SY	EA	1	Q1



6527-ID0-0510-0	CHIP RESISTOR 1/10W	RR1220P-510D(51Ω)	EA	4	R8,12,L17,19
6527-ID3-0100-0	RESISTOR-CHIP 1/10W	RR1220P-103D(10K)	EA	9	R13,14,15,16,3,4,5,9,10
6527-ID3-1000-0	RESISTOR-CHIP 1/10W	RR1220P-104D(100K)	EA	1	R6,R11
6670-T00-0470-0	INDUCTANCE	470μH	EA	2	L7,8
6704-C25-0330-0	ELECTRIC-CONDENSER	330UF/25V	EA	4	EC6,7,8,9
6712-CAP-0180-0	CHIP CAPACITOR	18PF/50V(CL21C180J)	EA	2	C16,17
6712-CHP-0104-0	CHIP CONDENSER	CL21F 104 KBNC	EA	7	C5,14,19,18,32,33,?
6712-CHP-0471-0	CHIP CONDENSER	CL21F 471 KBNC	EA	6	C35,36,37,38,39,40
6712-CHP-0472-0	CHIP CONDENSER	CL21F 472 KBNC	EA	1	C41
6720-CAP-0474-A	POLYESTER-CONDENSER	0.47UF/63V-J(BOX)	EA	1	C34
6800-F00-0101-0	FERRITE BEADS SMD	MMZ 2012 S102A	EA	2	L16,18
6800-F00-0220-0	EMI FILTER	EFST221YTB(220PF)	EA	5	L4,9,10,11,15
6800-F00-3565-A	EMI BEAD FILTER	BFD-3565 R2	EA	1	L6
7010-ZM0-0500-0	CRYSTAL	5.000MHz	EA	1	
7600-STA-1212-0	TACT S/W	12*12(SKHK)DJTA-1103E	EA	1	12*12 TACT S/W
7808-CLA-0005-A	CONNECTOR(WAFER)	LA1143-05(GOLD)	EA	1	
7810-C00-9294-0	CONNECTOR	929400-40(MALE)	EA	0.35	14/40
7813-C00-0026-B	SOCKET CONNECTOR	HIF-3F-26PA-2.54-DS	EA	2	
7830-W00-0008-0	FLAT CABLE (PD-II POWER)	8(PIN)*190mm	EA	1	POWER WIRE
7830-W00-0016-0	FLAT CABLE (PD-II 병렬)	16(PIN)*80mm	EA	1	병렬통신 WIRE
7830-W00-0026-0	FLAT CABLE (PD-II DISPLAY)	26(PIN)*100mm	EA	1	DISPLAY WIRE



PARTS NAME : POWER PCB ASS'Y [PPP-PD0-EPOW-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
6140-PPD-2000-A	PCB-POWER	6140-PPD-2000-0 (PD-II)	EA	1	6140-PPD-2000-0 (PD-II)
6220-I00-7805-0	IC(REGULATOR)	TA7805S	EA	1	IC2
6220-I00-7912-0	IC(REGULATOR)	LM7912CT	EA	1	IC1
6236-IS0-0014-0	IC(C-MOS)	74HC14	EA	1	U11
6236-IS0-0032-0	IC(C-MOS)	74HC32D	EA	1	U13
6236-IS0-0074-0	IC(CMOS)	74HC74	EA	2	U10,12
6236-IS0-0670-0	IC(C-MOS)	74HC670	EA	2	U14,15
6236-IS0-7403-0	IC(C-MOS)	74HC03D	EA	1	U9
6240-IS0-0232-0	IC(LINE DRIVER)	ICL232CBE(SMD)	EA	1	U1
6290-IBR-0153-0	BRIDGE-DIODE	RB-153	EA	2	BD1,2
6291-IPO-4004-0	POWER-DIODE	1N4004	EA	2	D1,2
6292-IZE-4736-0	ZENER-DIODE	6.8V/1W	EA	2	ZD1,2
6515-CJ3-0300-0	RESISTOR 1/4W	CFR 30K (±5%)	EA	1	R1
6527-ID3-0010-0	RESISTOR-CHIP 1/10W	RR1220P-102D(1K)	EA	2	R19,21
6527-IF0-0003-0	RESISTOR-CHIP 1/10W	FTR 0805 331 FR(3Ω)	EA	1	R23
6527-IF0-0051-0	RESISTOR-CHIP 1/10W	FTR 0805 331 FR(51Ω)	EA	2	R20,22
6550-M05-0472-0	RESISTOR-NETWORK	M5-1-472J	EA	1	
6700-C25-0003-0	TANTAL-CONDENSER	3.3uF/25V	EA	1	C12
6704-C25-0100-0	ELECTRIC-CONDENSER	100UF/25V	EA	2	EC4,5
6704-C25-0470-0	ELECTRIC-CONDENSER	470uF/25V	EA	1	EC2



6704-C25-1000-0	ELECTRIC-CONDENSER	1000UF/25V	EA	1	EC3
6704-C50-0004-0	ELECTRIC-CONDENSER	4.7uF/50V	EA	1	C11
6704-C50-0330-0	ELECTRIC-CONDENSER	330UF/50V	EA	1	EC1
6710-CAP-0104-0	CERAMIC-CONDENSER	0.1UF/25V(50V)	EA	4	C1,2,3,4
6712-CHP-0103-0	CHIP CONDENSER	CL21F 103 KBNC	EA	1	C13
6712-CHP-0104-0	CHIP CONDENSER	CL21F 104 KBNC	EA	12	C7,8,9,10,22,23,24,25,26, 27,28,42
6712-CHP-0222-0	CHIP CONDENSER	CL21F 222KBNC	EA	2	C20,21
6800-F00-3565-A	EMI BEAD FILTER	BFD-3565 R2	EA	2	L1,2
6830-F00-0040-0	NOISE FILTER	NFB-103S(삼일부품)	EA	1	NFB-103S(삼일)
7801-CLW-0008-0	CONNECTOR(WAFER)	LW 0640-08	EA	1	CON8
7801-CLW-0009-0	CONNECTOR(WAFER)	LW 0640-09	EA	1	CON7
7812-C00-0009-B	D-SUB CONNECTOR	RD9S	EA	1	
7812-C00-0025-0	D-SUB CONNECTOR	D25S R-ANGEL(PD-1,LP-2	EA	1	
7813-C00-0016-0	SOCKET CONNECTOR	5332-16P	EA	1	

PARTS NAME : BODY ASS'Y [PPP-PD0-MBOD-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
1000-A00-0134-0	TRAY	PD-II	EA	1	
1030-A00-0208-0	BODY COVER	PD-II	EA	1	
1030-A00-0210-0	SIDE BRACKET	PD-II	EA	1	
1050-A00-0002-0	SELECT S/W COVER	30*13*0.5T(AL)	EA	1	
1100-A00-0056-0	BODY	PD-II	EA	1	
1261-A00-0009-0	LIMIT BOLT	M5*0.8*9.2(BSBM 6Kg)	EA	1	
1502-A00-0306-0	SCREW-MACHINE(PH)	M3*6	EA	2	SELECT SWITCH COVER
1502-MPN-0406-0	SCREW-MACHINE(PH)	M4*6-NI	EA	14	BODY COVER , POWER ASS'Y,MAIN PCB
1505-MSU-0410-0	SCREW-MACHINE(TH)	M4*10-SUS	EA	4	DISPLAY ASS'Y , SIDE PLATE
1535-MSU-0620-0	BOLT-WRENCH(WA)	M6*20-SUS	EA	4	L/C(BODY , PLATFORM)
1563-A00-0308-0	RIVET	φ3.2*8	EA	2	SPEC PLATE
1810-DB2-0000-0	SPEC PLATE	DB- II 내수	EA	1	
2610-A00-0002-B	FOOT	M8*37*φ30 (PD,EP) SUS	EA	4	

PARTS NAME : C/T BOX ASS'Y [PPP-PD0-MCTB-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
1260-A00-0015-0	SEALING BOLT	M3*9(CI-3000A,CASTON)	EA	2	
7560-PAC-0001-0	AC CORD(ND공용)	(내수.폴란드.필리핀)	EA	1	
9100-PD2-0130-0	C/T BOX	무지(PD-II)	EA	1	
9102-PD2-4640-0	PAD	460*405 (PD-II)	EA	0	
9204-AS0-0013-0	STYROFOAM BOX	PD-II(400*160*100)	EA	2	
9301-A00-0003-0	POLY BAG(MANUAL)	170*250*0.05T	EA	1	
9303-A00-0004-0	POLY BAG(HEAD)	350*450*0.05T	EA	1	TRAY
9304-A00-0005-A	POLY BAG(SET,HD)	450*580*0.04T(M)	EA	1	PD-II ASS'Y
9400-A00-0046-0	SILICAGEL	10 g	EA	1	
9900-A00-0001-0	봉인납	수출용	EA	1	
9900-A00-0002-0	SEALING WIRE	300M/ROLL	EA	0	



PARTS NAME : DISPLAY ASS'Y [PPP-PD0-MDIS-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
1512-A00-0306-0	SCREW-TAPPING(PH)-2	M3*6	EA	4	DISPLAY PCB
1512-A00-0308-0	SCREW-TAPPING(PH)-2	M3*8	EA	2	FRONT CASE
1550-A00-0305-0	WASHER (FLAT)	φ3*φ6*0.5	EA	2	FRONT CASE
2004-A00-0043-0	FRONT CASE	PD-II	EA	1	
2004-A00-0044-0	BOTTOM CASE	PD-II	EA	1	
2010-A00-0024-0	DISPLAY FILTER	104.9*34.4*1t (SMOG)	EA	1	
2200-PD2-1533-0	KEY BOARD PAD	PD-II(15kg) 영공	EA	1	

PARTS NAME : DISPLAY ASS'Y [PPP-PD0-MDIS-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
1100-A00-0057-0	PLATFORM	PD-II	EA	1	
1502-A00-0415-0	SCREW-MACHINE(PH)	M4*0.7*15	EA	4	PLATFORM RUBBER
1532-MST-0415-0	WRENCH BOLT(ST)	M4*0.7*15-SUS(NYLOK)	EA	4	LIMIT
2022-A00-0003-0	W/L GAGE ASS'Y	φ19*φ21*14.5(BLACK)	EA	1	
2600-A00-0080-0	PLATFORM RUBBER	PD-II	EA	4	
2631-A00-0025-0	PLATFORM CUSHION	35*18*1.6t NBR BLACK	EA	6	



PARTS NAME : POWER ASS'Y [PPP-PD0-MPOW-PPPP-P1]

Parts Code	Parts Name	Size	Unit	Q'ty	Remark
1030-A00-0211-0	TRANS BRACKET	PD-II	EA	1	
1502-A00-0305-0	SCREW-MACHINE(PH)	M3*5	EA	2	NOISE FILTER
1502-A00-0306-0	SCREW-MACHINE(PH)	M3*6	EA	3	POWER PCB
1503-A00-0406-0	MACHINE SCREW (WPH)	M4*6	EA	2	TRANS
1550-A00-0305-0	WASHER (FLAT)	φ3*φ6*0.5	EA	2	NOISE FILTER
1552-A00-0300-0	WASHER (OTO)	φ3	EA	1	NOISE FILTER (접지)
7502-PAP-0220-0	POWER TRANS(48)	220V/50~60Hz(AP)	EA	1	POWER TRANS(48)
7612-S00-0004-0	AC SOCKET CONNECTER (I 3P-0717 (FUSE))	웰포인	EA	1	AC SOCKET INLET
7620-S05-0250-0	FUSE	250mA/250V φ5 UL,S,VD	EA	2	FUSE