CAS
CORPORATION

PD-II MANUAL

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CAS CORPORATION

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	***Single Interval*** 6 kg	***Single Interval*** 15 kg	***Single Interval*** 30 kg	***Single Interval*** 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,oz			
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			

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Pound(lb) Version (UL)

MODEL	PD2 – 15LB	PD2 – 30LB	PD2 – 60LB	PD2-150LB
Capacity	***Single Interval*** 15 lb / 0.005 lb ***Dual Interval*** 6 lb / 0.002 lb 15 lb / 0.005 lb	***Single Interval*** 30 lb/ 0.01 lb ***Dual Interval*** 15lb / 0.005 lb 30 lb/ 0.01 lb	***Single Interval*** 60 lb/ 0.02 lb ***Dual Interval*** 30 lb/ 0.01 lb 60 lb/ 0.02 lb	***Single Interval*** 150 lb / 0.05 lb ***Dual Interval*** 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,kg,lb,oz			
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			

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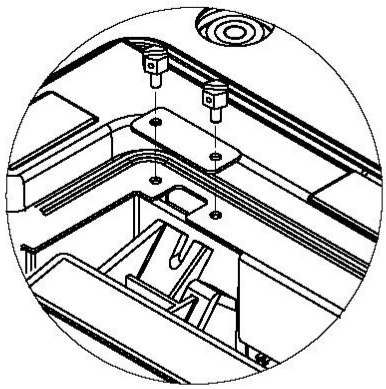
Ounce (oz) Version (UL)

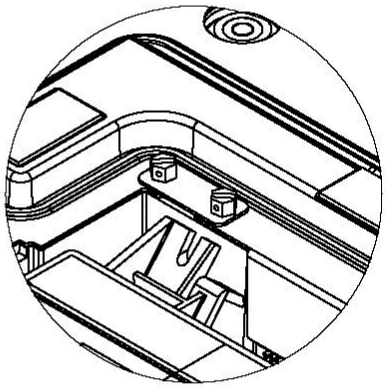
MODEL	PD2 – 300oz	PD2 – 600oz	PD2 – 1000oz	PD2-2000oz
Capacity	***Single Interval*** 300 oz / 0.1 oz ***Dual Interval*** 150 oz / 0.05 oz 300 oz / 0.1 oz	***Single Interval*** 600 oz / 0.2 oz ***Dual Interval*** 300 oz / 0.1 oz 600 oz/ 0.2 oz	***Single Interval*** 1000 oz / 0.5 oz ***Dual Interval*** 400 oz / 0.2 lb 1000 oz / 0.5 oz	***Single Interval*** 2000 oz / 1 oz ***Dual Interval*** 1000 oz / 0.5 oz 2000 oz / 1 oz
INTERNAL RESOLUTION	1 / 90,000	1 / 90,000	1 / 100,000	1 / 100,000
EXTERNAL RESOLUTION	1 / 3,000	1 / 3,000	1 / 2,000	1 / 2,000
Display	VFD 6 digit			
DISPLAY LAMP	STABLE, ZERO,kg,lb,oz			
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			

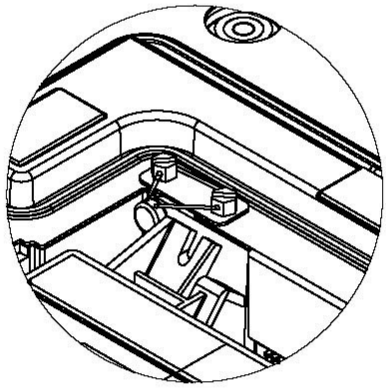
1.4. Sealing Method

REVISIONS

MODEL NO.	PART NO.	REV	SYM	CONTENTS	DRAWN	CHECKED	APPROVED







NO	PARTS NAME	SPECIFICATION	Q'TY	REMARK

TOLERANCES .UNLESS OTHERWISE SPECIFIED ANGULAR ± N/A	NAME OR TITLE SEALING METHOD	CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO,KOREA
DECIMAL ± N/A	FIRST USED IN ASSEMBLY: POSTAL SCALE	MATERIAL: N/A
Q'TY/SET: 1/1	FIRST MADE FOR: PD-II	END FINISH: N/A
	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/S	3000-PD2-0003	00
. .20	. .20	. .20	. .20			

CAS FORM A4 (210mmx297mm)

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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 pariculars 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)

<table>
<tr><th>B7</th><th>B6</th><th>B5</th><th>B4</th><th>B3</th><th>B2</th><th>B1</th><th>B0</th></tr>
<tr><td>tare</td><td>Calibration Unit</td><td>NTEP</td><td colspan="2">Display Unit</td><td>Initial Zero</td><td>TARE Relase</td><td>TARE</td></tr>
<tr><td>0: on
1: off</td><td rowspan="2">0:kg
1:lb</td><td>0: Others</td><td colspan="2" rowspan="2">00:kg
01:lb
10:oz</td><td>0:10%</td><td>0:TARE
1:TARE, ZERO</td><td>0:Successive Tare
1:One time Tare</td></tr>
<tr><td>Ntep(B5 bit) 설정시는 only off</td><td>1: NTEP</td><td>1:2%</td><td>Don’t care</td><td>Don’t care</td></tr>
</table>

2.4.2 Capacity Setting(C–4–2)

<table>
<tr><th>B7</th><th>B6</th><th>B5</th><th>B4</th><th>B3</th><th>B2</th><th>B1</th><th>B0</th></tr>
<tr><td colspan="5">CAPACITY</td><td colspan="2">INTERVAL</td><td></td></tr>
<tr><td colspan="3"></td><td>Kg</td><td>lb</td><td>Oz</td><td colspan="2" rowspan="5">00 : Single
01 : Dual</td><td></td></tr>
<tr><td colspan="3">00011</td><td>6</td><td>15</td><td>300</td><td></td></tr>
<tr><td colspan="3">00111</td><td>15</td><td>30</td><td>600</td><td></td></tr>
<tr><td colspan="3">01001</td><td>30</td><td>60</td><td>1000</td><td></td></tr>
<tr><td colspan="3">01100</td><td>60</td><td>150</td><td>2000</td><td></td></tr>
</table>

2.4.3 Comma Setting (C–4–3)

B7	B6	B5	B4	B3	B2	B1	B0
Comma Dislplay							Decimal point Display
1: Possible 0: Impossible							0 : Down to two decimal point 1 : Down to three decimal point

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

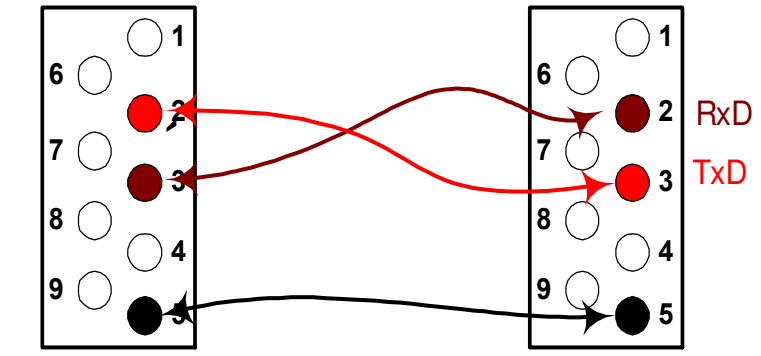
	MENU	Description
		RS-232 Serial
	ECR-TYPE 0	Most P.O.S, ECRs and Some TEC P.O.S System
	ECR-TYPE 1	
	ECR-TYPE 2	SHARP ER-Axxx, ER-A450T, New SANYO ECRs using RS-232 and others
	ECR-TYPE 3	Most P.O.S System
	ECR-TYPE 4	CRS, NCR2170, SAMAUNG ER-5100, ER5115 and Many other ECRs
	ECR-TYPE 5	NCI General.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

※ 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	Bit3	Bit 2	Bit 1	Bit 0

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

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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) OZ = The Characters O and Z

(E) S = The Character S

(F) 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>

(G) XX.XXX = Weight value

(H) LB = The Characters L and B

(I) KG = The Characters K and G

(J) OZ = The Characters O and Z

(K) 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> PROTOCOI

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		

- Remark

- STA : A WEIGHING STATUS OF THE SCALE
  SCALE IS STABLE ->”S”, NOT STABLE -> “U”
- SIGN : SIGN OF THE WEIGHT DATA
  ZERO AND POSITIVE WEIGHT -> “ “ , NEGATIVE WEIGHT -> “-“
  OVER LOAD -> “F”
- W5 THROUGH W0 –> WEIGHT DATA
  BUT ALL “F” WHEN THE SCALE IS PUT ON OVER LOAD.
- UN1 THROUGH UN0 -> UNIT OF WEIGHT (Kg ,Lb,oz)
- BCC : BLOCK CHECK CHARACTER

3.1.7 TYPE-7 INTERFACE

: RS-232C Interface

- ➔ 8 Data bit
- ➔ None parity
- ➔ 1 stop bit
- ➔ 9600 baud rate
- ➔ SAMSUNG ECR (SPAIN)

1) PROTOCOL

ECR SCALE(PD-II)

Command ----------→

<$>

←---------- Response

XXX.XXX <CR>

cf) $: 24H (ASCII code)

"." : 2EH (ASCII code)

CR : ODH (ASCII code)

Ex)

Weight : 12.34 kg

ECR SCALE

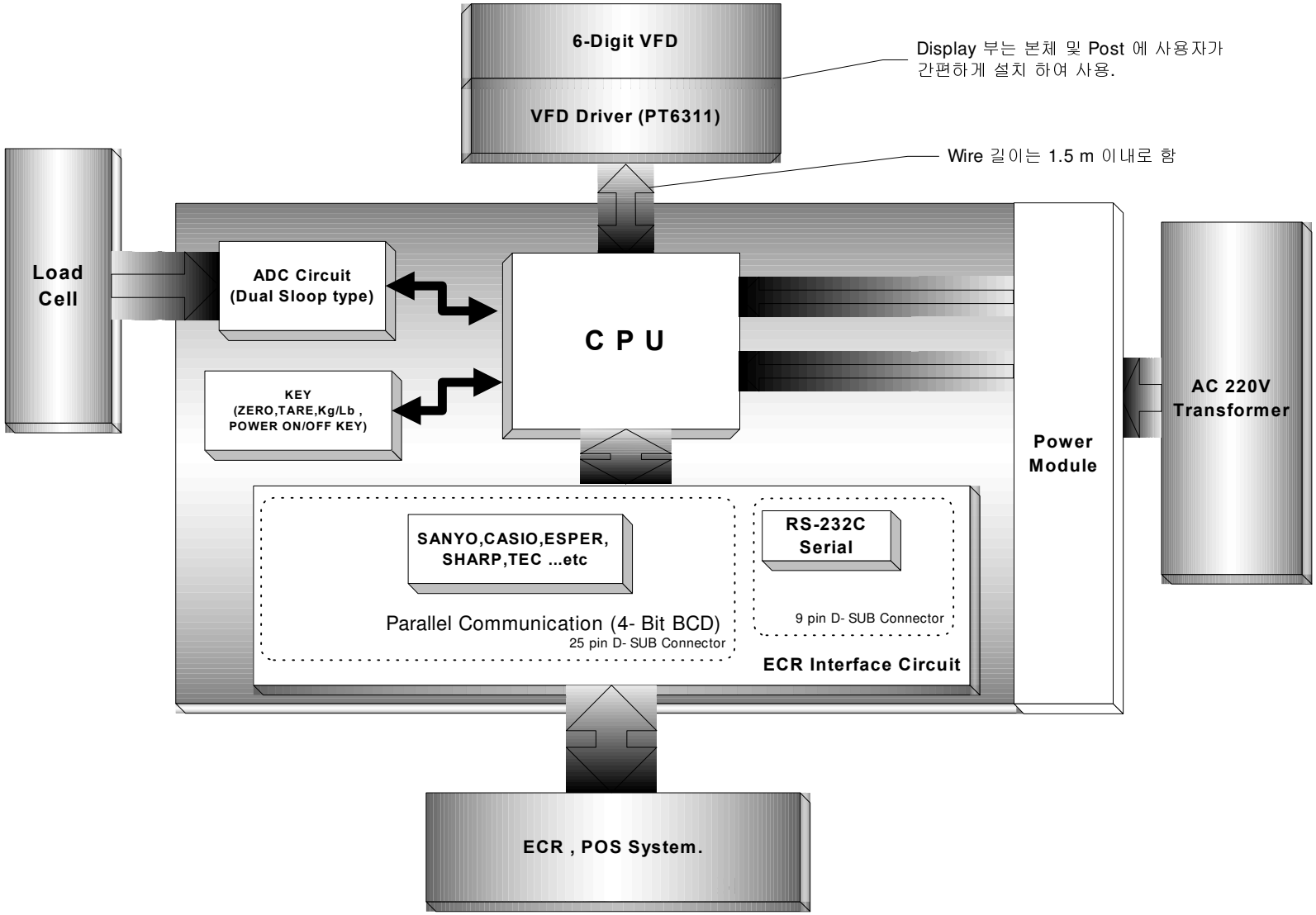
$<24H> ------→

←------ <30H><31H><32H><2EH><3H><34H><0DH> : ASCII code

0 1 2 . 3 4 CR

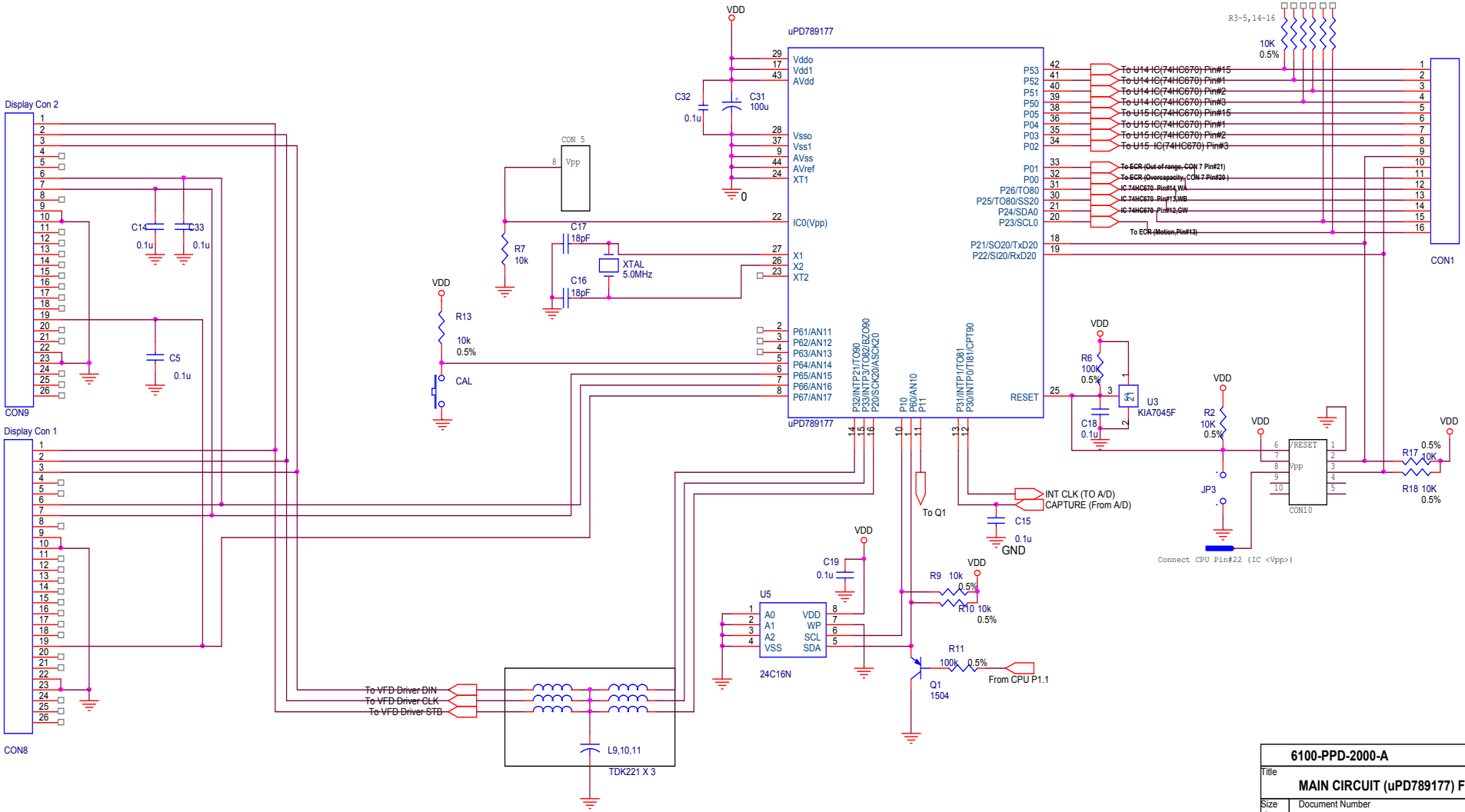
3 The Schematics and Diagram

4.1 System Block Diagram



4.2 Circuit Diagram

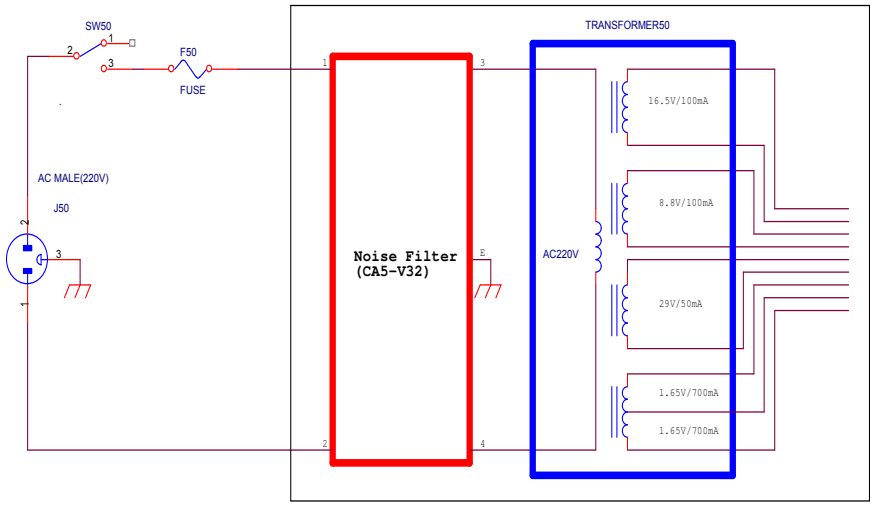
4.2.1 Main

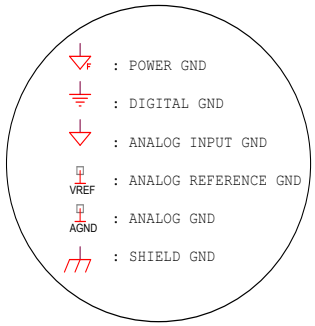


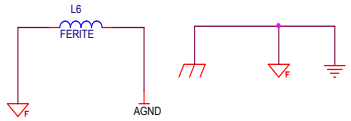
6100-PPD-2000-A		
Title: MAIN CIRCUIT (uPD789177) For VFD		
Size: Custom	Document Number: First Drawing H.J	Rev
Date: Tuesday, August 12, 2003	Sheet 1 of 1	

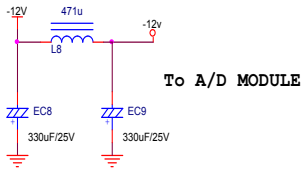
CAS CORPORATION

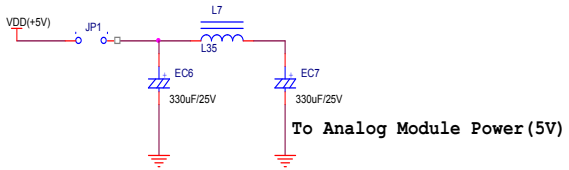
4.2.2 Power

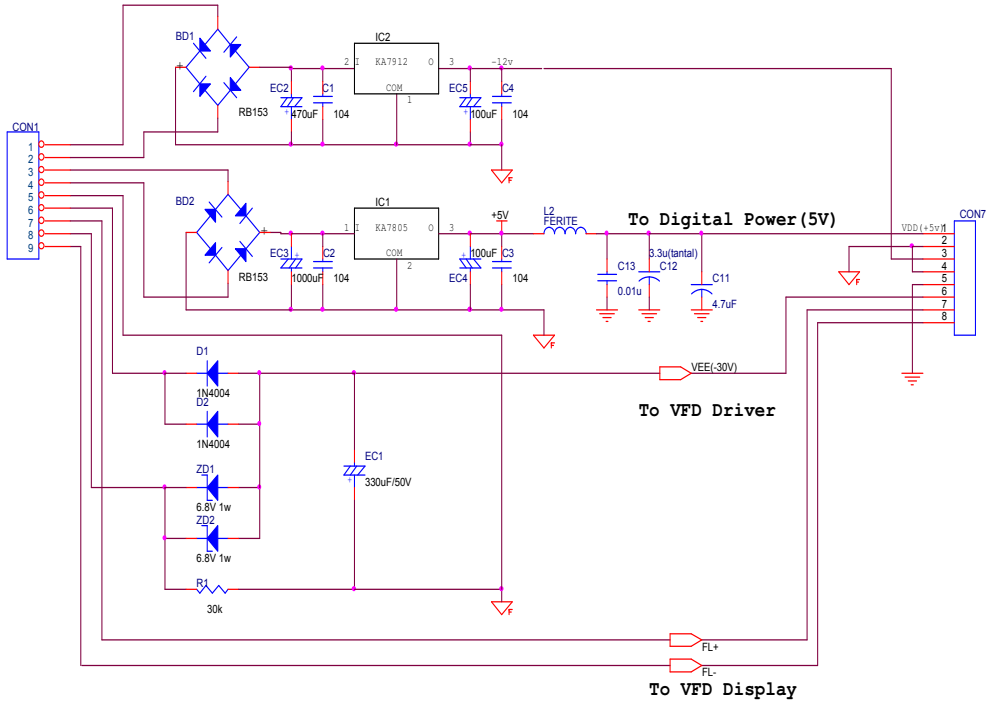








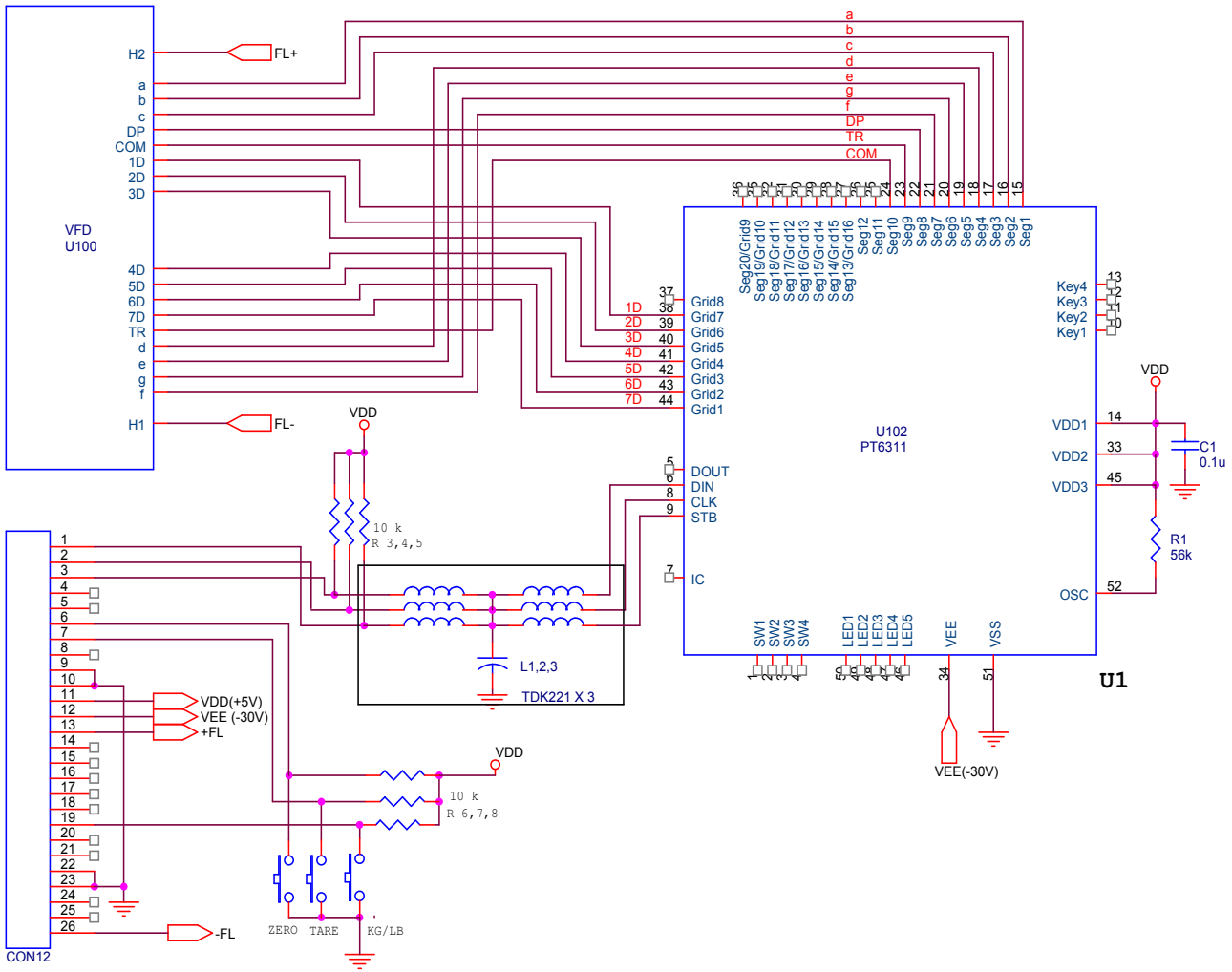




6140-PPD-2000-A			
Title: Power Circuit for PD-II VFD Version			
Size: Custom	Document Number: <Doc>		Rev: <RevCode>
Date: Tuesday, August 12, 2003	Sheet 1 of 1		

CAS CORPORATION

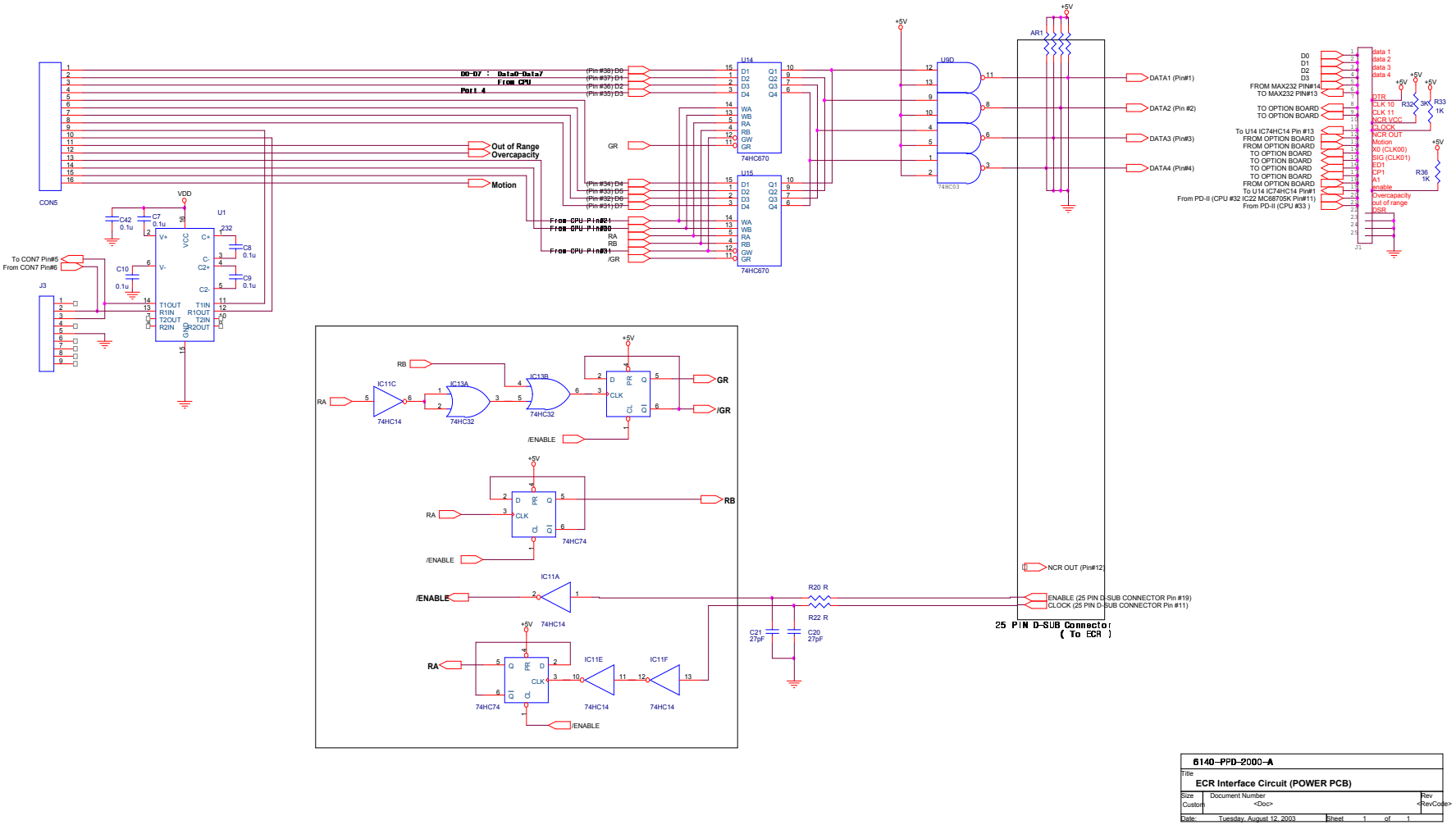
4.2.3 Display



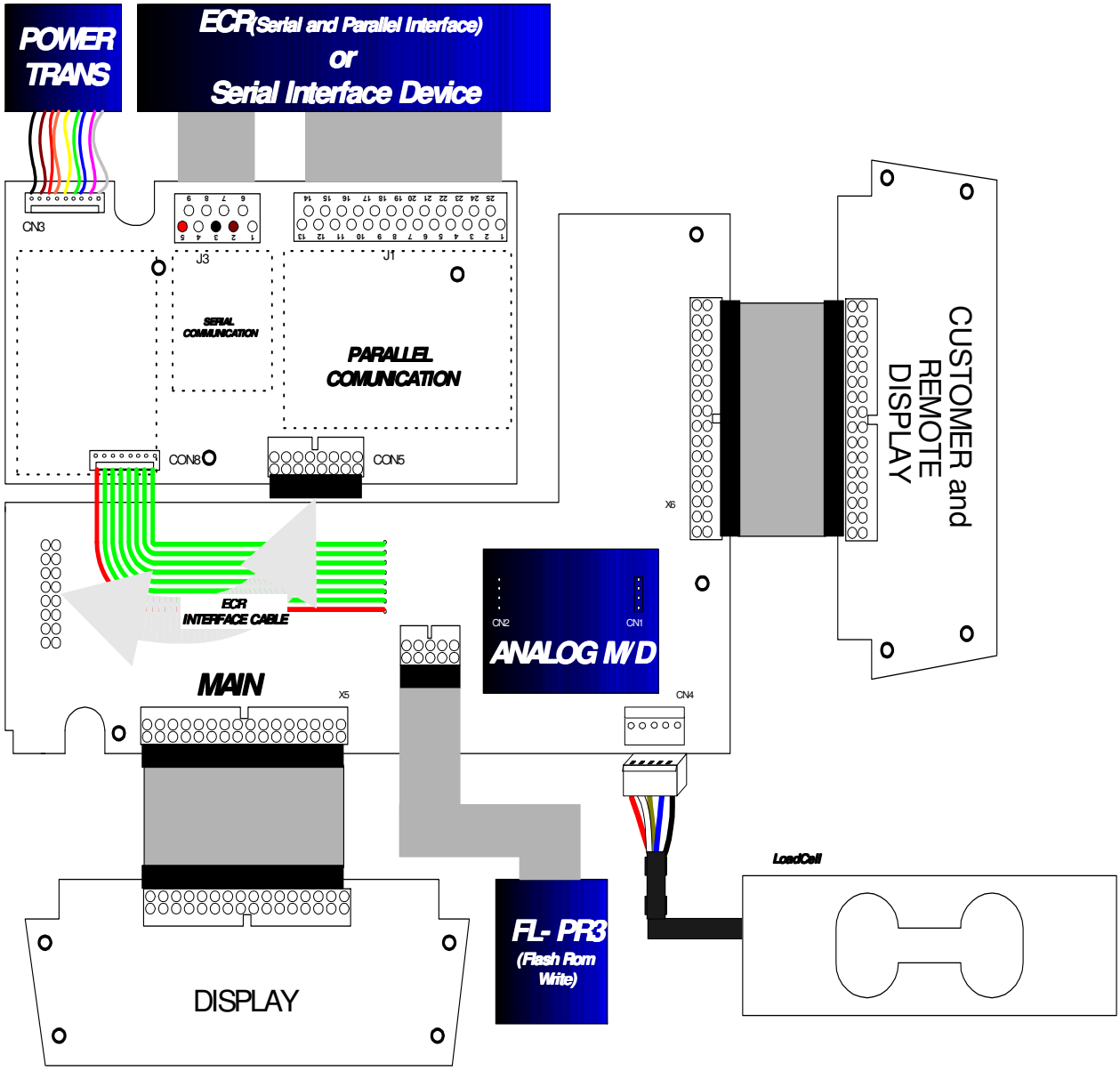
	6110-PPD-2000-A	
Title	PD-II DISPLAY PART (MAIN)	
Size: Custom	Document Number Designed by H.J Chang	Rev: <RevCode>
Date: Tuesday, August 12, 2003	Sheet 1 of 1	

CAS CORPORATION

4.2.4 Communication (Serial and Parallel)



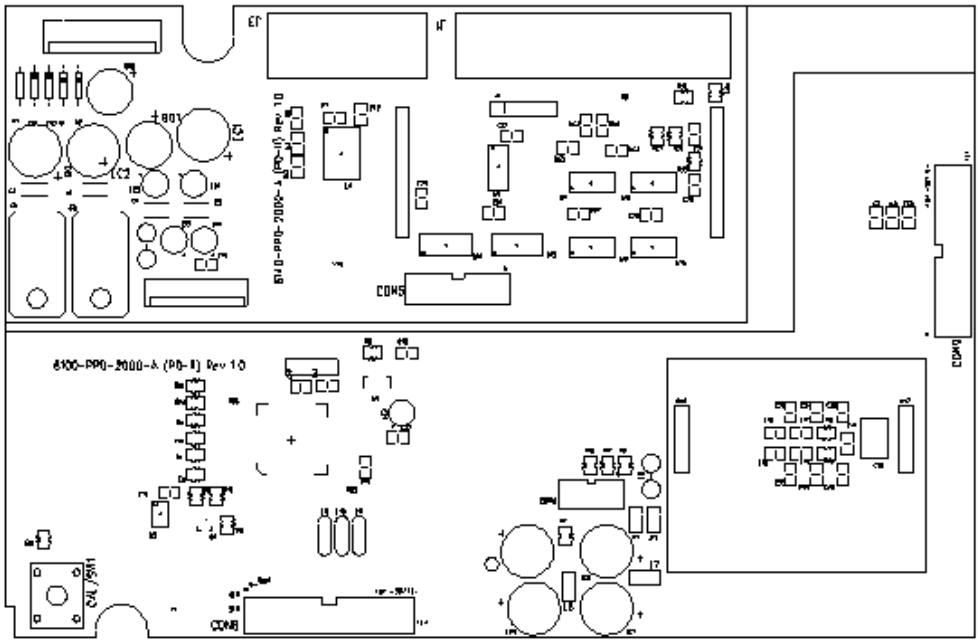
4.3 Wiring Diagram



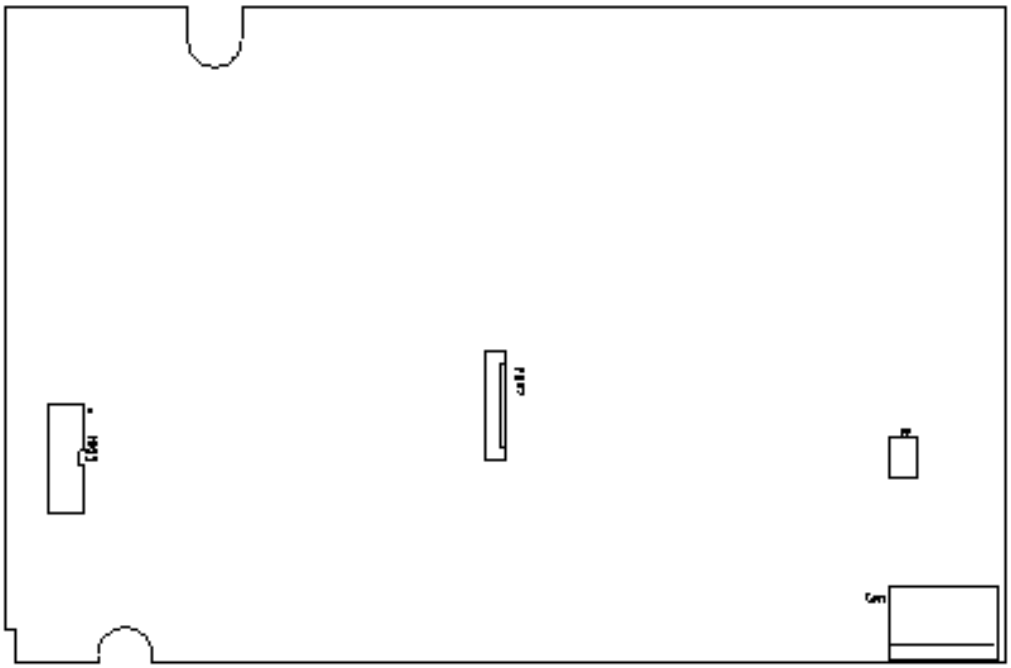
4.4 Parts Location

4.4.1 Main and Power Part

4.4.1.1 TOP

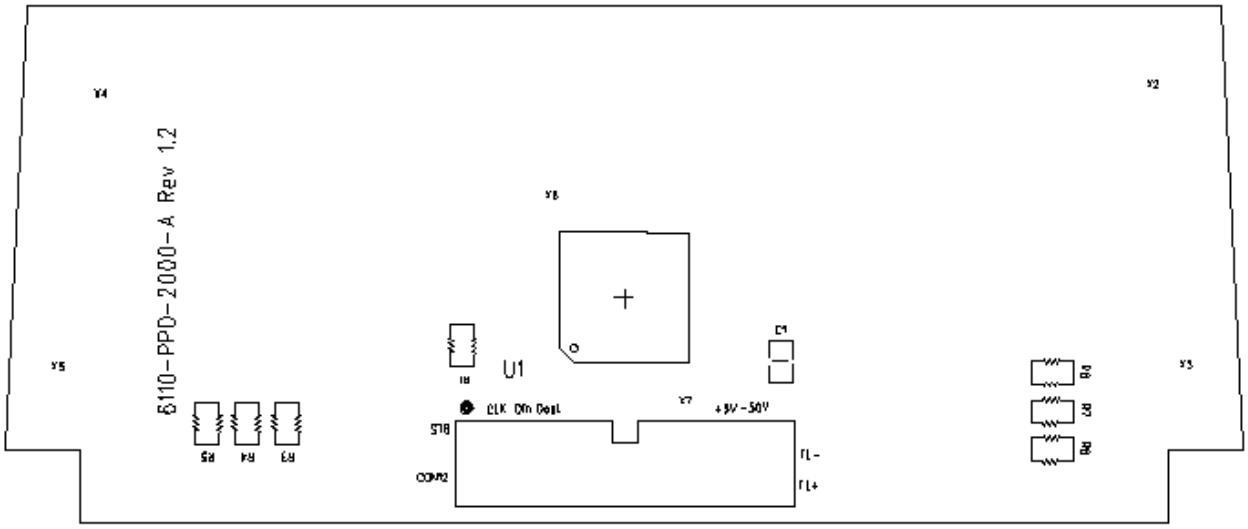


4.4.1.2 Bottom

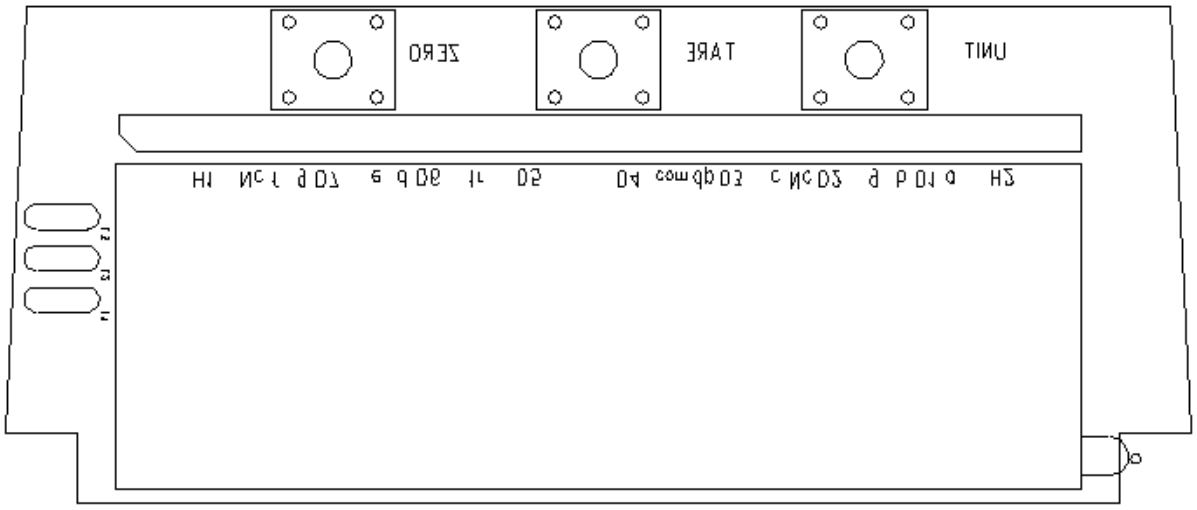


4.4.2 Display Part

4.4.2.1 Top

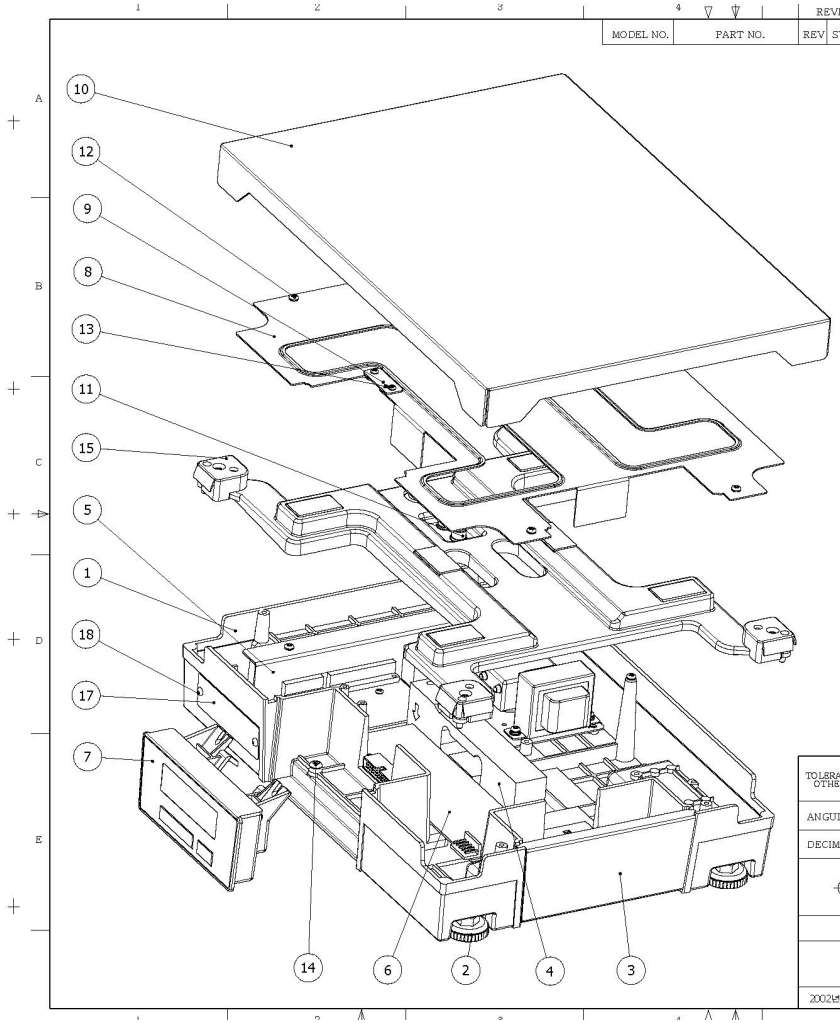


4.4.2.2 Bottom



CAS CORPORATION

5 EXPLODED VIEW



BODY ASS'Y

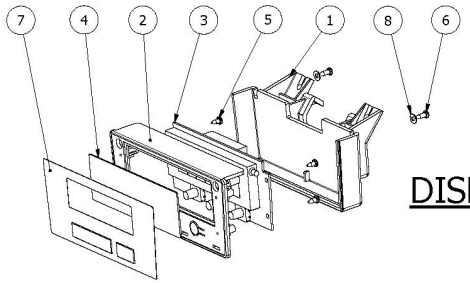
NO.	PARTS NO.	REV	PARTS NAME	SPECIFICATION	MATERIAL	Q'TY
1	1100-A00-0056	0	BODY	372*272*65	ALCD 8	1
2	2610-A00-0002	B	FOOT	M8*37*ø30	NBR	4
3	1030-A00-0210	0	SIDE PLATE	144*30.8*60.1	SPC 1.0t	1
4	LLBBCA303G000000		BCA-30L	30kg	AL-Alloy	1
5	PPP-PD0-MPOW-PPPP-P1		POWER ASS'Y	-	-	1
6	PPP-PD0-EMAP-PPPP-P1		MAIN PCB	SPEC	MATERIAL	1
7	PPP-PD0-MDIS-PPPP-P1		DISPLAY ASS'Y	-	-	1
8	1030-A00-0208	0	BODY COVER	371*271*31*1.0t	SPC 1.0t	1
9	1050-A00-0002	0	SELECT SWITCH COVER	AL 0.5t	SPC 1.0t	1
10	1000-A00-0134	0	TRAY	380*280*31.2*1.5t	SUS 304 1.5t	1
11	1535-MSU-0620	0	WRENCH BOLT (WA)	M6*20	SUS	4
12	1502-MPN-0406	0	MACHINE SCREW (PH)	M4*P0.7*6	*	14
13	1502-A00-0306	0	MACHINE SCREW (PH)	M3*P0.5*6	-	2
14	1505-MSU-0410	0	MACHINE SCREW (TH)	M4*P0.7*10	SUS	4
15	PPP-PD0-MPLA-PPPP-P1		PLATFORM ASS'Y	-	-	1
16	1261-A00-0009	0	LIMIT BOLT	M5*P0.8*9.2(BSBM 6kg)	BSBM	1
17	1810-DB2-0000	0	SPEC PLATE	DB-II	AL SHEET	1
18	1563-A00-0308	0	RIVET	f 3.2*8	-	2

TOLERANCES :UNLESS OTHERWISE SPECIFIED	NAME OR TITLE	EXPLODED VIEW(1/2)	CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO,KOREA		
ANGULAR ± ORD.					
DECIMAL ± ORD.	FIRST USED IN ASSEMBLY	POSTAL SCALE	MATERIAL	N/A	
	FIRST MADE FOR	PD-II	END FINISH	N/A	
	CONTRACT OR CUSTOMEDR NO.	WORLD WIDE	DO NOT SCALE DRAWING	DIMENSIONS ARE IN MM,INCH	
DRAWN	CHECKED	APPROVED	SCALE	PART NO.	
			N/S	3000-PD2-0001-0	
2002년 12월 17일 화요일 오후 3:56:57	2002. .	2002. .	EXP-BODY.SLDDRW		

CAS FORM A3 (297mmx420mm)

CAS CORPORATION

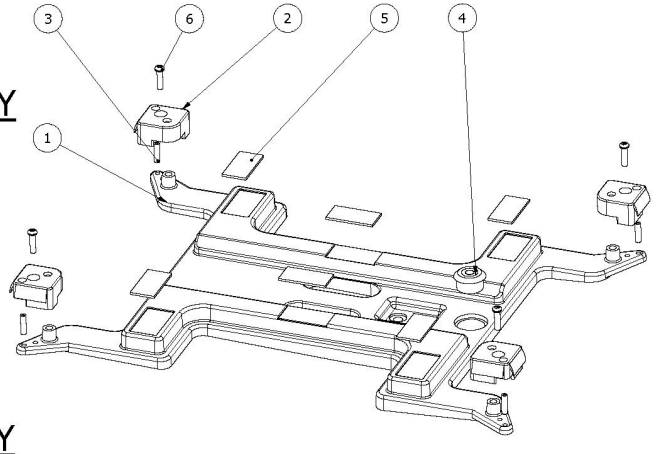
MODEL NO.	PART NO.	REVISIONS REV	SYM	CONTENTS	DRAWN	CHECKED	APPROVED



DISPLAY ASS'Y

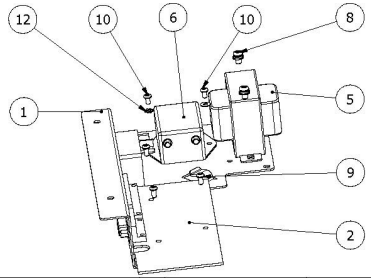
NO.	PARTS NO.	REV	PARTS NAME	SPECIFICATION	MATERIAL	Q'TY
1	2004-A00-0044	0	BOTTOM CASE	60g	ABS KUMHO 750-94273	1
2	2004-A00-0043	0	FRONT CASE	20g	ABS KUMHO 750-94273	1
3	PPP-PD0-EDIS-PPPP-P1		DISPLAY PCB	3KEY , 6DIGIT VFD	-	1
4	2010-A00-0024	0	DISPLAY FILTER	104.9*34.4*1t	PC	1
5	1512-A00-0306	0	TAPPING SCREW (PH)-2	M3*P0.5*6	*	4
6	1512-A00-0308	0	TAPPING SCREW (PH)-2	M3*P0.5*8	*	2
7	2200-PD2-1533	0	KEY BOARD PAD	PD-II (15kg) ENGLISH	PET 0.2t	1
8	1550-A00-0305	0	WASHER (FLAT)	f 3*f 6*0.5	*	2

PLATFORM ASS'Y



NO.	PARTS NO.	REV	PARTS NAME	SPECIFICATION	MATERIAL	Q'TY
1	1100-A00-0057	0	PLATFORM	PD-II	ALDC 8	1
2	2600-A00-0080	0	PLATFORM RUBBER	29.5*29.5*17	NBR BLACK	4
3	1532-MST-0415	0	WRENCH BOLT (ST)	M4*P0.7*15-NYLOK	SUS	4
4	2022-A00-0003	0	W/L GAGE ASS'Y	ø19*ø21*14.5(BLACK)	*	1
5	2631-A00-0025	0	PLATFORM CUSHION	35*18*1.6t	NBR	6
6	1502-A00-0415	0	MACHINE SCREW(PH)	M4*P0.7*15	N/A	4

POWER ASS'Y



NO.	PARTS NO.	REV	PARTS NAME	SPECIFICATION	MATERIAL	Q'TY
1	1030-A00-0211	0	TRANS BRACKET	PD-II	SPC 1.2t	1
2	PPP-PD0-EPOW-PPPP-P1		POWER PCB ASS'Y	PD-II (POWER)	PCB	1
3	7812-C00-0009-B		D-SUB CONNECTOR	RD9S	-	1
4	7812-C00-0025-0		D-SUB CONNECTOR	D2SSR-ANGLE	-	1
5	7502-PAP-0220-0		POWER TRANS(48)	250mA/250V	-	1
6	6830-F00-0040-0		NOISE FILTER	NFB-103S(삼일부품)	-	1
7	7612-S00-0004-0		AC SOCKET INLET	-	-	1
8	1503-A00-0406	0	MACHINE SCREW (WPH)	M4*P0.7*6	-	2
9	1502-A00-0306	0	MACHINE SCREW (PH)	M3*P0.5*6	-	3
10	1502-A00-0305	0	MACHINE SCREW (PH)	M3*P0.5*5	*	2
11	1550-A00-0305	0	WASHER (FLAT)	f 3*f 6*0.5	*	1
12	1552-A00-0300	0	WASHER (OTO)	f 3	-	1

TOLERANCES :UNLESS OTHERWISE SPECIFIED	NAME OR TITLE: EXPLODED VIEW(2/2)		CAS CORPORATION #19 KANAP-RI KWANGJEOK-MYON YANGJU-KUN KYUNGKI-DO,KOREA
ANGULAR ± ORD.			
DECIMAL ± ORD.	FIRST USED IN ASSEMBLY: POSTAL SCALE		MATERIAL: N/A
	FIRST MADE FOR: PD-II		END FINISH: N/A
	CONTRACT OR CUSTOMEDR NO.: WORLD WIDE		DO NOT SCALE DRAWING / DIMENSIONS ARE IN MM/INCH

DRAWN	CHECKED	APPROVED	SCALE	PART NO.
			N/S	3000-PD2-0002-0
2002년 12월 17일 화요일 오후 4:32:53	2002. .	2002. .	EXP-PLAT.SLDDRW	

CAS FORM A3 (297mmx420mm)

CAS CORPORATION

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-MDIC-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	

CAS CORPORATION

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

CAS CORPORATION

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

CAS CORPORATION

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	

CAS CORPORATION

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	

CAS CORPORATION

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	

CAS CORPORATION

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	

CAS CORPORATION

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