KERN & Sohn GmbH
Ziegelei 1
D-72336 Balingen
E-Mail: info@kern-sohn.com
Tel: +49-[0]7433- 9933-0
Fax: +49-[0]7433-9933-149
Internet: www.kern-sohn.com

Service manual

Personal scale, Adiposity scale

KERN MPB, MXS

Version 1.0
2/2010
GB







MPB,MXS-SH-e-1010

GB

KERN MPB, MXS

Version 1.0 2/2010

Service manual

Personal scale, Adiposity scale

Table of Contents

1 Basic Information 3
2 Technical Data 4
3 Overview of Display / Keyboard 5
4 Error Message Indication 6
5 Trouble Shooting 7
6 Calibration 8
6.1 Calibration switch 8
6.2 Calibration procedure 9
7 Zero Count and Span Count Adjustment 11
8 Service Mode 12
8.1 Navigation in the menu 12
8.2 Description 13
8.3 Setting of maximum capacity and resolution 14
9 Schematics 15
10 System Block Diagram 18
11 Display Format 19
12 Assembly Drawing 20
12.1 MPB 300K100 / MPB 300K100P 20
12.2 MXS 300K100 21
12.3 Indicator 22

1 Basic Information

Grundlegende Hinweise

The device must be repaired only by trained specialist staff or personnel with professional formation (such as a repair-specialist accredited by law concerning verification).

The service manual is obligatory for repair work.

After repair, original conditions of the device have to be restored.

Only original spare parts should be used.

Das Gerät darf nur von geschultem oder beruflich ausgebildetem Fachpersonal (z. B. eichrechtlich anerkannter Instandsetzer) repariert werden.

Die Serviceanleitung ist bindend für Reparaturen.

Das Gerät muss nach erfolgter Reparatur wieder in den Originalzustand zurückversetzt werden.

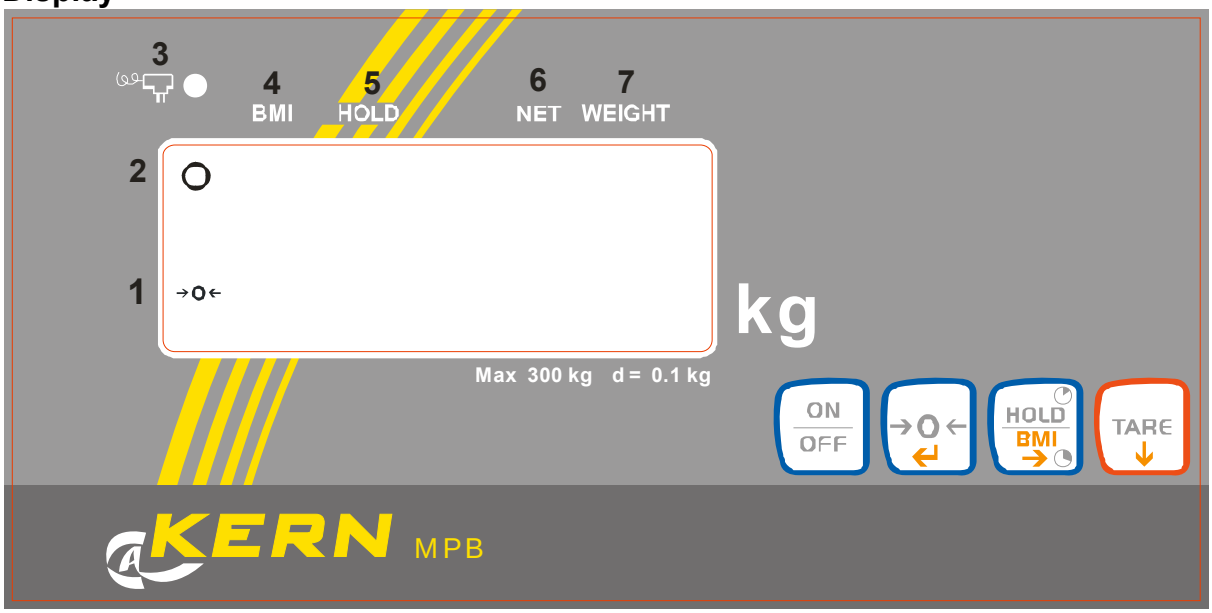
Es dürfen nur Originalersatzteile verwendet werden.

2 Technical Data

KERN	*MPB300K100 / P*	*MXS300K100*
Readability (d)	*100 g*	
Weighing range (max)	*300 kg*	*300kg*
Recommended calibration weight, (class)	*200 kg (M2)*	*200 kg (M2)*
Warm-up time	*minimum 10 min*	
Display	*1.0 inch LCD display with 5 and ½ digits*	
Power supply	*Mains adapter 9V / 100 mA*	
	Battery operation 6 x 1.5V, size AA	
Auto Off	*After 3 min without load change (adjustable)*	
Operating temperature	*+ 5°C … + 35°C*	
Storage temperature	*- 20°C … + 60°C*	
Humidity of air	*max. 80 % (not condensing)*	
Platform (B x D x H)mm	*315x300x60*	*550 x 550x80*
Terminal (B x T x H) mm	*210 x 110 x 48*	
Balance ready for operation (B x D x H) mm	*Without stand: 315x300x60 with stand: 315x440x1010*	*550 x 550x80*

3 Overview of Display / Keyboard

Display



Overview of display

No.	Display	Description
1	**[→0←]**	Balance zero display: Should the balance not display exactly zero despite an empty scale pan, press the **[→0←]** button. Your balance will be set to zero after a short standby time.
2	**[o]**	Stability display: If the display shows the stability display **[o]** the balance is in a stable status. The **[o]** indication disappears if the condition is unstable.
3		Illuminates in the event of power supply via mains adaptor
4	BMI ▲	Calculated BMI value
5	HOLD ▲	Hold/Save function active
6	NET ▲	Net weight will be displayed
7	WEIGHT ▲	Current weight value will be displayed

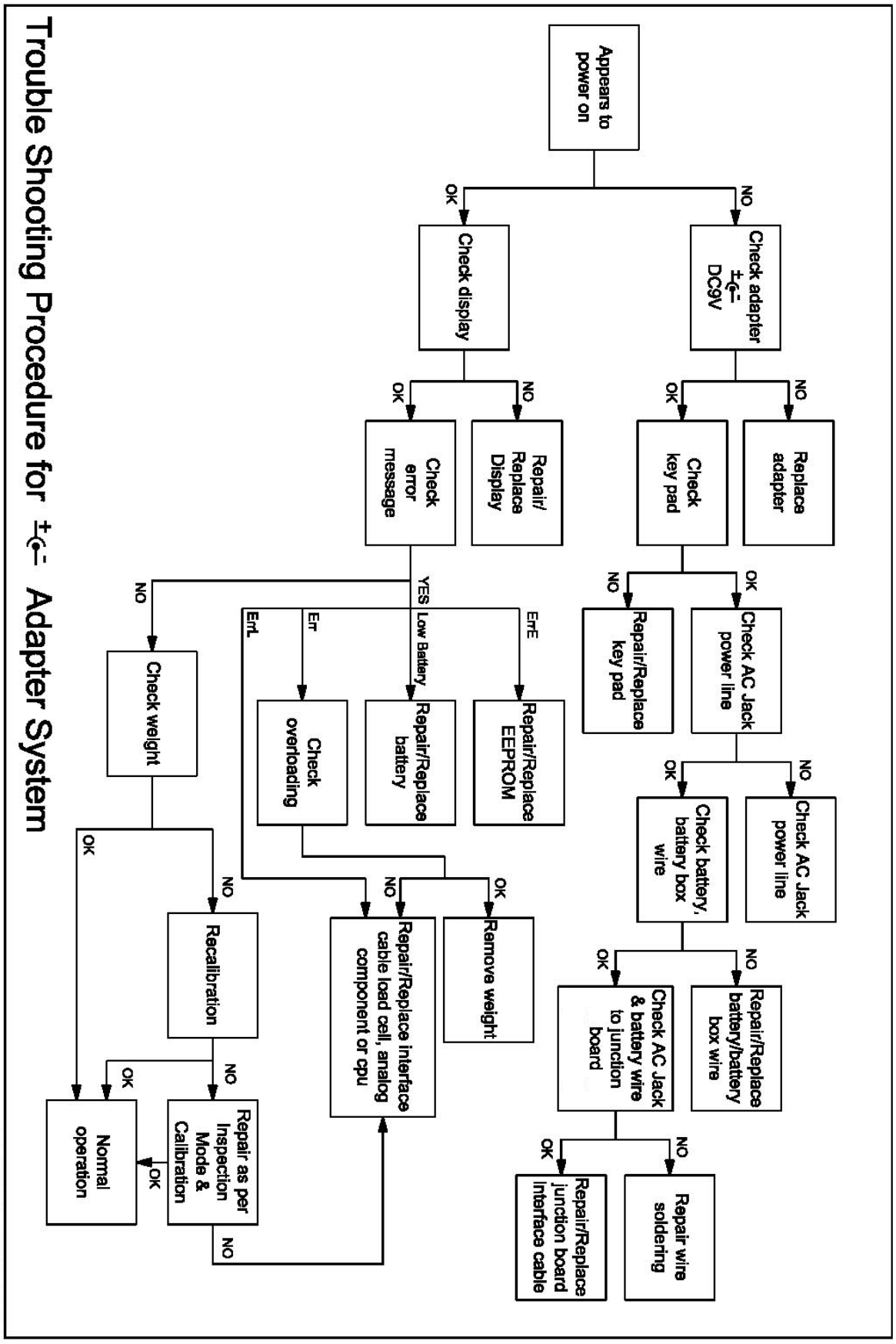
Keyboard overview

Key	Description
ON/OFF	Turn on/off balance
→0← 	Balance will be reset to 0.0 kg. Possible up to max. 2 % or 100% of maximum load (can be selected in the menu) In BMI Mode: Acceptance of input
HOLD	Hold function/Calculation of a stable weight value
BMI 	Function call-up: Body Mass Index In BMI Mode: Moving the input point
TARE 	Tare balance In BMI Mode: Reducing the input value

4 Error Message Indication

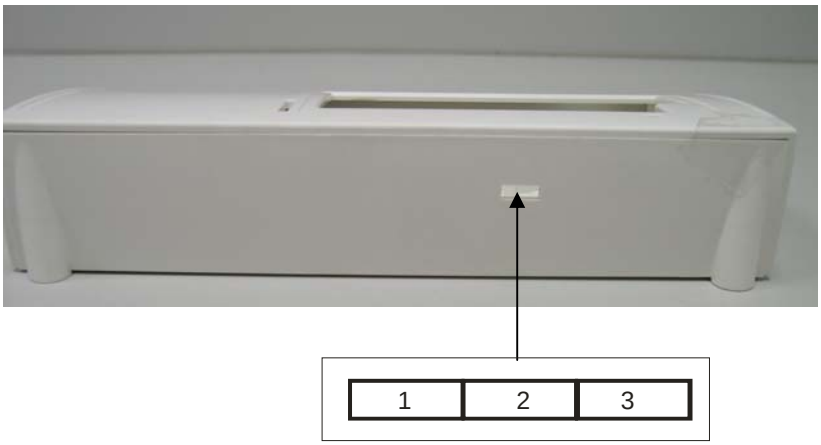
A. **ErrP** : EEprom Error
B. **ErrL** : Low zero count
C. **Err** : High zero count / Overload
D. Lo : Low battery indication
E. ooooo : The scale plate was loaded during switching on the scale

5 Trouble Shooting



6 Calibration

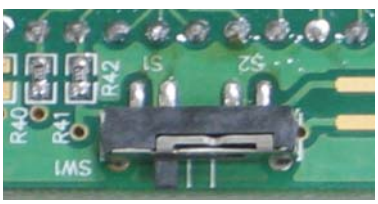
6.1 Calibration switch

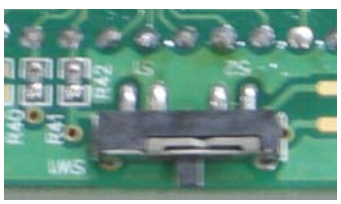


Position of calibration switch	Status
1. to the left	**Test mode** Shows internal count, e.g. 14239
2. concentric	**Service mode** Calibration position (default setting)
3. to the right	Calibration locked (not used)



Switch key

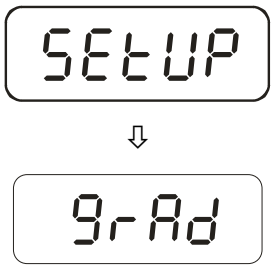
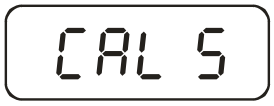






6.2 Calibration procedure

Observe stable environmental conditions. A warming up time of approx. 10 minutes is required for stabilization.

Operation	Display
Turn on balance by pressing the **[ON/OFF]** key	
Keep **[→0←]** button depressed for approx. 3 sec until "SETUP" is displayed followed by "9rAd"	
Press the **[TARE]** button as often as required until "CAL ib" is displayed	
Press the **[HOLD]** button.	
Press the **[TARE]** key. (Zero count mode)	
Press the **[→0←]** button repeatedly until "CAL 0" is displayed.	
Press the **[HOLD]** button.	
Press the **[TARE]** key. Enter the required size of the calibration weight: Press the **[HOLD]** button to select the item to be changed and press the **[TARE]** button to select the numerical value.	
Confirm by pressing the **[→0←]** button.	

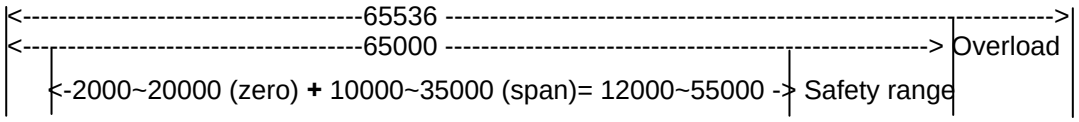
Place the calibration weight carefully in the centre of the weighing plate and a numerical value will appear in the display. Press the **[HOLD]** button. The calibration process is started.	
The balance will automatically return to weighing mode upon successful completion of the calibration and will display the weight of the calibration weight. Take away calibration weight.	
Turn off balance by pressing the **[ON/OFF]** key.	

7 Zero Count and Span Count Adjustment

Note 1:

Capacity	Zero Count	Span Count	Calibration Weight	Span Control (RX)
MPP 300kg	2000~15000	10000~35000	200kg	40K
MXS 300kg	2000~20000	10000~35000	200kg	80K

The **total internal count** is 65536. Overload was set at 65000 (in production).



If the **ZERO COUNT** value is out of range, adjust **R1** or **R2** on the main board.

If zero count is below 2000, use a variable resistor on R1 to adjust the zero count (see note 1 chapter 7).

If zero count is above 20000, use a variable resistor on R2 to adjust the zero count (see note 1 chapter 7).

After determination of the required resistor, solder it on the main board.

If the **SPAN COUNT** value is out of range, adjust **RX** on the main board.

Use a variable resistor on RX to adjust the span count (see note 1 chapter 7).

After determination of the required resistor, solder it on the main board.

8 Service Mode

The calibration switch must be in calibration position (default setting, see chpt. 6.1).

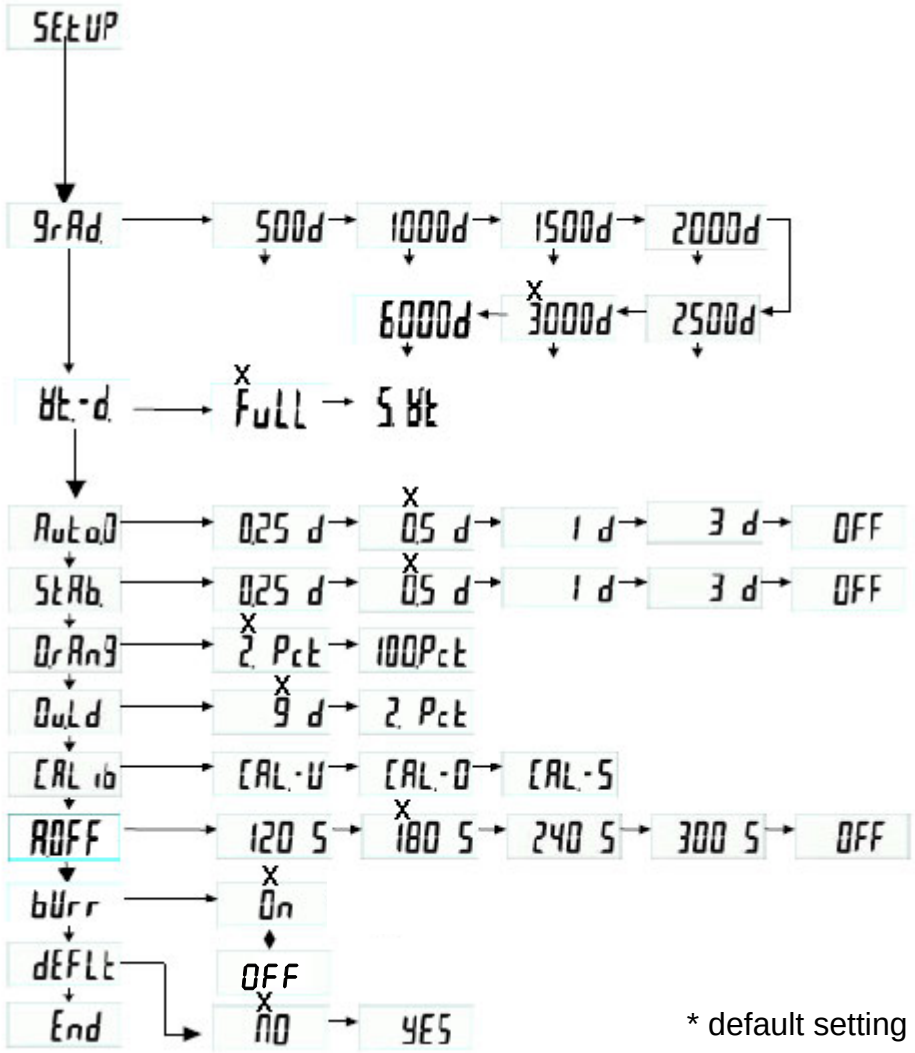
In the service mode all parameters of the balance can be modified.

8.1 Navigation in the menu

- When the scale is switched on, press and hold the **[→0←]**-key for approx. 3 seconds until “SETUP“, followed by ”grAd“ appears.
- Press the **[TARE]**-key repeatedly until the desired function appears.
- Confirm the selected function by pressing the **[HOLD]**-key. The first parameter appears. To select the desired parameter, use the **[HOLD]**-key and confirm by pressing the **[TARE]**-key.

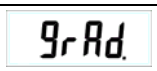
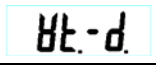
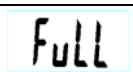
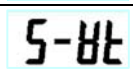
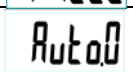
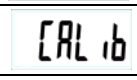
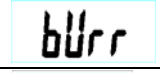
To exit the menu and to store, press the **[TARE]**-key repeatedly until “End“ appears, then confirm by pressing the **[HOLD]**-key. The balance returns automatically into weighing mode.

A selection is made by pressing the **[HOLD]**-key → and the **[TARE]**-key ↓



* default setting

8.2 Description

	Dividing steps (resolution) and weighing range (max)
	Selection multi-range scales / single range scales
	Single-range scales
	Multi-range scales
	Filter: Fast / normal / slow
	Auto Zero Tracking: 0.25d / 0.5d / 1d / 3d / OFF
	Stabilisation range: 0.25d / 0.5d / 1d / 3d / OFF
	Zero range: 2% / 100%
	Overload range: 9d / 2%
	Calibration
	Auto off: 120 sec / 180 sec / 240 sec / 300 sec / OFF
	Audible signal: ON/OFF
	Reset to default settings (default setup)
	Exit menu

8.3 Setting of maximum capacity and resolution

A selection is made by pressing the **[HOLD]**-key → and the **[TARE]**-key ↓

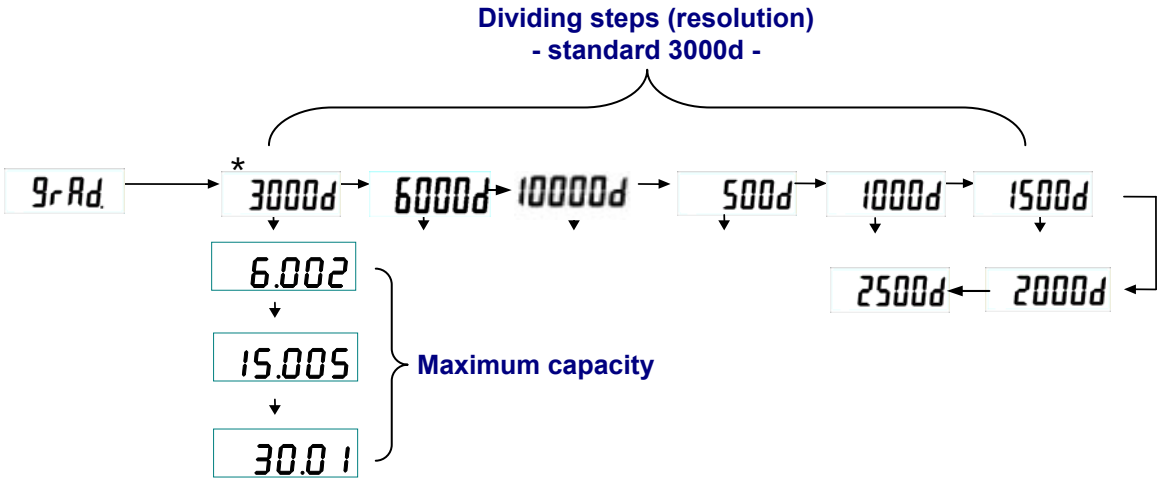
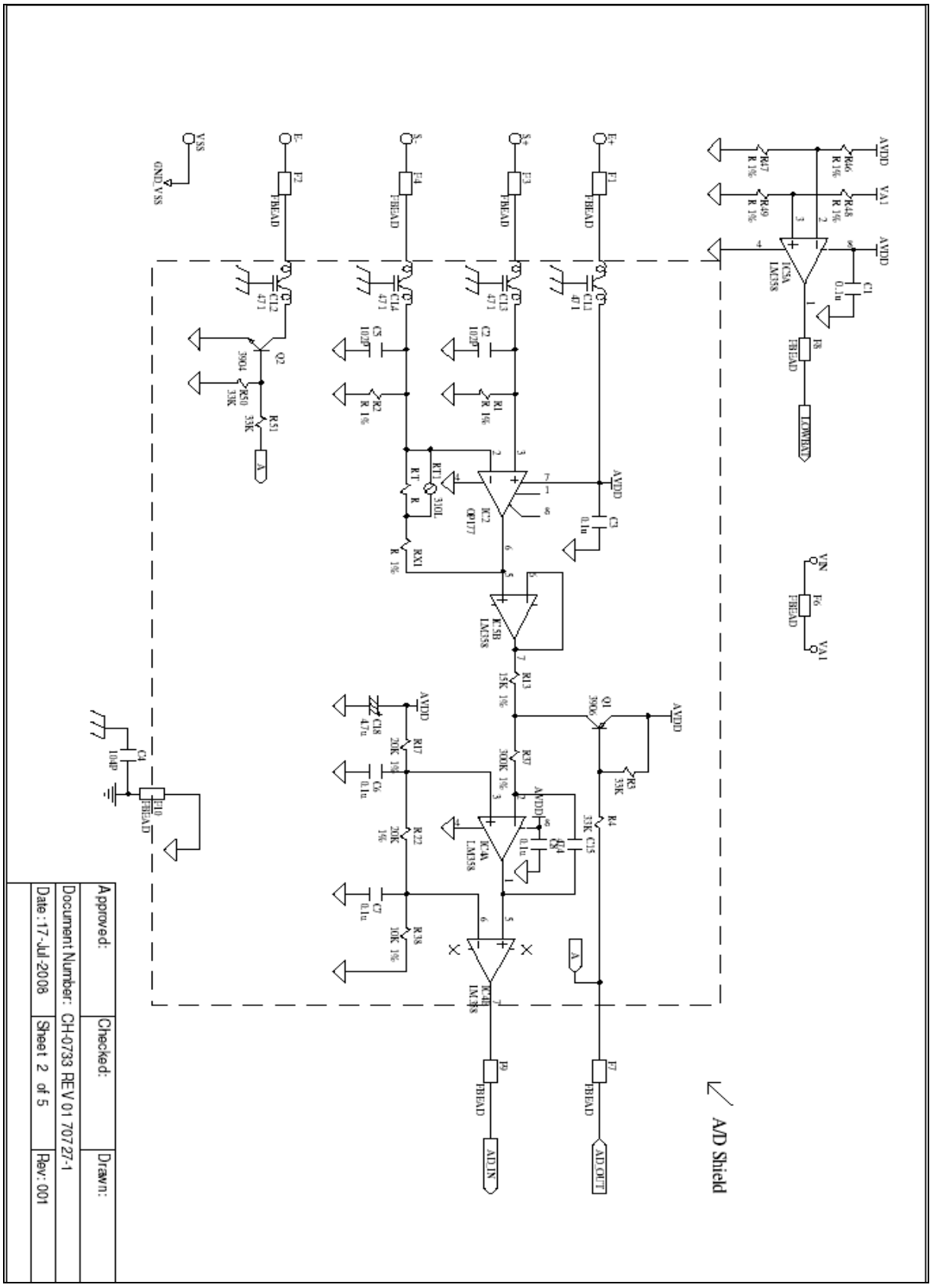


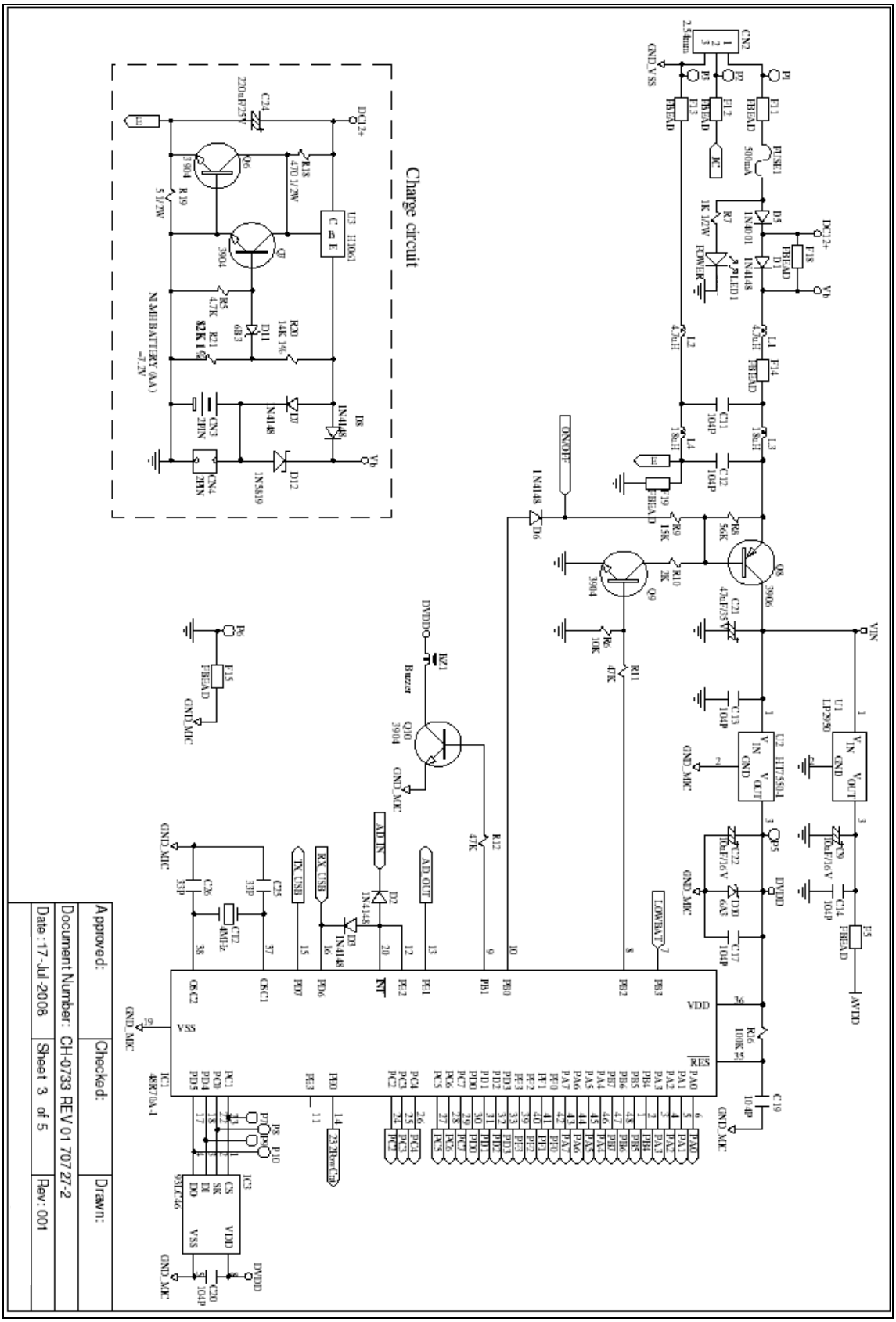
Table 1- Dividing steps

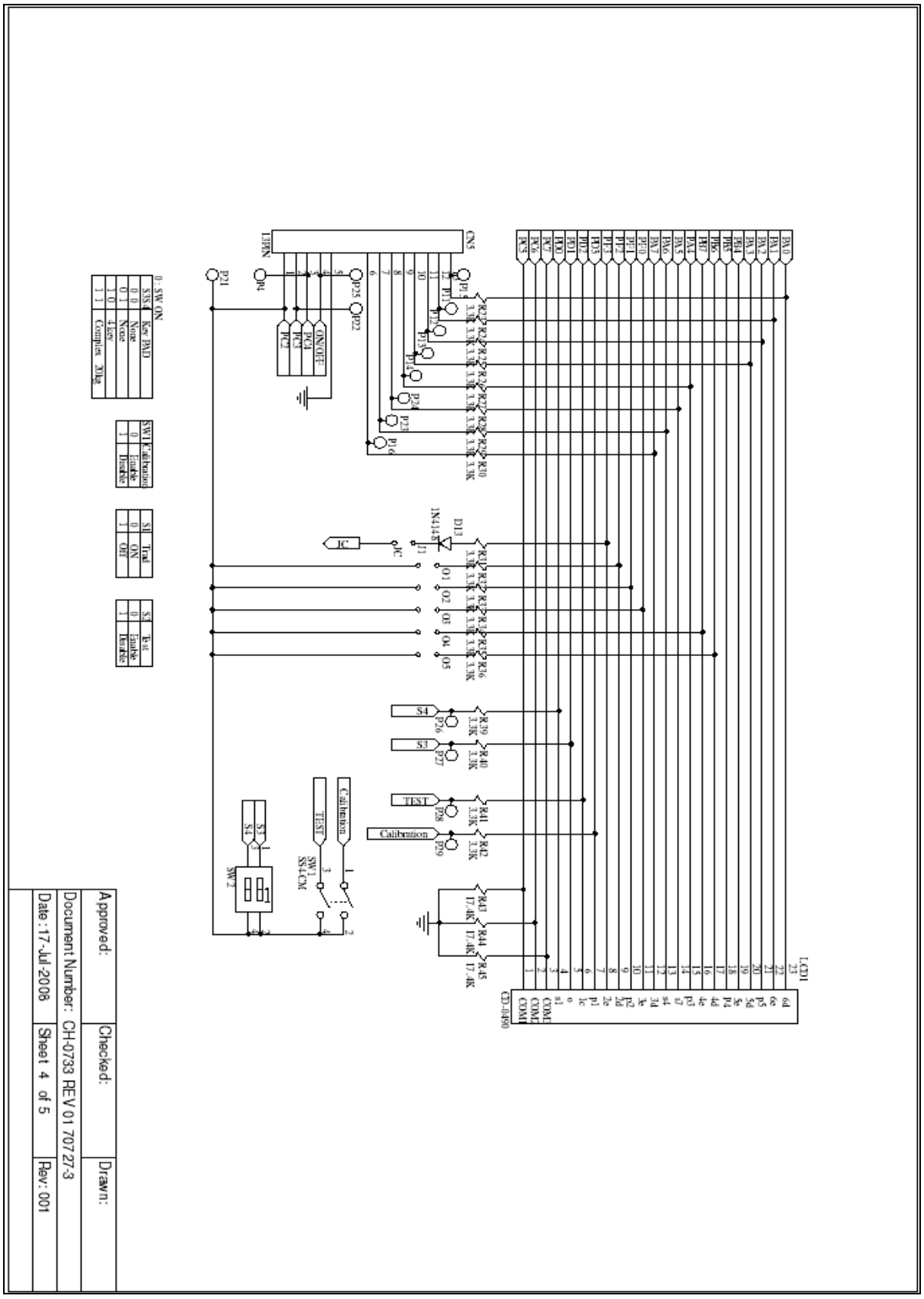
NO.	500d	1000d	1500d	2000d	2500d	3000d	6000d
1	1.002 kg	1.001 kg	1.501 kg	1.0005 kg	1.2505 kg	1.5005 kg	1.2002 kg
2	2.505 kg	2.002 kg	3.002 kg	2.001 kg	2.501 kg	3.001 kg	3.0005 kg
3	5.01 kg	5.005 kg	7.505 kg	4.002 kg	5.002 kg	6.002 kg	6.001 kg
4	10.02 kg	10.01 kg	15.01 kg	10.005 kg	12.505 kg	15.005 kg	12.002 kg
5	25.05 kg	20.02 kg	30.02 kg	20.01 kg	25.01 kg	30.01 kg	30.005 kg
6	50.1 kg	50.05 kg	75.05 kg	40.02 kg	50.02 kg	60.02 kg	60.01 kg
7	100.2 kg	100.1 kg	150.1 kg	100.05 kg	125.05 kg	150.05 kg	120.02 kg
8	250.5 kg	200.2 kg	300.2 kg	200.1 kg	250.1 kg	300.1 kg	300.05 kg
9	501 kg	500.5 kg	750.5 kg	400.2 kg	500.2 kg	600.2 kg	600.1 kg
10	1002 kg	1001 kg	1501 kg	1000.5 kg	1250.5 kg	1500.5 kg	1200.2 kg
11	2505 kg	2002 kg	3002 kg	2001 kg	2501 kg	3001 kg	3000.5 kg
12	5010 kg	5005 kg	7505 kg	4002 kg	5002 kg	6002 kg	6001 kg
13	10020 kg	10010 kg	15010 kg	10005 kg	12505 kg	15005 kg	12002 kg

9 Schematics

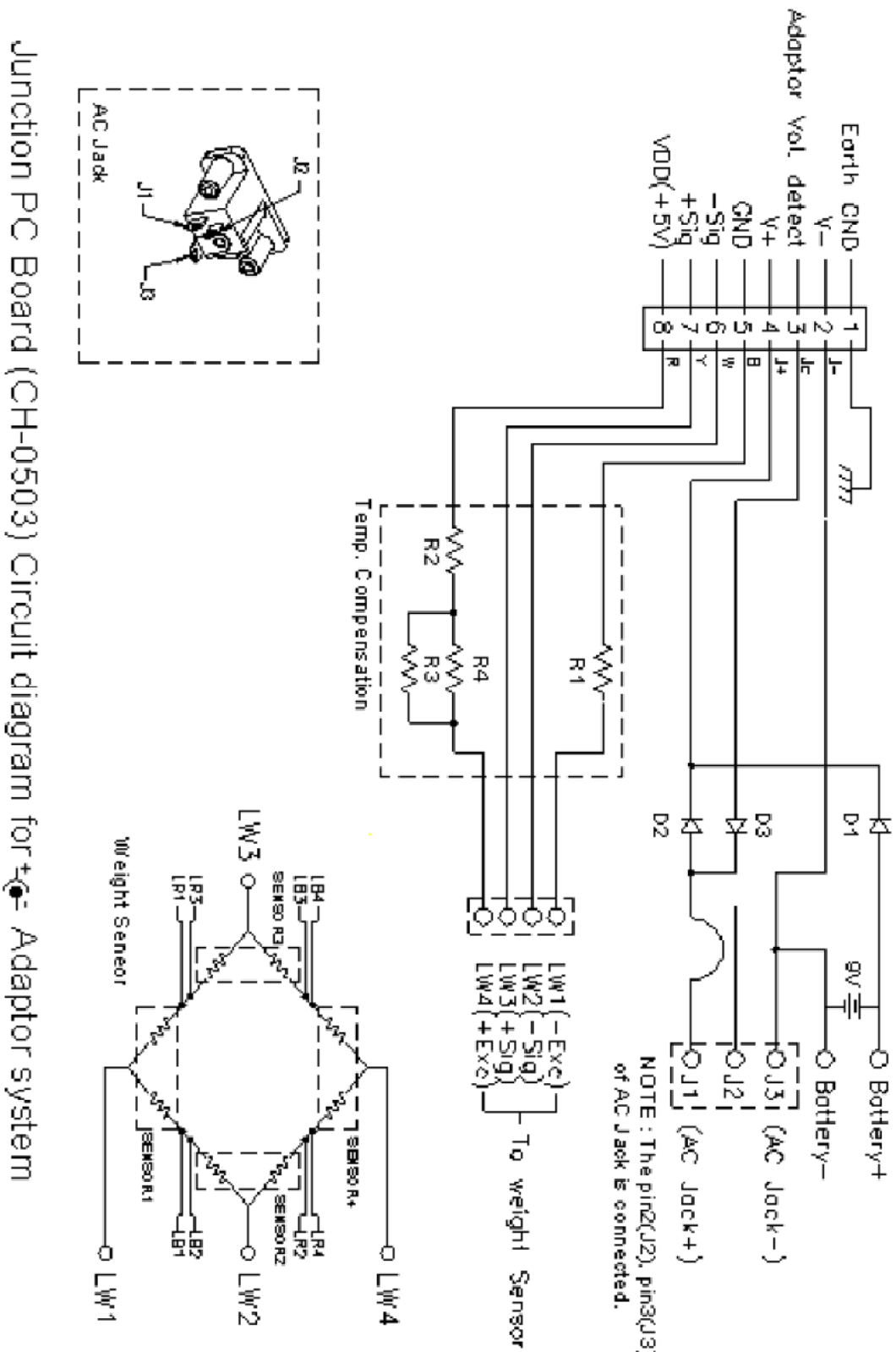
CH-0733



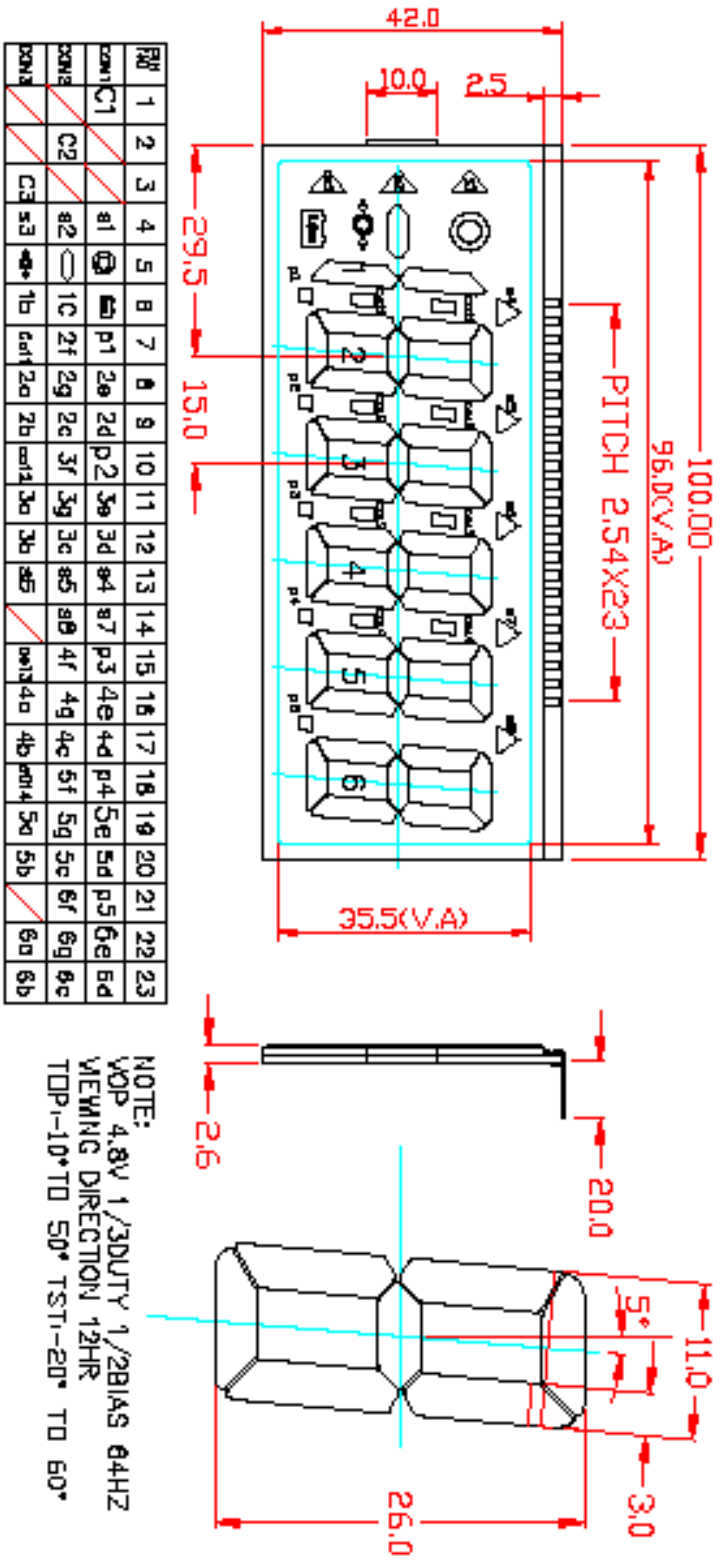

Charge circuit
NI-MH BATTERY (AA)
=7.2V
Approved:
Checked:
Drawn:
Document Number: CH-0733 REV 01 707 27-2
Date : 17-Jul-2006
Sheet 3 of 5
Rev: 001


Approved:
Checked:
Drawn:
Document Number: CH-0733 REV 01 707 27-3
Date : 17-Jul-2008
Sheet 4 of 5
Rev: 001
LCD1
CD-0490
CN5
Calibration
TEST
S4
S3
SW1
SW2
D13
1N4148
0 - SW ON
SW1 Calibration
SW2 Test
SW3 Key PAD
SW4 Esc
Complies 20kg

10 System Block Diagram



11 Display Format

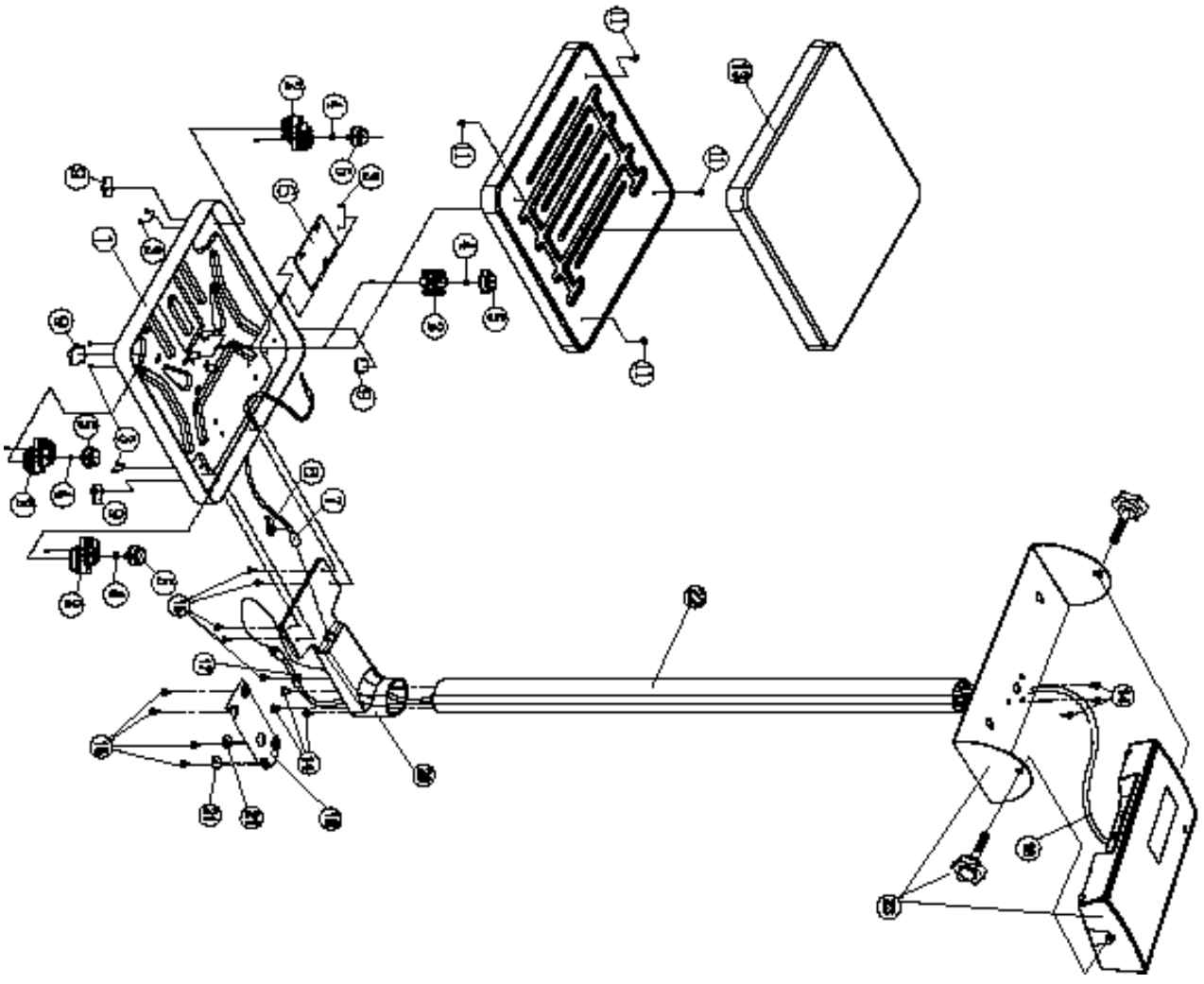


12 Assembly Drawing

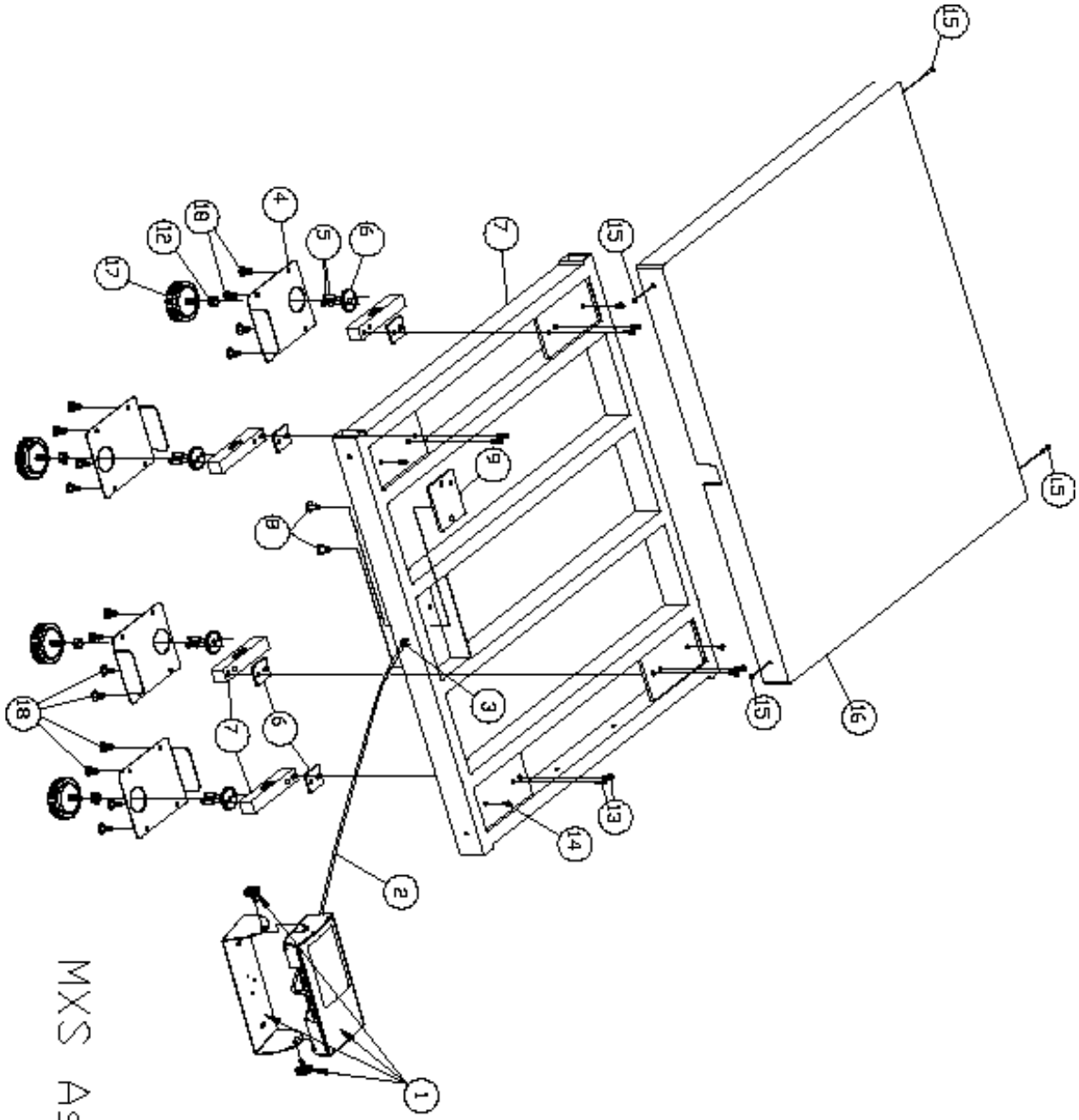
12.1 MPB 300K100 / MPB 300K100P

MPB SERIES ASSEMBLY DRAWING

NO.	ITEM	MPB	MPB P	QTY
1	Mid Stand Base	BN-0340	BN-0340	1
2	Load Cell	AL-1350	AL-1350	4
3	Screw	M5x0.5x6	M5x0.5x6	8
4	Jrgn	SS-1970	SS-1970	4
5	Sensor Cover	ST-0800	ST-0800	4
6	Junction Board	CH-0503	CH-0503	1
7	Cable	WR-8135	WR-8135	1
8	Strain Relief	SB-SM-2	SB-SM-2	1
9	Feet	SW-0090	SW-0090	4
10	Mid Stand Cover	CR-0549	CR-0549	1
11	Screw	M3x10	M3x10	4
12	Indicator	VS-2000	VS-2000	1
13	Protective cap	CR-0338	CR-0338	1
14	Screw	M4x12	M4x12	6
15	Screw	M4x10	M4x10	5
16	Cable		WR-8139	1
17	Cable Clip	PC-2L	PC-2L	1
18	Screw	M2.5 x 5	M2.5 x 5	2
19	Fixed Cover	SS-3771	SS-3771	1
20	Panel Support	SS-3731	SS-3731	1
21	Rubber Feet	SW-0071	SW-0071	2
22	Column	AN-1082	AN-1082	1
23	Indicator	VS2000	VS2000	1



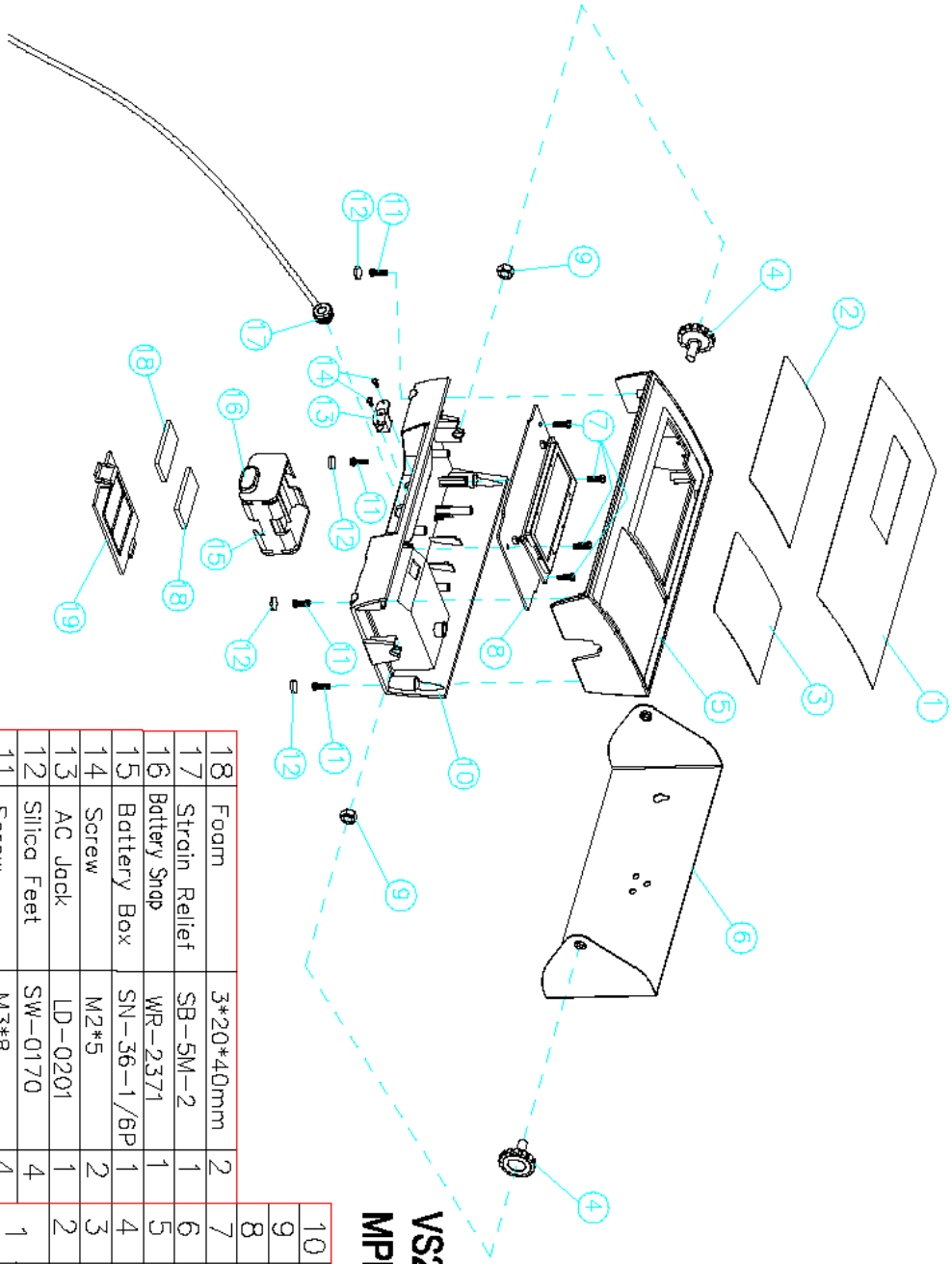
12.2 MXS 300K100



MXS Assembly Drawing

NO	Item	Spec.	QTY
1	Indicator	DP-3300	1
2	3m cable	WR-8101	1
3	Strain Relief	*SB-SM-2	1
4	Protecting Cover	SS-2020	4
5	Hexagon Screw	M4X0.7X16	8
6	Anchor Back	BP-0310	4
7	LOAD CELL	AL-1400	4
8	Washer	WH-0230	4
9	Frame	SS-2591	1
10	PCB Spacer	RBS-8	2
11	PCB	CH-0525	1
12	Nut	M8	4
13	Hexagon Screw	M6X20	8
14	Recessed Head Screw	M5X8	4
15	Recessed Head Screw(SS)	M4X10	4
16	Platfrom (SS)	CR-143A	1
17	Feet	SW-0590	4
18	Hook Up Knob	MB-17	16

12.3 Indicator



VS2000 Assembly Drawing for MPB / MXS

No.	Name	Spec.	QTY
18	Foam	3*20*40mm	2
17	Strain Relief	SB-5M-2	1
16	Battery Snap	WR-2371	1
15	Battery Box	SN-36-1/6P	1
14	Screw	M2*5	2
13	AC Jack	LD-0201	1
12	Silica Feet	SW-0170	4
11	Screw	M3*8	4

No.	Name	Spec.	QTY
10	Plastic Base	BM-8075	1
9	Nut	M6*1.0*5	2
8	PCB Module	ZLC04396KG	1
7	Screw	M3*8	4
6	Bracket	WP-8006	1
5	Plastic Top Cover	CR-8085	1
4	Screw	SW-8060	2
3	Control Panel	NP-3371	1
2	LENS	LS-8045	1
1	Panel(MXS)	NP-8341	1
	Panel(MPB)	NP-8339	1