EK-H Series

MAINTENANCE MANUAL

Compact Balances

EK-400H
EK-600H
EK-4000H
EK-6000H

1461-1A-시트 8.11.09

A&D Company, Limited

Contents

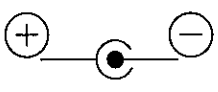
1. Introduction

This is the maintenance manual for the following balances.

EK-400H EK-600H EK-4000H EK-6000H

For smooth maintenance, the products must be technically understood, and the required equipment and tools must be prepared. The EK-H series are electronic balances using load cells as a weighing sensor. Correct to operation can not guarantee, if the maintenance is performed under unsatisfactory conditions.

1.1 Equipment and Tools Required

Description		Purpose
Phillips screwdriver 3 mm		For disassembly and reassembly
Stopper spacer tool (Thickness gauge)		0.5mm $^{+0.1mm}_{-0.0mm}$ for EH-400H, 600H 1.4mm $^{+0.1mm}_{-0.0mm}$ for EH-4000H, 6000H
Adhesive tape 8 mm		For cleaning
Allen wrench, 3 mm		For load cell unit repair
Soldering iron (25-40 W)		For soldering
Weights	EK-400H	Two 200g, Two 300g or Two 200g, Two 100g
	EK-600H	One 200g, Two 300g or Two 200g, Two 100g
	EK-4000H	Two 2kg, Two 3kg or Two 2kg, Two 1kg
	EK-6000H	One 2kg, Two 3kg or Two 2kg, Two 1kg
AC adapter		Confirm that the AC adapter type is correct for your local voltage and receptacle type (mains voltage and socket). The adapter will be dependent on the area of use. AC adapter plug :  Input DC15V 80mA
Multimeter		
Oscilloscope		
Temperature Controlled Room		A room where the temperature can be maintained at 10 ±3°C and 30 ±3°C for 4 hours or more.

1.2 Corrective Maintenance Outline

Test to locate defects	To perform the corrective maintenance, defects must be located and their cause determined. The easiest ways to locate a defect is to perform an operation check replacing suspected components.
Corrective maintenance procedure	Corrective maintenance is described by using a flow-chart and a trouble-shooting table.
Adjustment details	An adjustment procedure is described that covers all units.

2. Performance Test

If the slide switch SW6 on the power supply board 7PZ:3119 is installed and when it is turned on (to upper side), EK-H balances can not calibrate. Turn off the slide switch (to lower side) for the maintenance.
Allow five minutes warm-up prior to conducting the performance test.

2.1 Performance Test Procedure

Verify the following points:

- ❑ External view (is the unit properly assembled and clean)
- ❑ The air bubble is in the middle of the bubble spirit level.
- ❑ The pan is level. (check for correct assembly)
- ❑ Verify that each key functions correctly:
  ON/OFF key
  PRINT key
  SAMPLE key
  MODE key
  ZERO key
- ❑ Verify that the following function correctly:
  The minus indicators
  The decimal point indicators
  That a stable display is obtained.
  Selection of the weighing units.
  The interface options
  Battery option
- ❑ Verify that the TAEL value :

Kind of tael	Symbol	Weight (g/ tael)
Hong Kong (jewelry)	TN	37.4290g
Hong Kong (general, Singapore)	TG	37.7994g
Taiwan	TT	37.5000g

2.2 Test Details for Initial Condition Check

Repeatability

Step 1 Use normal weighing mode for initial condition check.
Exercise the balance (for load cell) by applying a load of maximum load 3 times, returning to minimum load after each load application.

Step 2 Calibrate the balance and perform the following procedure continuously.

Step 3 Put nothing on the pan and make zero display using the RE-ZERO key.

Step 4 Record displayed value of zero point.

Step 5 Put the specified weight on the pan and record displayed value of full-scale.

Step 6 Calculate a span value that subtracted zero point value form full-scale and remove the specified weight from the pan.

Step 7 Repeat from step 4 to step 6 for 10 times.

Step 8 Calculate the standard deviation "σ" from these tests.

The difference between the values of all ten tests and the true value must be within the specifications. "σ" is the standard deviation.

Products	Weights	Times	Zero tolerance	Span tolerance
EK-400H	400g	10	Max. - Min. ≤ 2 digits	σ ≤ 1 digit
EK-600H	500g			
EK-4000H	4kg			
EK-6000H	5kg			

Corner load error

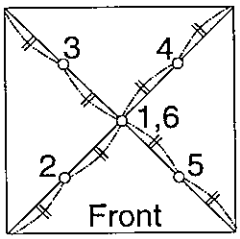
Step 1 Use normal weighing mode for initial condition check.
Exercise the balance (for load cell) by applying a load of maximum load 3 times, returning to minimum load after each load application.

Step 2 Put the specified weight at the center of the pan (point 1) and record the displayed value.

Step 3 Put the same weight, at position 2, 3, 4, 5 then 6. Record each value.

Step 4 Check the difference between the value at the center and the four marks (these marks are half the distance from the center of the pan to the corner).

Products	Weights	Tolerance
EK-400H	200g	Difference between point 1 and other points ≤ ±2 digits
EK-600H	200g	
EK-4000H	2kg	
EK-6000H	2kg	



Linearity/ Hysteresis

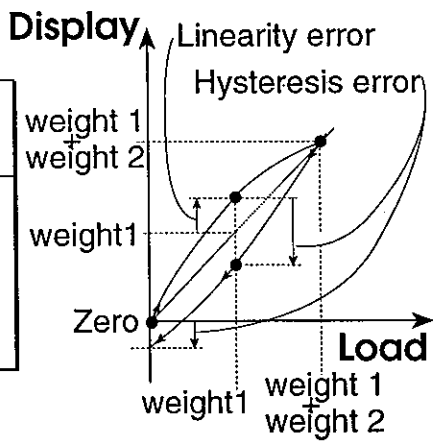
Step 1 Use normal weighing mode for initial condition check.
Exercise the balance (for load cell) by applying a load of maximum load 3 times, returning to minimum load after each load application.

Step 2 Calibrate the balance and perform the following test continuously.

Step 3 Put weight 1 on the pan and sequentially add weight 2, as specified in the table below. Record these displayed value.

Step 4 Remove weight and record each displayed value. Check the error each time when you add or remove a weight.

Products	Weights	Linearity tolerance	Hysteresis tolerance
EK-400H	200g x 2	≤ ±2 digits	≤ ±3 digits
EK-600H	300g x 2		
EK-4000H	2kg x 2		
EK-6000H	3kg x 2		



Creep

Step 1 Use normal weighing mode for initial condition check.
Warm up the balance for at least five minutes. Put nothing on the pan.

Step 2 Record a zero point value.

Step 3 Place the weight on the pan for one minute and record first displayed value and last it.

Step 4 Remove the weight and record the display for zero hysteresis.

Step 5 Check the difference between the first display and the last it for creep.

Products	Weights	Time	Creep	Zero hysteresis
EK-400H	400g	60 sec.	Difference between the first display and the last display ≤ ±2 digits	≤ ±2 digits
EK-600H	600g			
EK-4000H	4kg			
EK-6000H	6kg			

3. Corrective Maintenance

3.1 Corrective Maintenance Flow Chart

Perform corrective maintenance for the EK-H series by referring to the maintenance flowchart and the troubleshooting table. The troubleshooting table describes the possible cause and solution to facilitate corrective maintenance. The maintenance flowchart describes what you must do if anything has been replaced or adjusted.

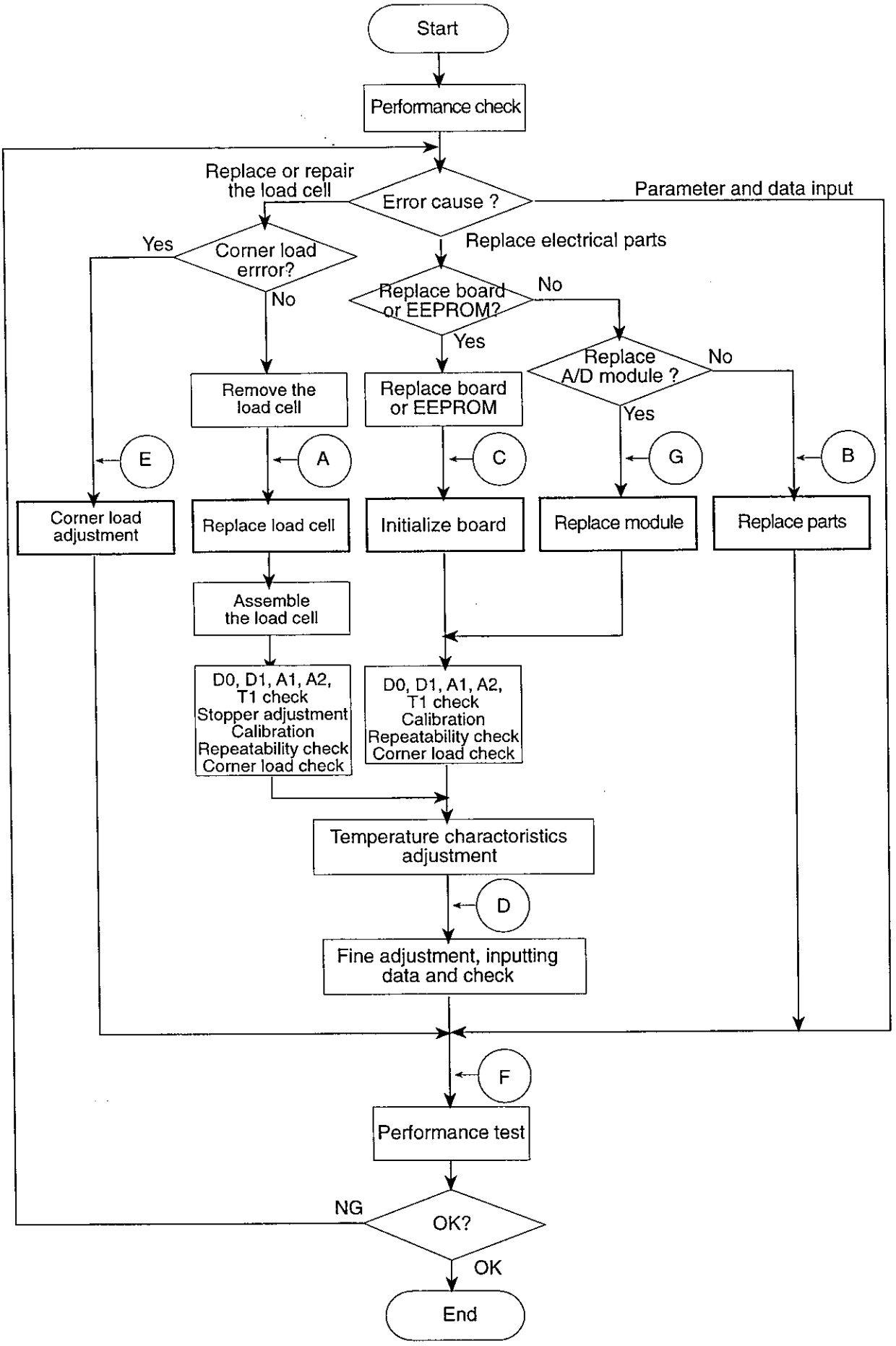
Maintenance Flow Chart and Nodes

Perform corrective maintenance according to the maintenance flow chart. Start repair form a corresponding node.

Type A: Replacing, disassembling, or assembling mechanical unit.
Type B: Replacing or adjusting electrical parts.
Type C: Initializing main board and inputting characteristic data.
Type D: Adjusting the characteristics of the mechanical unit.
Type E: Adjusting corner load error
Type F: Performing tests.
Type G: Replacing a A/D module.

Troubleshooting Table

The following troubleshooting table describes the (principal) possible cause and the solution to problems. Nodes indicate points jumping on the maintenance flow chart. Repair the balance form the node on the chart.


Start
Performance check
Replace or repair the load cell
Error cause ?
Parameter and data input
Yes
Corner load errror?
No
Replace electrical parts
Replace board or EEPROM?
No
Yes
Replace A/D module ?
No
Yes
Remove the load cell
Replace board or EEPROM
E
A
C
G
B
Corner load adjustment
Replace load cell
Initialize board
Replace module
Replace parts
Assemble the load cell
D0, D1, A1, A2, T1 check Stopper adjustment Calibration Repeatability check Corner load check
D0, D1, A1, A2, T1 check Calibration Repeatability check Corner load check
Temperature charactoristics adjustment
D
Fine adjustment, inputting data and check
F
Performance test
NG
OK?
OK
End

3.2 Troubleshooting and Error Code Table

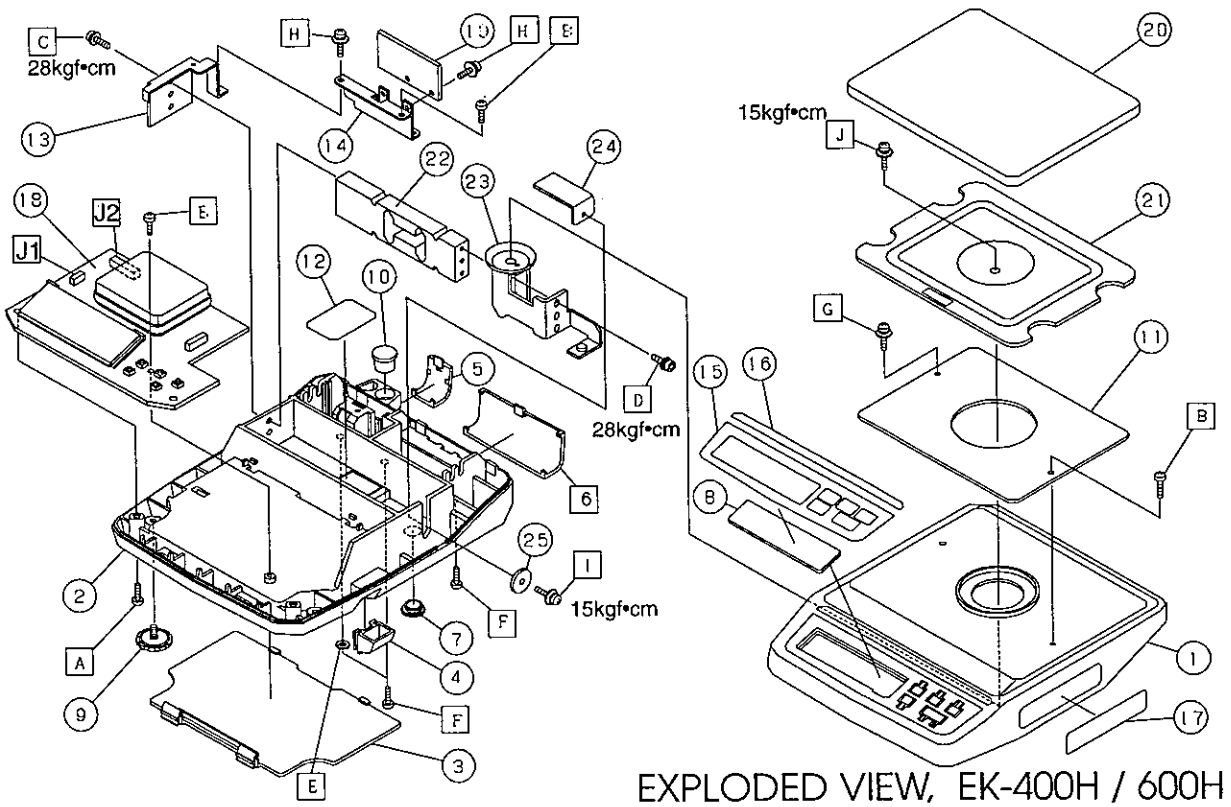
Problem	Location/ Check	Solution	Type
Key operation error	Key switch on the main board and key top of the upper case. Check key actions.	Replace the key or upper case.	B
No display	Check soldered pins of CPU. Key operation of ON/OFF key. Check power supply of AC adapter connection or battery.	Repair soldered pins of CPU. Replace the battery, AC adapter jack or AC adapter.	B
E -E	Check the pan is not touch to case.	Set the pan rightly.	F
	Check the D0 for the condition of a main board and a load cell that is within 2600±500 digits at zero weighing.	Calibrate the balance, if D1 and D0 are normal.	D
		Replace A/D module, if D1 is error.	G
	Check the D1 for load cell that is within 66000±6000 digits at a input short mode#1.	Replace the load cell, if D1 is normal and D0 is error.	A
Unstable weighing	Check the difference A1 between max. and min. of D1 that is within 7 digits per five seconds.	Replace the A/D module, if drift A2 is bigger than 4 digits.	G
	Check the difference A2 between max. and min. of D1 that is within 4 digits per five seconds at a input short mode#1.	Replace the load cell, if drift A2 is small and drift A1 is bigger than 7 digits.	A
	Check the difference between max. and min. of T1 that is within 10 digits per five seconds.	Replace the A/D module or the load cell, if T1 drift is bigger than 10 digits per five seconds.	G
Weighing value error Zero error	Check stopper.	Adjust stopper.	D
		Calibrate the balance.	F
Linearity error	Check linearity data. A/D module	Input linearity data.	F
		Replace the load cell.	A
		Replace A/D module.	G
Creep error	Load cell	Input creep data.	F
		Replace the load cell.	A
Four corner error	Load cell	Adjust corner load error.	E
		Replace the load cell.	A
Repeatability error	Load cell, A/D module.	See "Unstable weighing".	-

Problem	Location/ Check	Solution	Type
Error 0	T1 data is unstable.	Check load cell cable and connector.	F
		Replace A/D module.	G
		Replace temp. sensor.	C
Error 1	Unstable at turning on the power, calibrating the balance or making re-zero.	See "Unstable weighing".	-
Error 3	EEROM I/O error.	Check or replace the CPU and U3.	B
Error 4	RAM error	Replace the CPU.	B
Error 8	Compatibility error for CPU and EEROM.	Press the PRINT key.	C
Error 9	Initial process error of EEROM.	Pressing and holding the ZERO key and MODE key, press the PRINT key.	C
Error A	Compatibility error for CPU and EEROM.	Pressing and holding the ZERO key and MODE key, press the PRINT key.	C
CAL E	The weight is too heavy. Check D0 value.	Check Calibration weight.	F
		Replace A/D module.	G
		Replace load cell.	A
-CAL E	The weight is too light. Check D0 value.	Check Calibration weight.	F
		Replace A/D module.	G
		Replace load cell.	A
Unable to enter to calibration mode	Check the slide switch SW6	Turn off the SW6 (downward)	F

#1: Input short mode. See section "Measurement display d-dSP" of 5.2 check mode.

4. Disassembly & Reassembly

This explanation use a EK-400H. Refer section "8. Exploded views" and "9. Parts List" for parts name.



EXPLODED VIEW, EK-400H / 600H

4.1 Disassembly

Step 1 Remove the pan and remove pan support with a screw J.

Step 2 Remove a screw G ,two tapping screws A and remove the upper case.

Step 3 Remove these cable of connector J2, J1 on the main board, screw B and option. Main board can be removed.

Step 4 Remove screw F and H. The power supply board can be removed.

Step 5 Remove three screws C. The load cell can be removed.

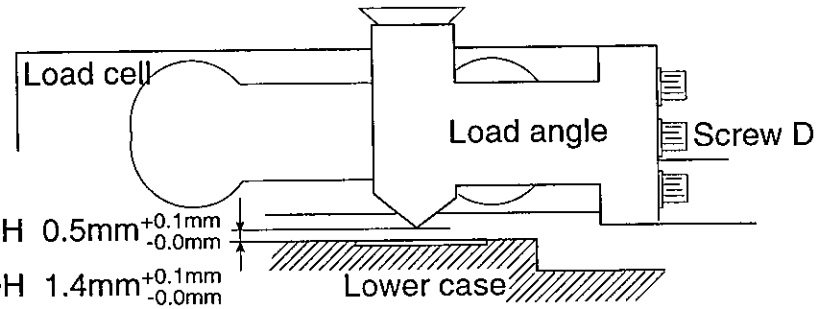
Step 6 Remove three screws D. The load angle can be removed.

4.2 Assembly

Step 1 Attach the load angle to load cell with three screws D (M4x10) gently and loosely.

Step 2 Attach the load cell and load cell support to the lower case with three screws D (M4x12). This torque is 28kgf•cm.

Step 3 Adjust the space, is called "stopper space", between load angle and lower case as shown this drawing using the thickness gauge. Screw up these screw D at 28kgf•cm torque.



EH-400H, 600H 0.5mm $^{+0.1mm}_{-0.0mm}$

EH-4000H, 6000H 1.4mm $^{+0.1mm}_{-0.0mm}$

Step 4 Attach the upper stopper and stopper support to lower case for EK-400H and EK-600H with a screw I. This torque is 15kgf•cm.

Step 5 Place the power supply board. Screw up screw F, B and H.

Step 6 Place the main board at the right position.

Step 7 Connect a load cell cable to J2 and power line cable to J11 form the power supply board. Arrange cable line to avoid a touching load cell

Step 8 Close the upper case with screw A and G.

Step 9 Fix the pan support with a screw J. This torque is as shown below :

EK-400H and 600H	15kgf•cm
EK-4000H and 6000H	22kgf•cm

Step 10 Place the pan.

5. Adjustments

5.1 Adjustment Specifications

Item	EK-400H	EK-600H	EK-4000H	EK-6000H
Total condition test				
Zero at D0 display	2600±500 digits			
Span at D0 display	4400±400 digits		8300±800 digits	
Max. - Min. of drift A1 at D1 display	A1 ≤ 7 digit/5 sec.			
Test weight	600g		6kg	
Main board test on the input short mode				
Display	66000±6000 digits			
Max. - Min. of drift A2 at D1 display	A2 ≤ 4 digit/5 sec.			
Temperature A/D test				
T1 display	290000±30000 digits			
Max. - Min. of T1 display	T1 ≤ 10 digit/5 sec.			
Repeatability using D2 display				
Max. - Min. of zero display	≤ 10 digit/5 times		≤ 2 digit/5 times	
Max. - min. of span display	≤ 3 digit/5 times		≤ 2 digit/5 times	
Test weight	500g		5kg	
Corner load test using D2 display				
Difference between center and others	±2 digits			
Test weight	200g		2kg	
Temperature test using D2 display, High temp. = 30±3°C, Low temp. = 10±3°C, Δt = 20±2°C, To maintain each temperature, for more than 4 hours.				
Variance of zero display	Within ±30 digits			
Variance of span display	Within ±5 digits			
Test weight	500g		5kg	
Creep test using D2 display				
During load	Within ±2 digits/1 minute			
Returning to zero	Within ±2 digits			
Test weight	500g		5kg	
Calibration error using D2 display	Within ±1 digit			
Test weight	500g		5kg	
Linearity error using D2 display	Within ±2 digits			
Test weight	300g x 2		3kg x 2	
Hysteresis error using D2 display	Within ±3 digits			
Test weight	300g x 2		3kg x 2	
Low battery display on d-dSP	Normal power line voltage = 140±5			

5.2 Flow and Priority of Adjustment

This is a complete adjustment procedure for the EK-H series. Use a specified main board and a load cell.

Primary check

Step 1 The check of A/D operation. (The check of D0 value, D1 drift and T1 value)

Step 2 The stopper space adjustment.

Step 3 Calibration.

Step 4 The repeatability check.

Step 5 The corner load adjustment. (for four corner error)

Step 6 The temperature compensation adjustment.

Fine Adjustment

Step 7 The corner load check.

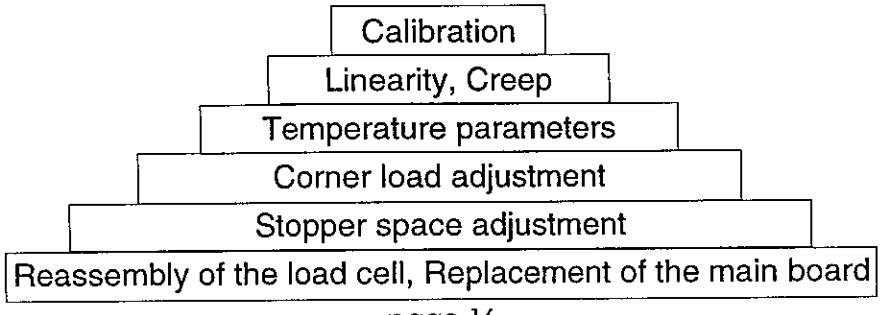
Step 8 The creep data input.

Step 9 The linearity data adjustment.

Step 10 Check for serial interface option parameters.

Step 11 Check for the protection parameters.

The structure below shows the priority for entering parameters. Functions listed nearer to the bottom are more basic. If a parameter at the bottom is adjusted, all parameters listed above it must also be adjusted.



5.2 Check Mode

Check mode has three mode of adjustment mode, function mode, basic mode.

Caution

- **Do not enter sub- modes that described "No use". Parameters can not revert and the balance may not work correctly, if it is changed in the mode.**
- **If the slide switch SW6 on the power supply board 7PZ:3119 is installed and when it is turned on (to upper side), EK-H balances can not calibrate. Turn off the slide switch (to lower side) for the maintenance.**

Entering check mode

Step 1. Turn off the display.

Step 2. Press and hold the ZERO key and MODE keys and press the ON/OFF key.
Release the MODE and ON/OFF keys while still holding the ZERO key.
Press the MODE key twice.
When this process is made within 2 seconds, the check mode is started.

Step 3. The balance will display the ROM version, product name and all segments.

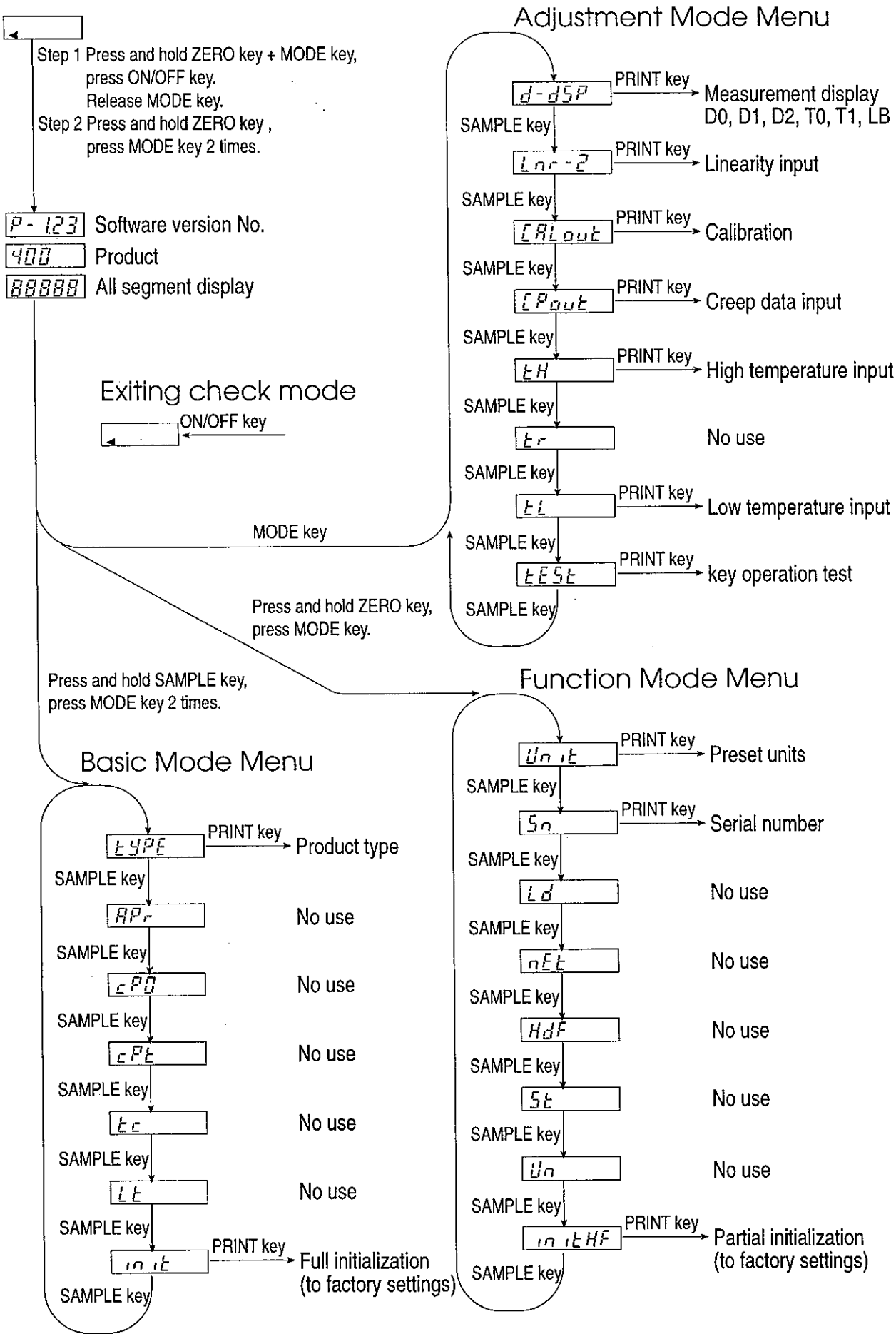
Exiting check mode

Step 1. Press the ON/OFF key when the check mode menu is displayed.

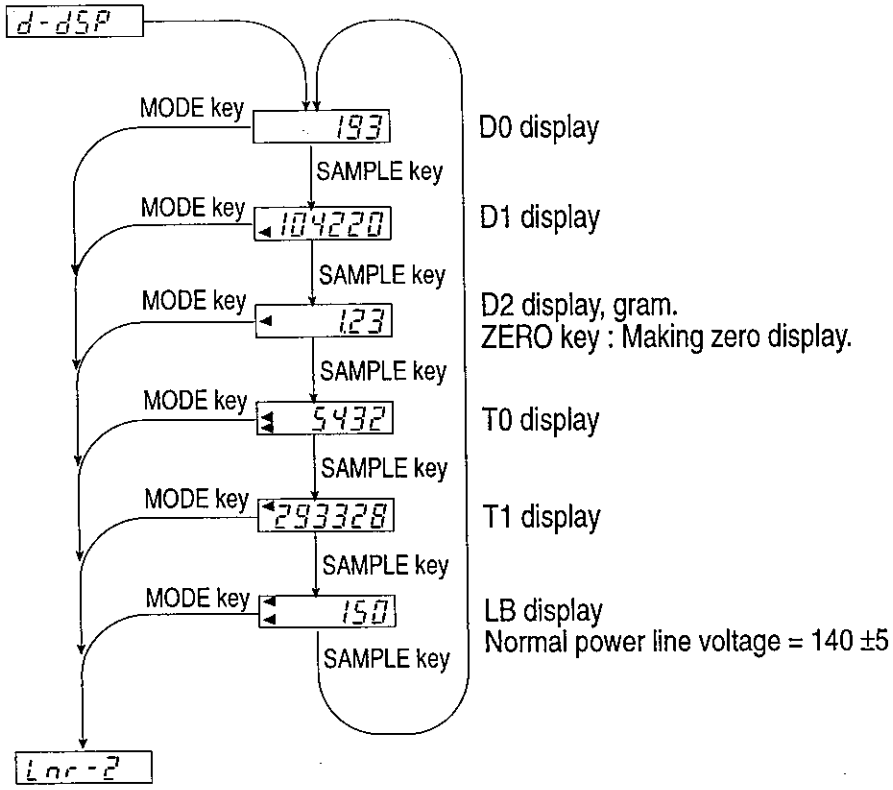
Principle key functions

ON/OFF key	Turning on or off the display.
SAMPLE key	Selecting a item or changing a target digit (a figure).
ZERO key	Changing the parameter.
PRINT key	Entering the parameter and proceeding next step.
MODE key	Cancel key.

Check mode menu



Measurement display, d-dSP



Input short mode at Measurement display, d-dSP

This mode is used for main board test during D0, D1, T0, T1, LB display on d-dSP, It shorts the load cell input (cancels load cell input).

Key Operation

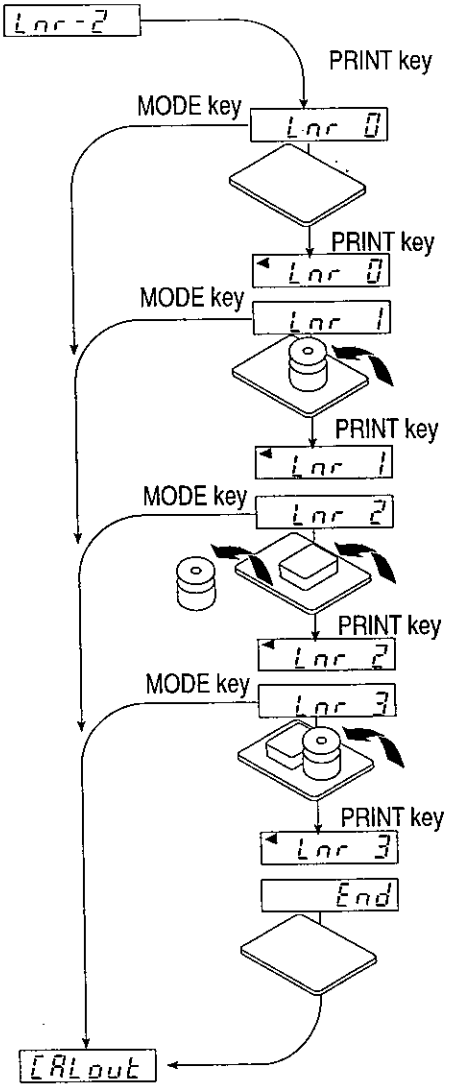
Step 1 Enter to measurement display mode (d-dSP) of check mode. (Measurement display mode is D0, D1, T0, T1 or LB display.)

Step 2 Press and hold the PRINT key, press the SAMPLE key. The load cell input is shorted and the mark "*" will display.

Step 3 Press and hold the PRINT key, press the SAMPLE key. The load cell input is reverted to normal and the mark "*" will disappear. The balance will return to normal d-dSP display.

This function can turn on/ off alternately using the same key operation.

Linearity input, Lnr-2



Put nothing on the pan.

Weighing zero

Put weight A on the pan.

Weighing A

Remove weight A and put weight B on the pan.

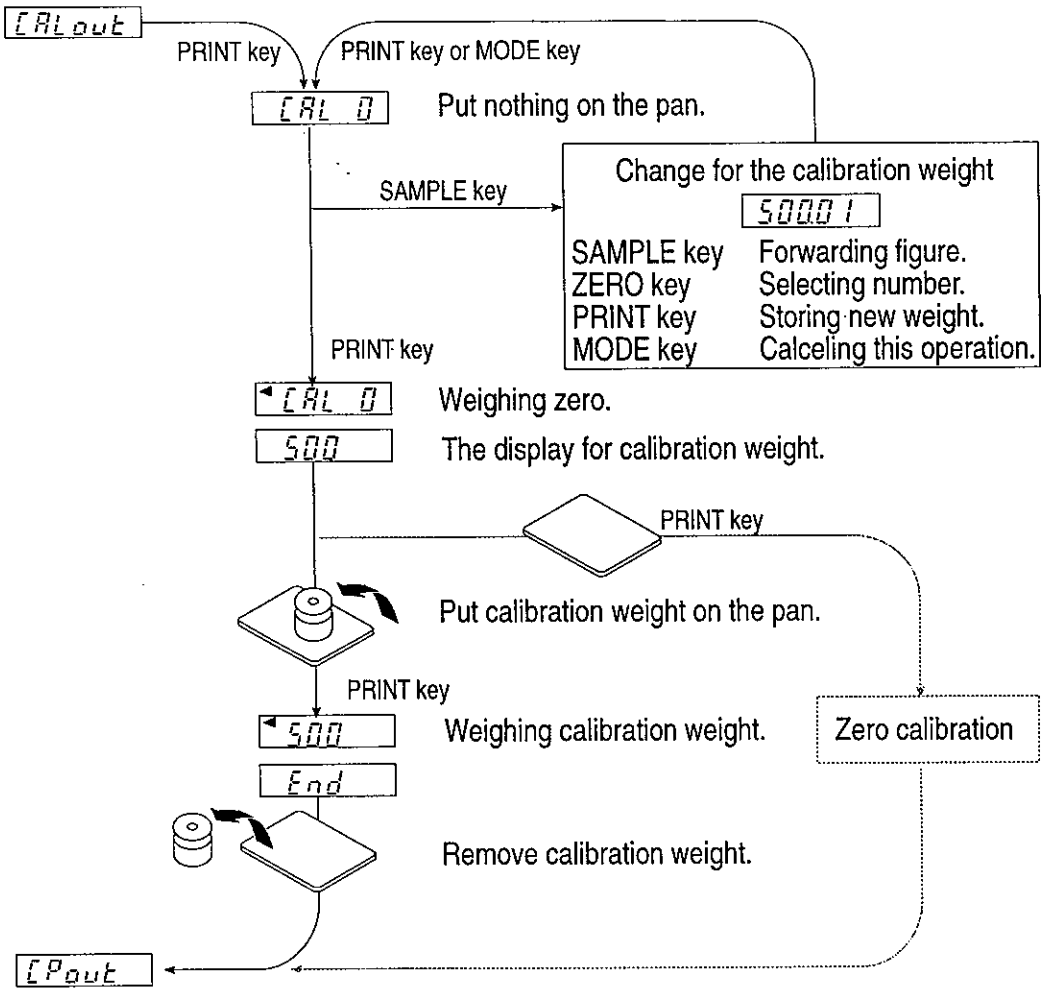
Weighing B

Put weight A, B on the pan.

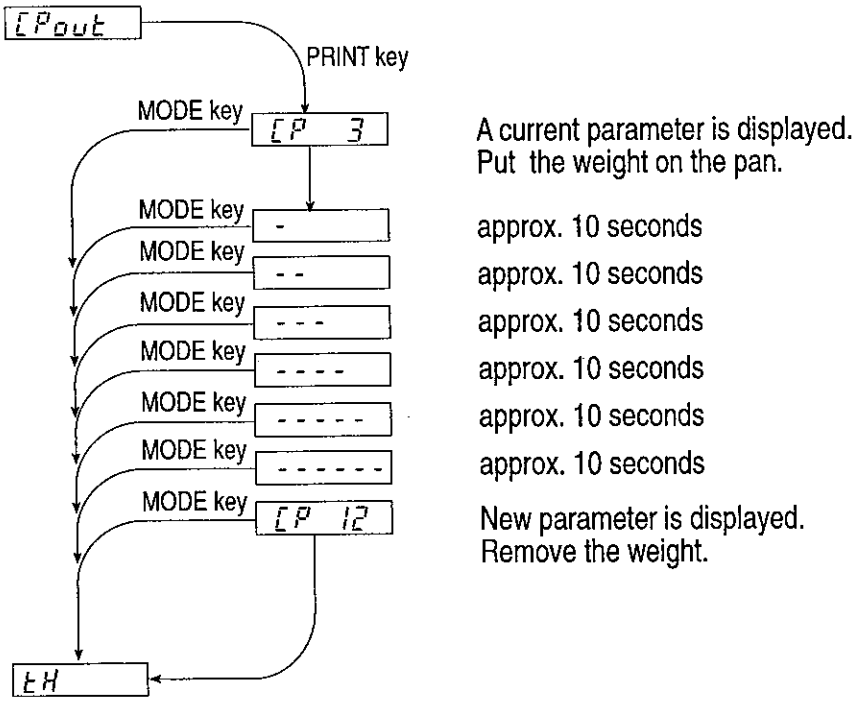
Weighing weight A, B

Remove weight A,B

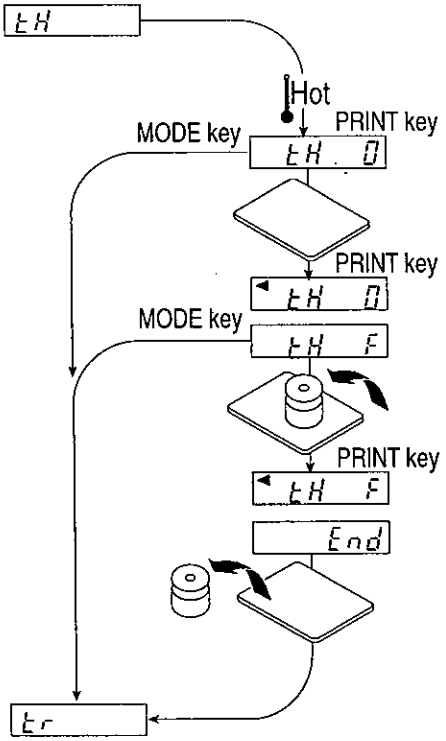
Calibration, CALout



Creep data input, CPout



High temperature input, tH



Put nothing on the pan.

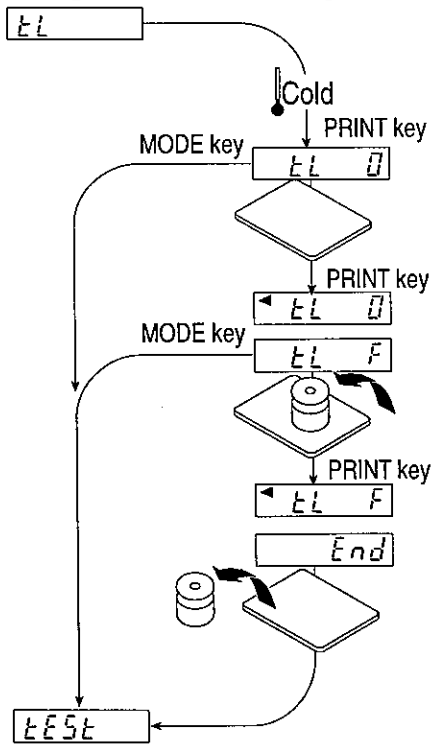
Weighing zero.

Put the weight on the pan.

Weighing full scale.

Remove weight.

Low temperature input, tL



Put nothing on the pan.

Weighing zero.

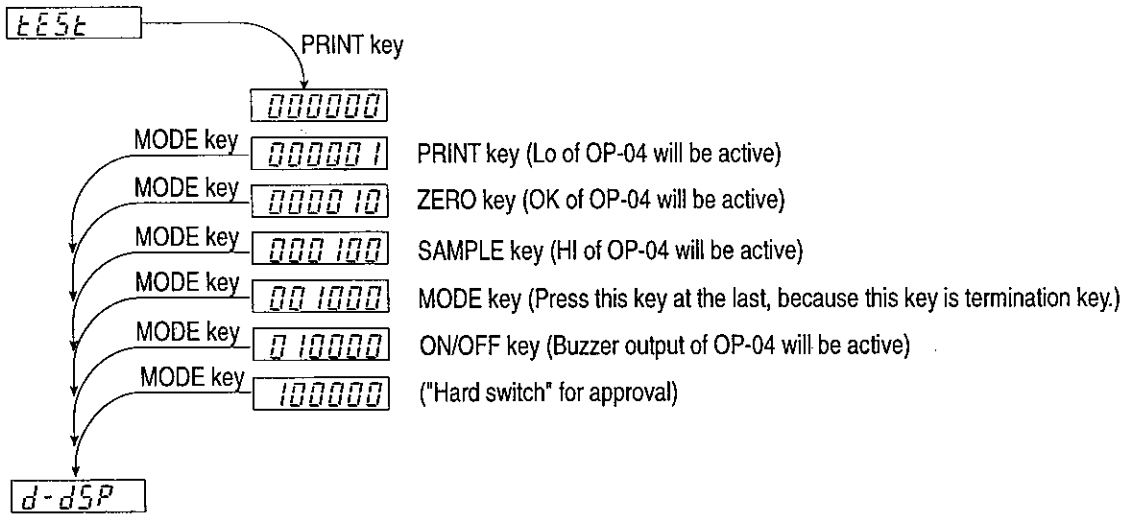
Put the weight on the pan.

Weighing full scale.

Remove weight.

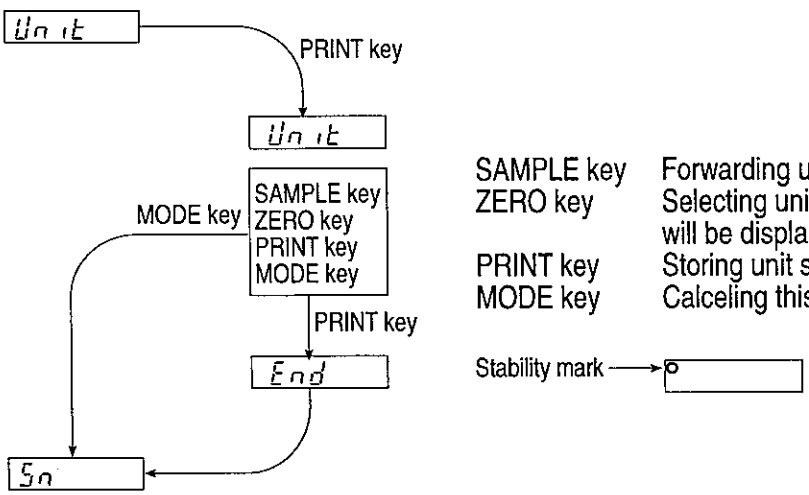
Caution **Weight uses for the temperature compensation adjustment (High temperature input and Low temperature input) should be kept in the same area throughout these adjustments.**

Key operation and I/O test, tESt



Preset units, Unit

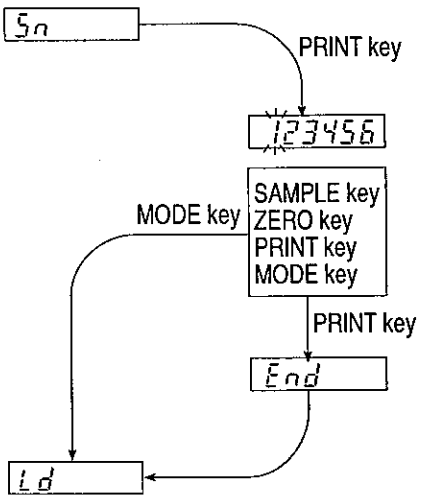
Selected units can use on normal weighing.



SAMPLE key	Forwarding units.
ZERO key	Selecting units to use. The stability mark will be displayed with selected unit.
PRINT key	Storing unit selection.
MODE key	Calceling this operation.

Stability mark →

Serial number, Sn

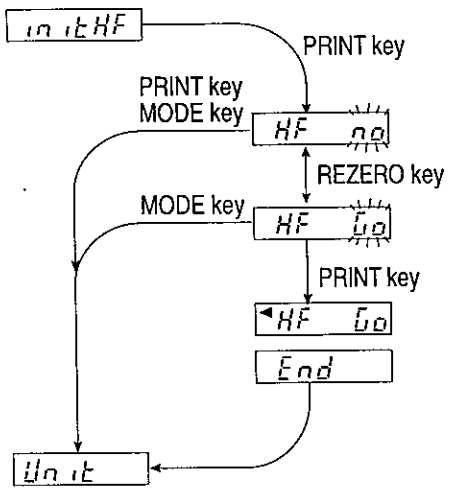


SAMPLE key	Forwarding figure.
ZERO key	Selecting character. Selectable characters are 0~9, -, space, A~Z.
PRINT key	Storing new serial number.
MODE key	Calceling this operation.

Partial initialization, InitHF

This initialization resets the following parameters to factory settings. These parameter settings can update the following site of software.

Reset parameters	Site for update
Prohibition settings.	Permission and prohibition for Calibration and function settings.
Parameter settings.	Function settings
Unit weight of counting scale and 100% weight of percent weighing.	Counting mode or percent mode.
Calibration weight value.	Calibration
Calibration parameters. (Calibration weight range, etc.)	
A selection of "Start" and "End'.	The PRINT key operation on GLP using RS-232C output.

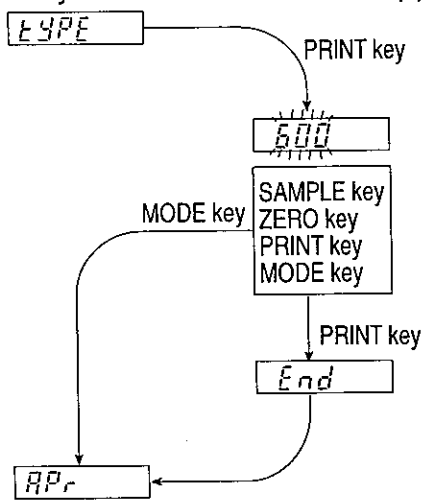


ZERO key	Selecting an action.
PRINT key	Performing an action.
MODE key	Calceling this operation.

Proceeding the half-initialization.

Product type, tYPE

Only maintenance board supplied can enter in this mode.

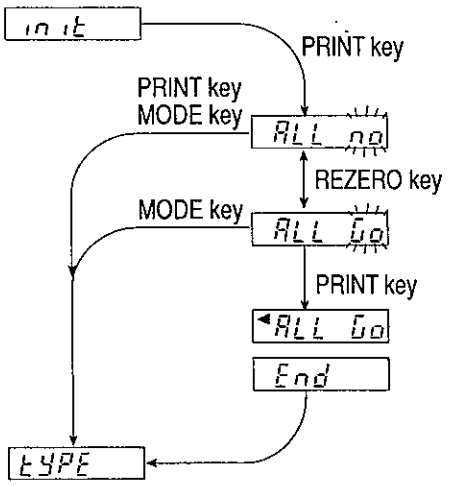


SAMPLE key	Selecting a product.
ZERO key	Selecting a product.
PRINT key	Storing new product.
MODE key	Calceling this operation.

Product type	Display
EK-600H	600
EK-400H	400
no use	200
EK-6000H	6000
EK-4000H	4000
no use	2000

Full initialization, init

It must set all parameters after this initialization is performed.



ZERO key	Selecting an action.
PRINT key	Performing an action.
MODE key	Calceling this operation.

Proceeding the initialization.

5.3 Corner load adjustment

Weighing the corner load

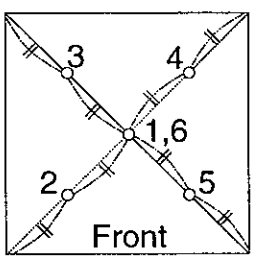
Step 1 Use normal weighing mode for initial condition check.
Exercise the balance (for load cell) by applying a load of maximum load 3 times, returning to minimum load after each load application.

Step 2 Put the specified weight at the center of the pan (point 1) and record the displayed value.

Step 3 Put the same weight, at position 2, 3, 4, 5 then 6. Record each value.

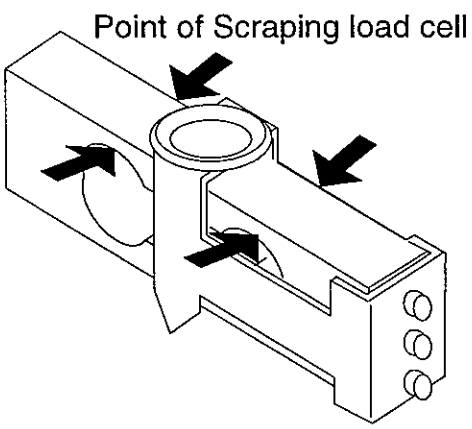
Step 4 Check the difference between the value at the center and the four marks (these marks are half the distance from the center of the pan to the corner).

Products	Weights	Tolerance
EK-400H	200g	Difference among four points ≤ ±2 digits
EK-600H	200g	
EK-4000H	2kg	
EK-6000H	2kg	



Scraping load cell

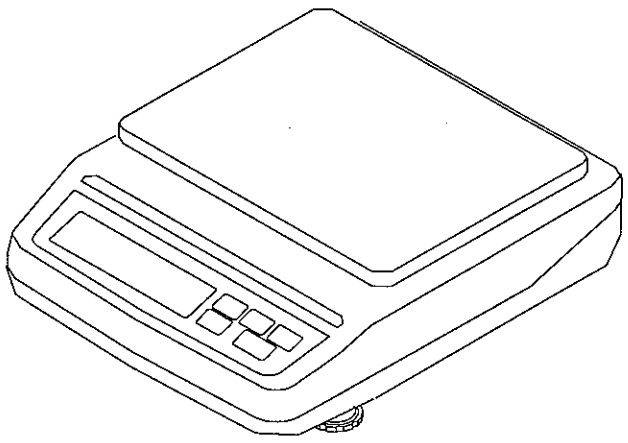
Step 5 When the error is out of tolerance, scrape the load cell gently at the point where the corner load weighing is minimum at step 4, using a file. This scraping action is that gently strokes (rubs) the load cell a few times with the file. The load cell is very sensitive. Do not scrape it excessively.

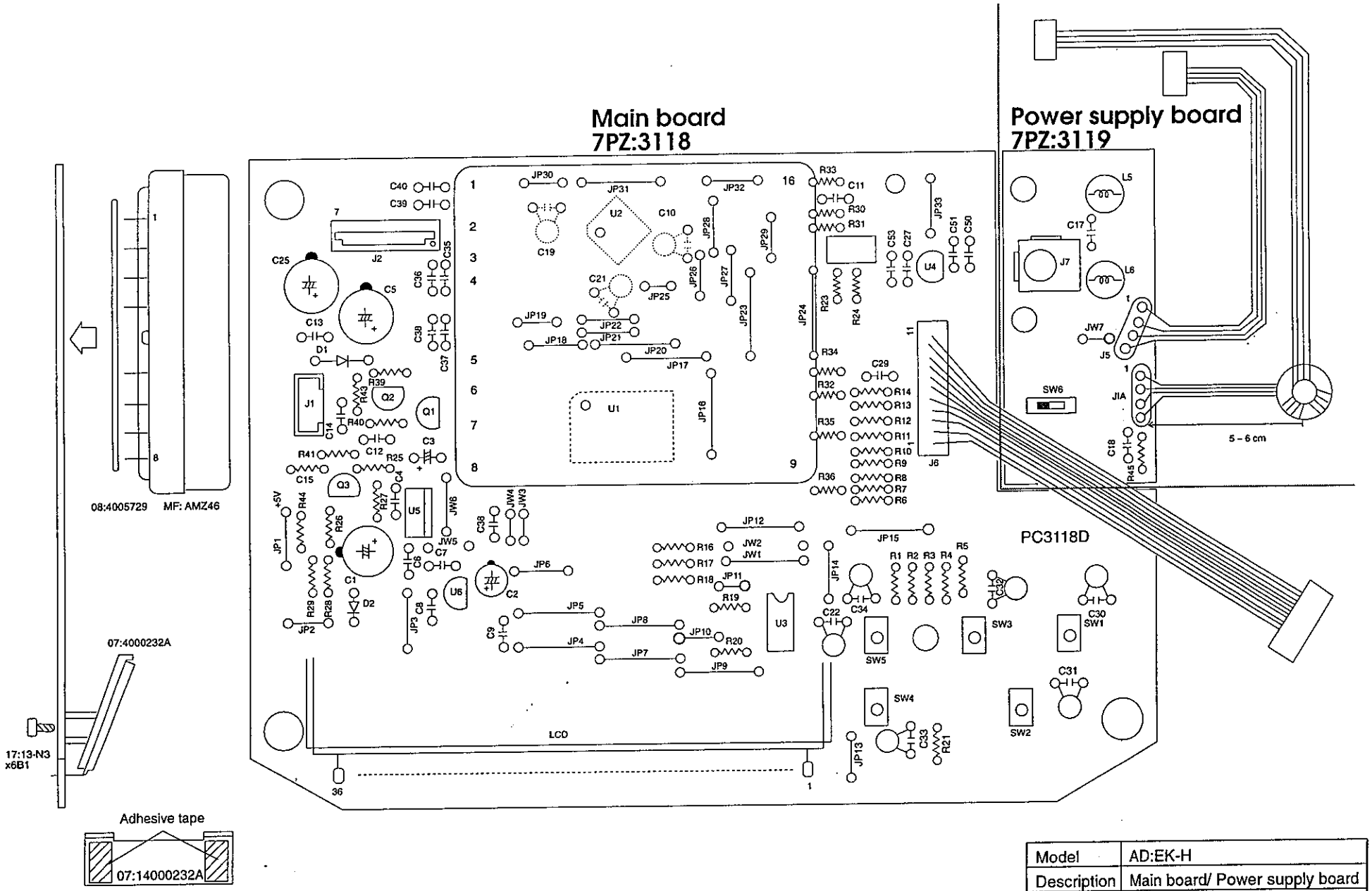


Checking the corner load

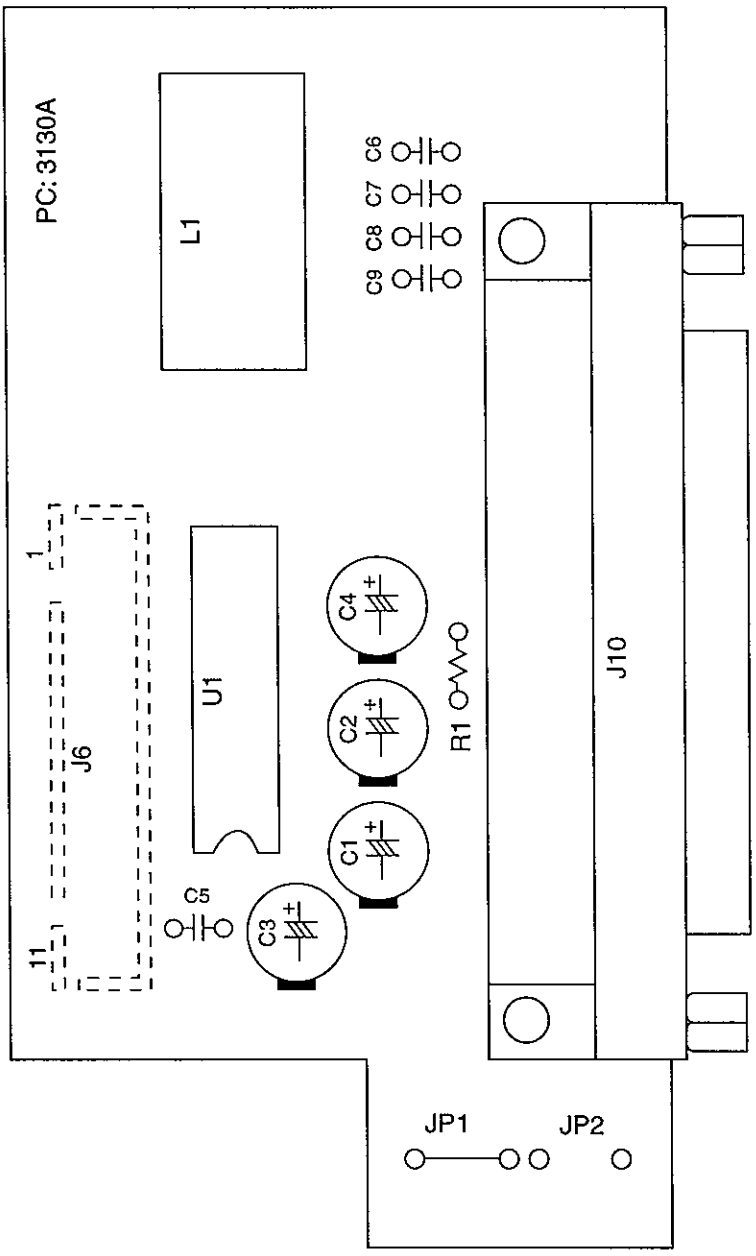
Step 6 Check the corner load error in the way of step 1 ~ step 4.

6. Parts Layout of Circuit

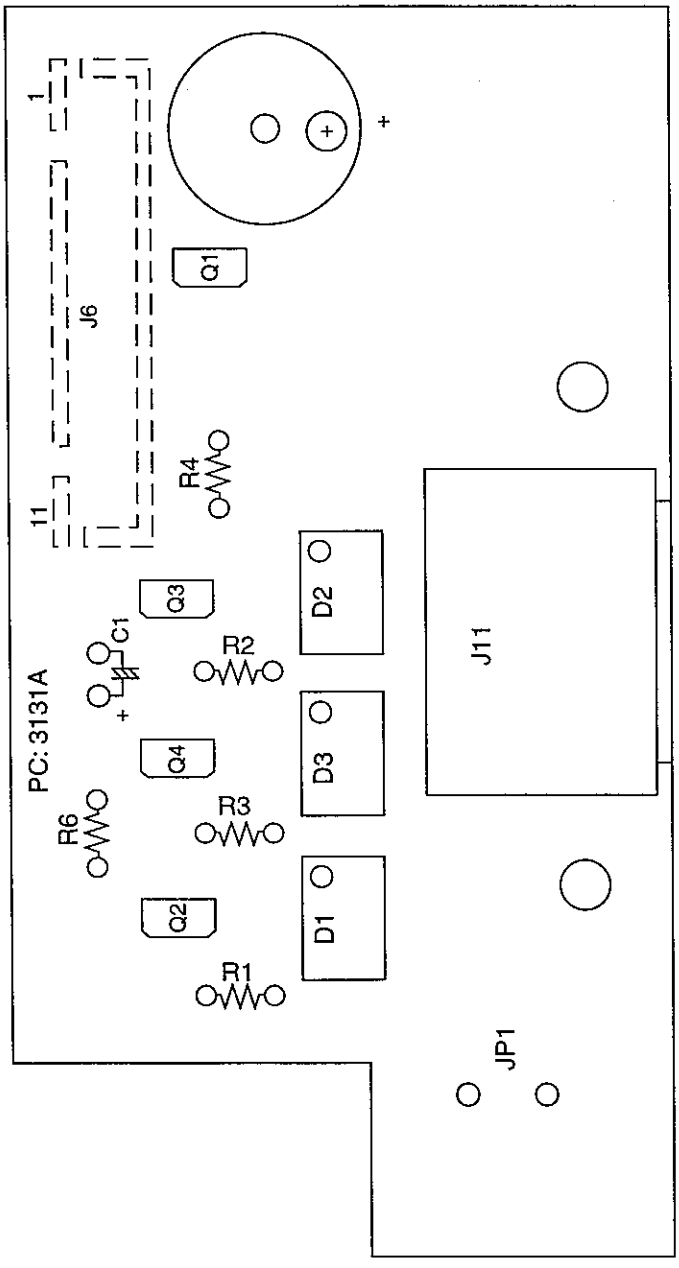




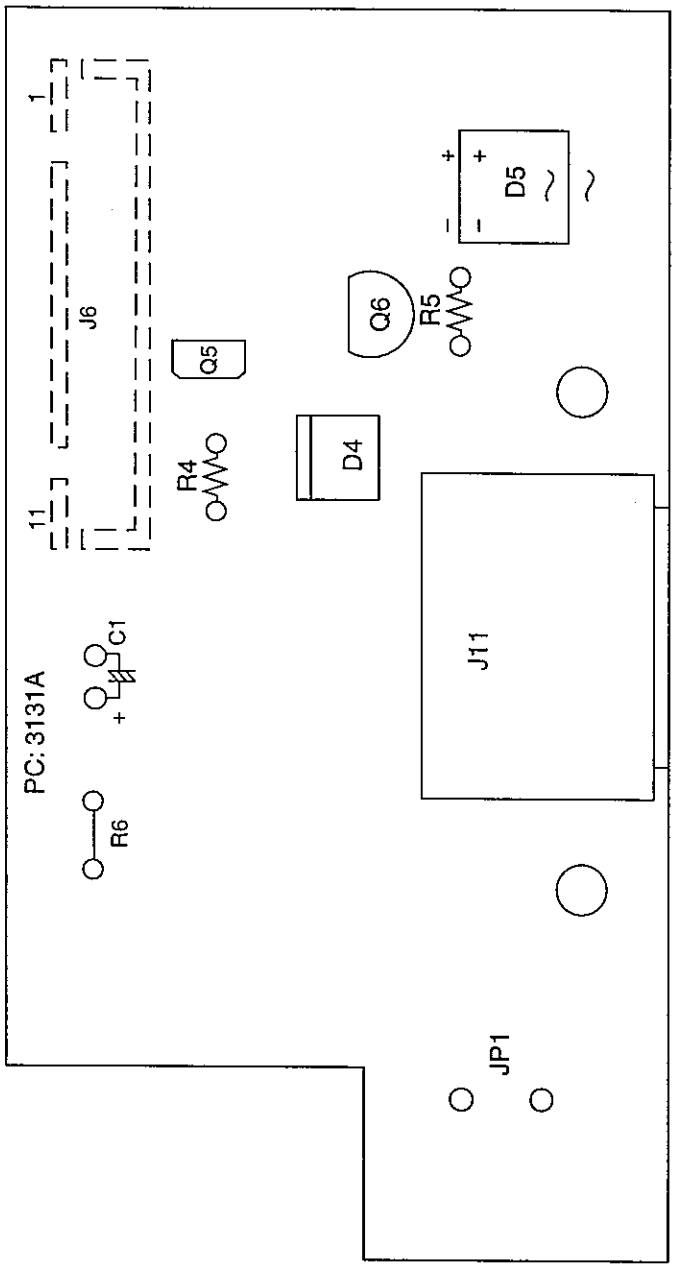
Model	AD:EK-H
Description	Main board/ Power supply board
Stock No.	7PZ:3118/ 7PZ:3119
Drwg. No.	QD-KZ3-000330D



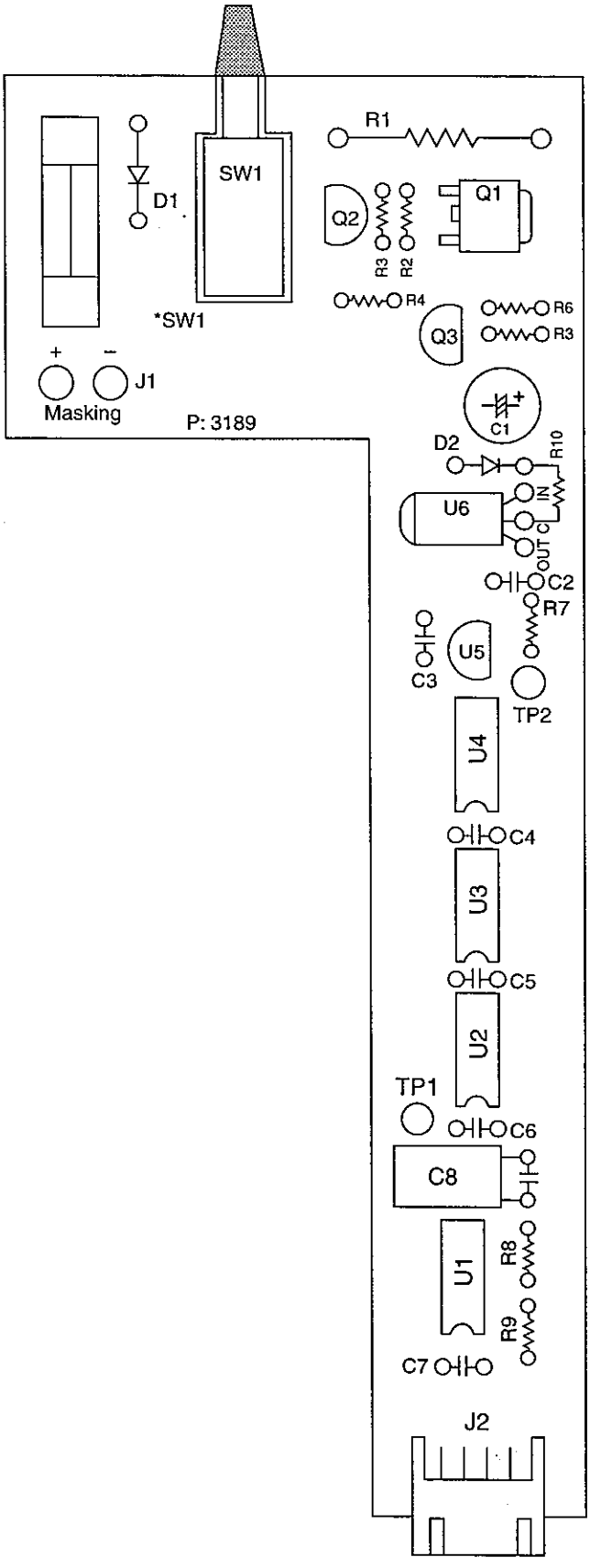
Model	AD:EK-03H
Description	RS-232C
Stock No.	7PZ:3130
Drwg. No.	QD-KZ4-000111A



Model	AD:EK-04H
Description	Comparator
Stock No.	7PZ:3131A
Drwg. No.	QD-KZ4-000112

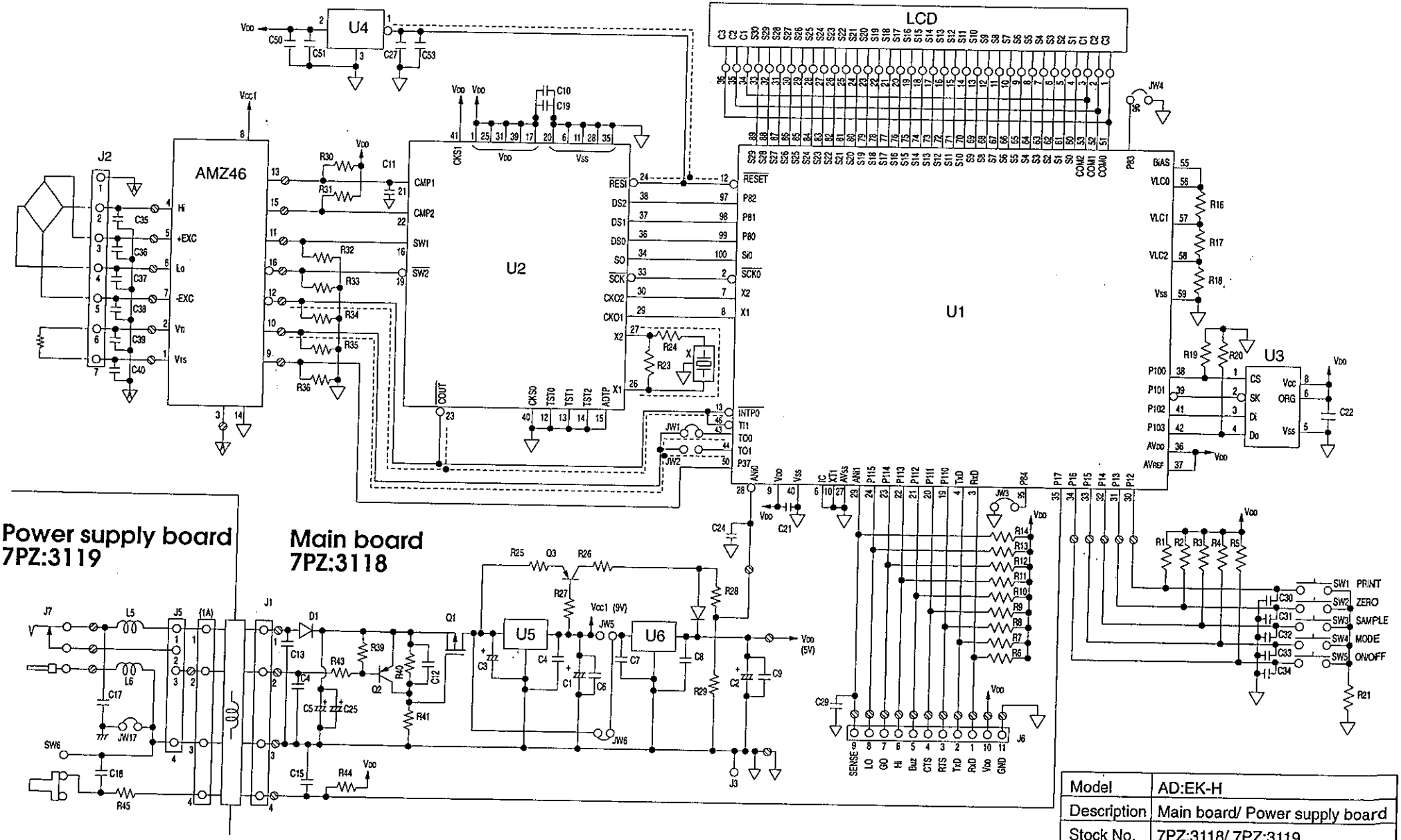


Model	AD:EK- 05H
Description	Current loop
Stock No.	7PZ:3131B
Drwg. No.	QD-KZ4-000113A

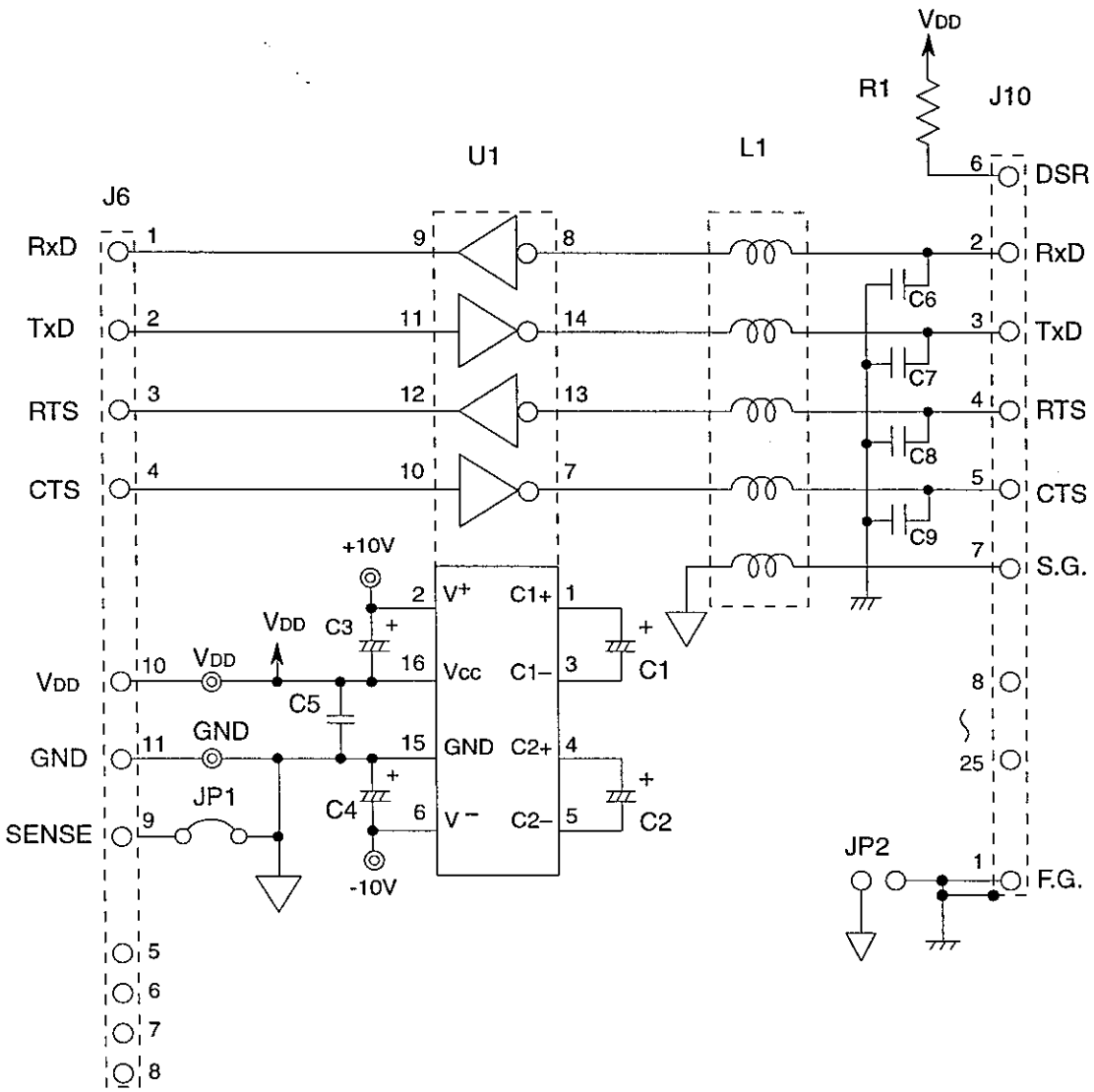


Model	AD:EK-09H
Description	Battery
Stock No.	7PZ:3189
Drwg. No.	QD-KZ4-000114

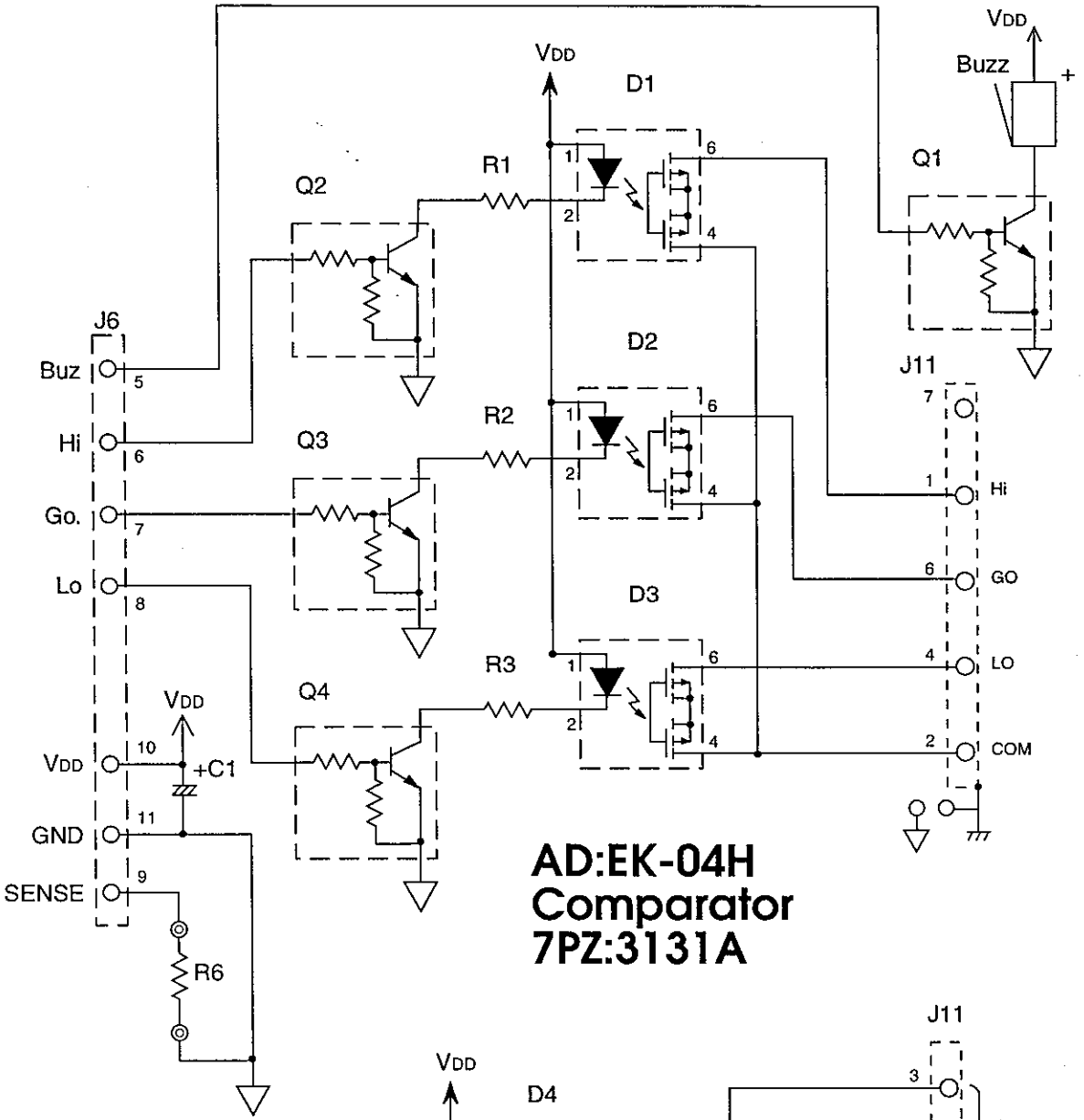
7. Circuit Diagrams



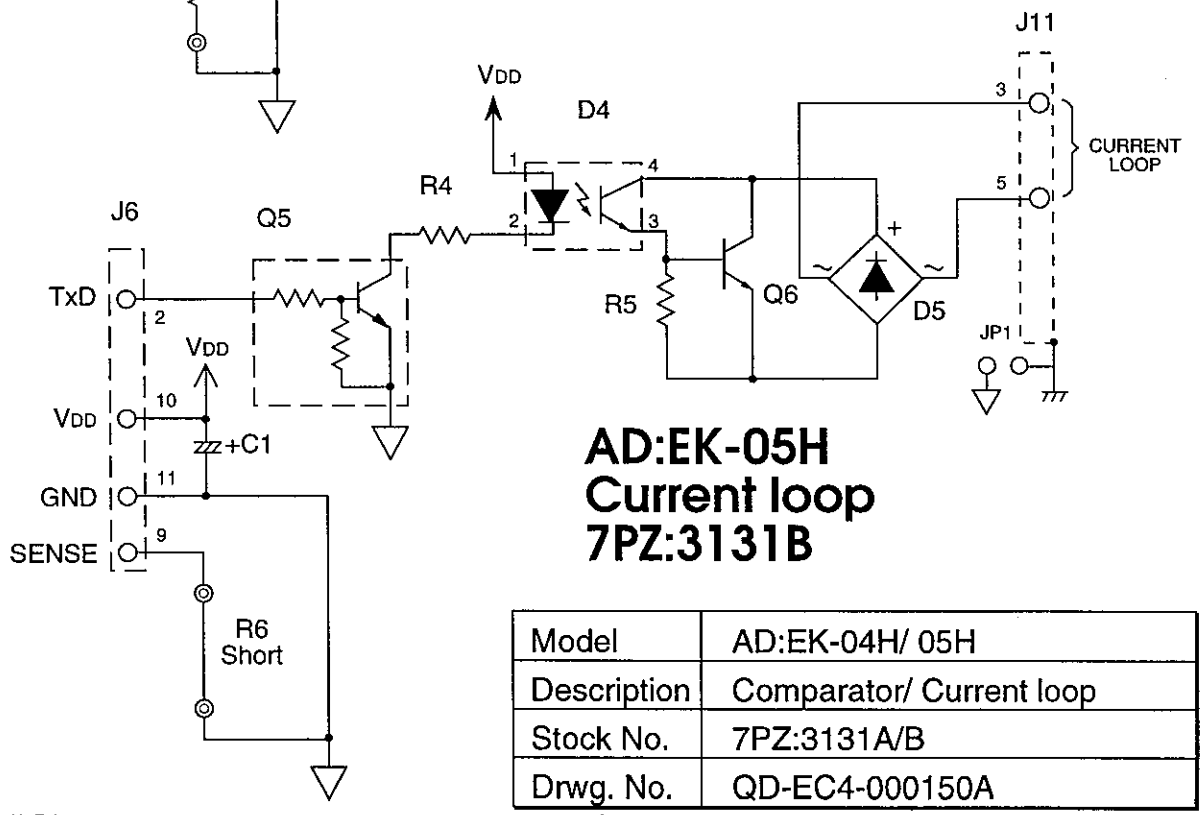
Model	AD:EK-H
Description	Main board/ Power supply board
Stock No.	7PZ:3118/ 7PZ:3119
Drwg. No.	QD-EC3-000247B



Model	AD:EK-03H
Description	RS-232C
Stock No.	7PZ:3130
Drwg. No.	QD-EC4-000149

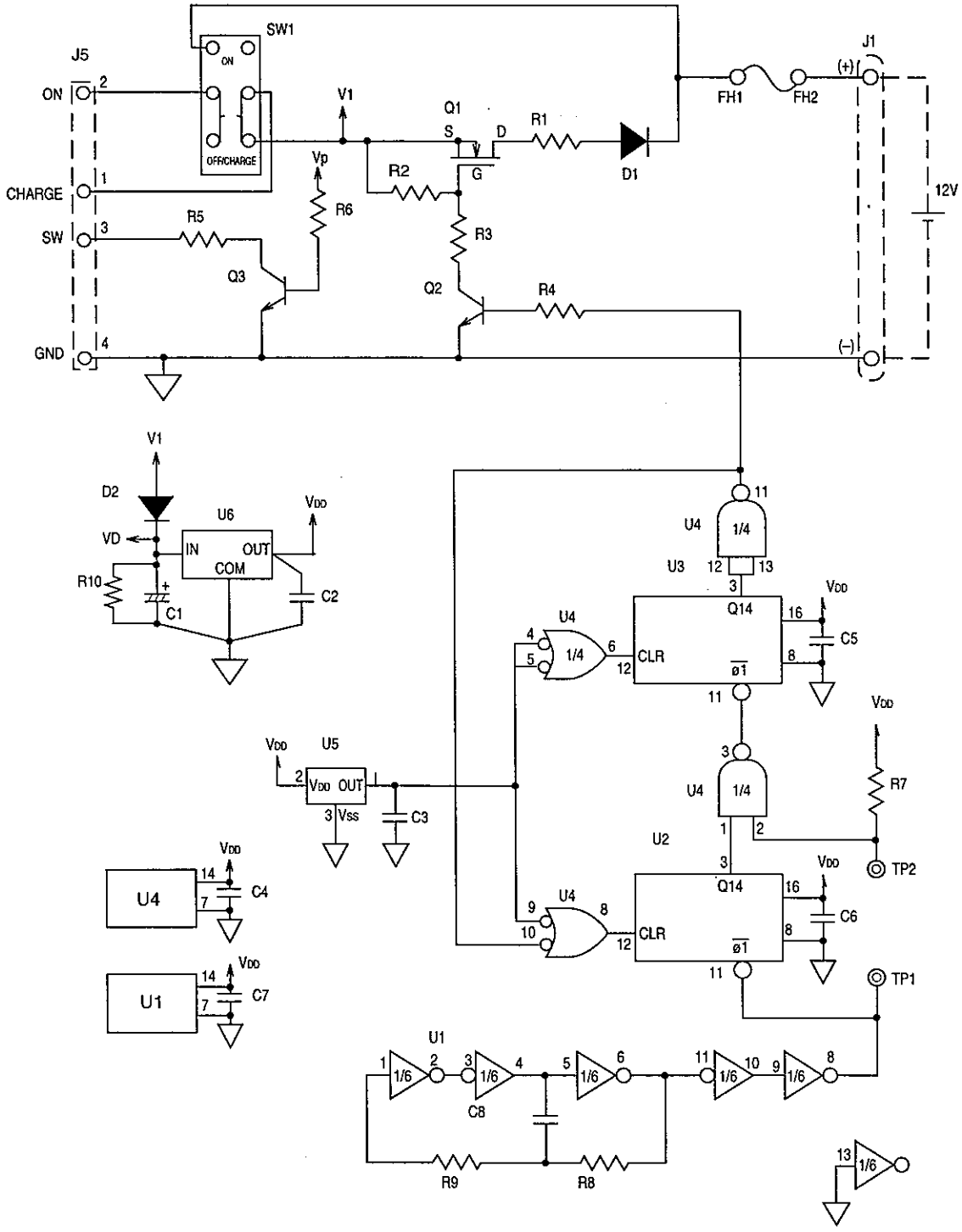


AD:EK-04H
Comparator
7PZ:3131A



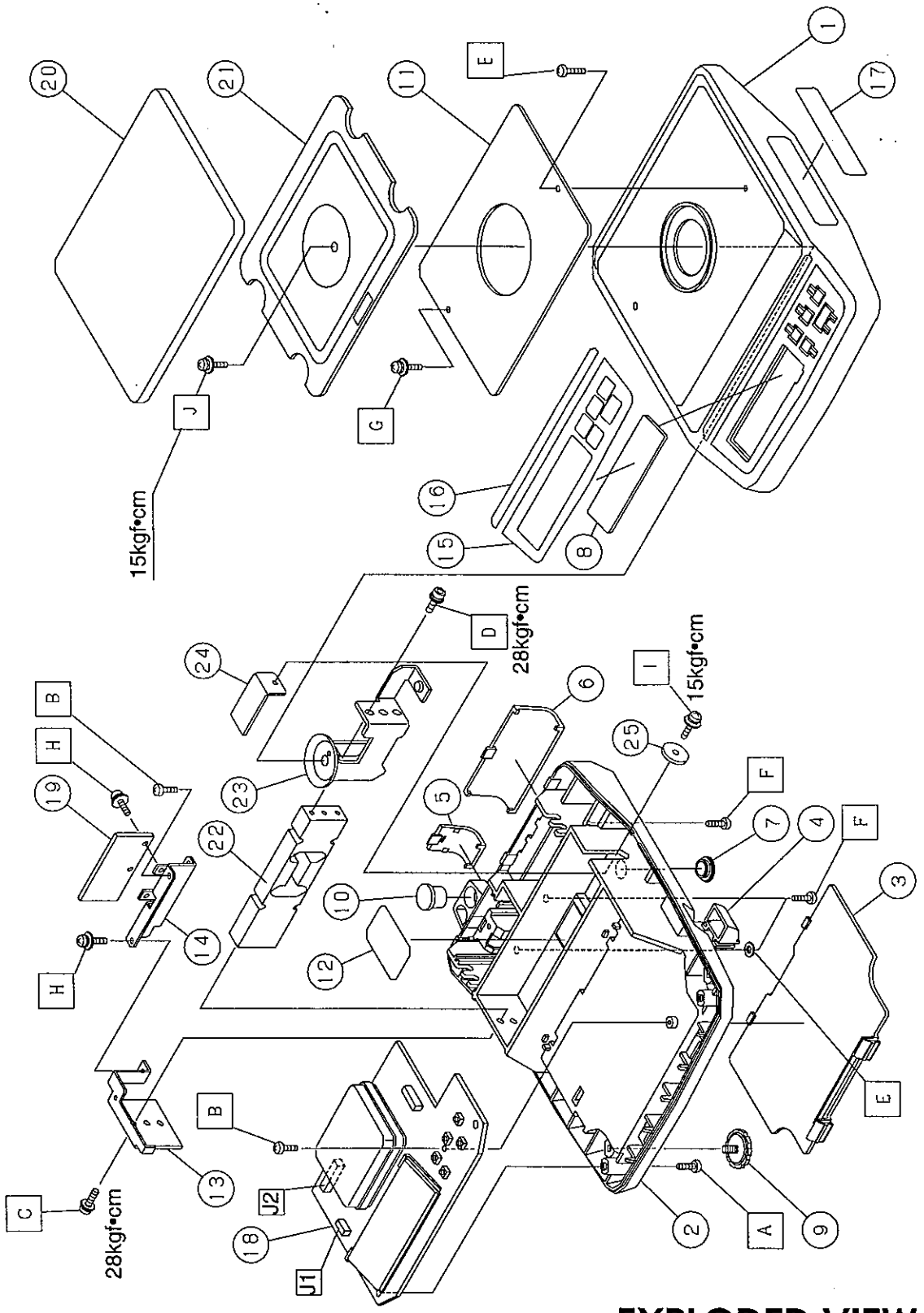
AD:EK-05H
Current loop
7PZ:3131B

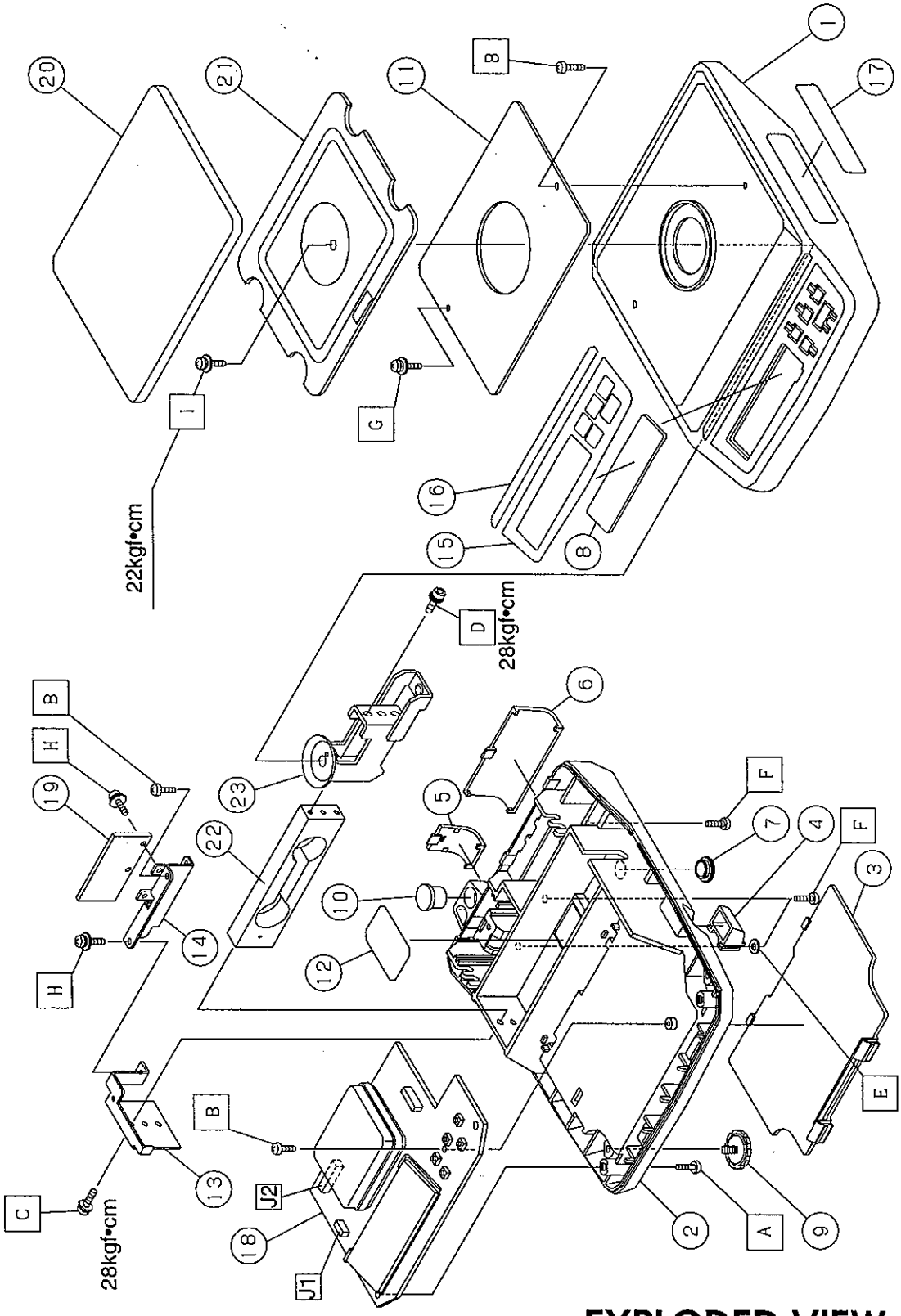
Model	AD:EK-04H/ 05H
Description	Comparator/ Current loop
Stock No.	7PZ:3131A/B
Drwg. No.	QD-EC4-000150A



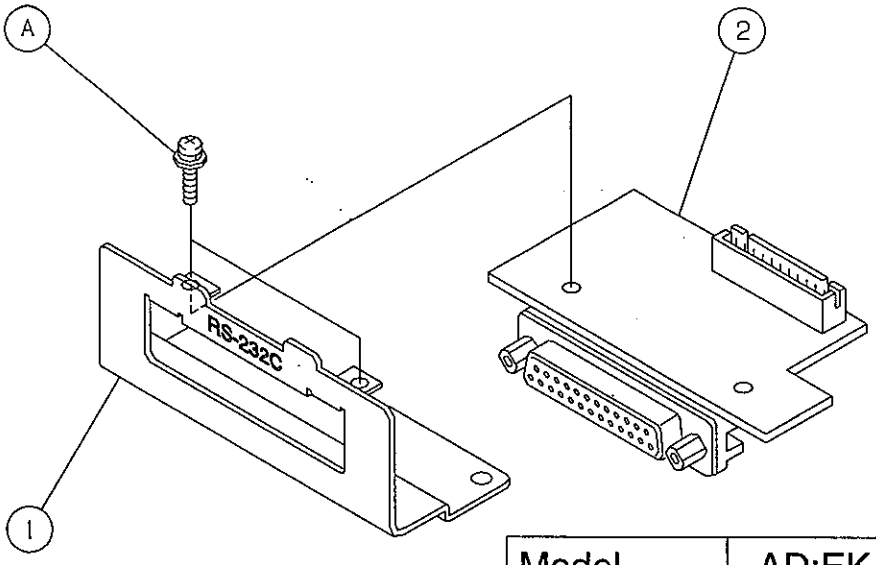
Model	AD:EK-09H
Description	Battery
Stock No.	7PZ:3189
Drwg. No.	QD-EC4-000151

8. Exploded Views

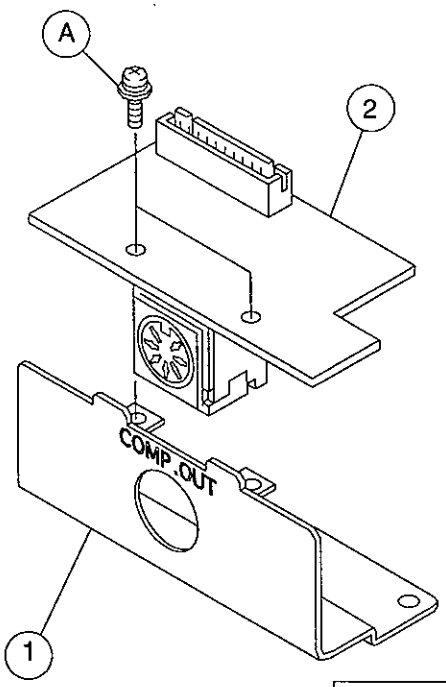




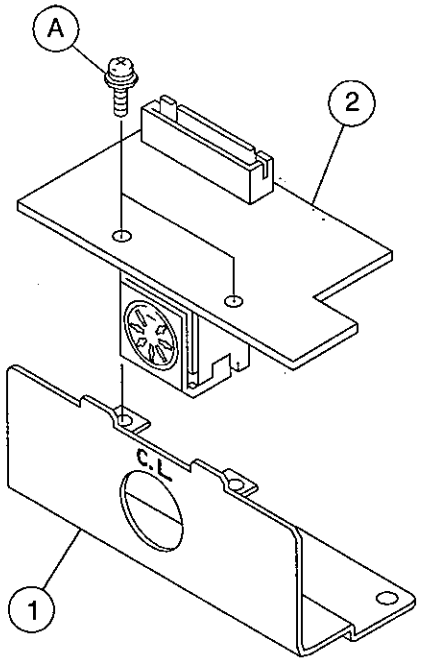
EXPLODED VIEW
EK-4000H / 6000H



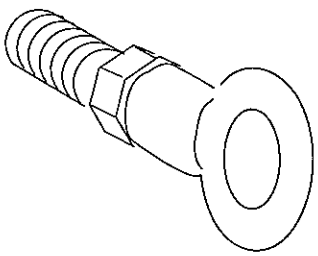
Model	AD:EK-03H
Description	Serial Interface
Stock No.	
Drwg. No.	QD-AS4-000378C



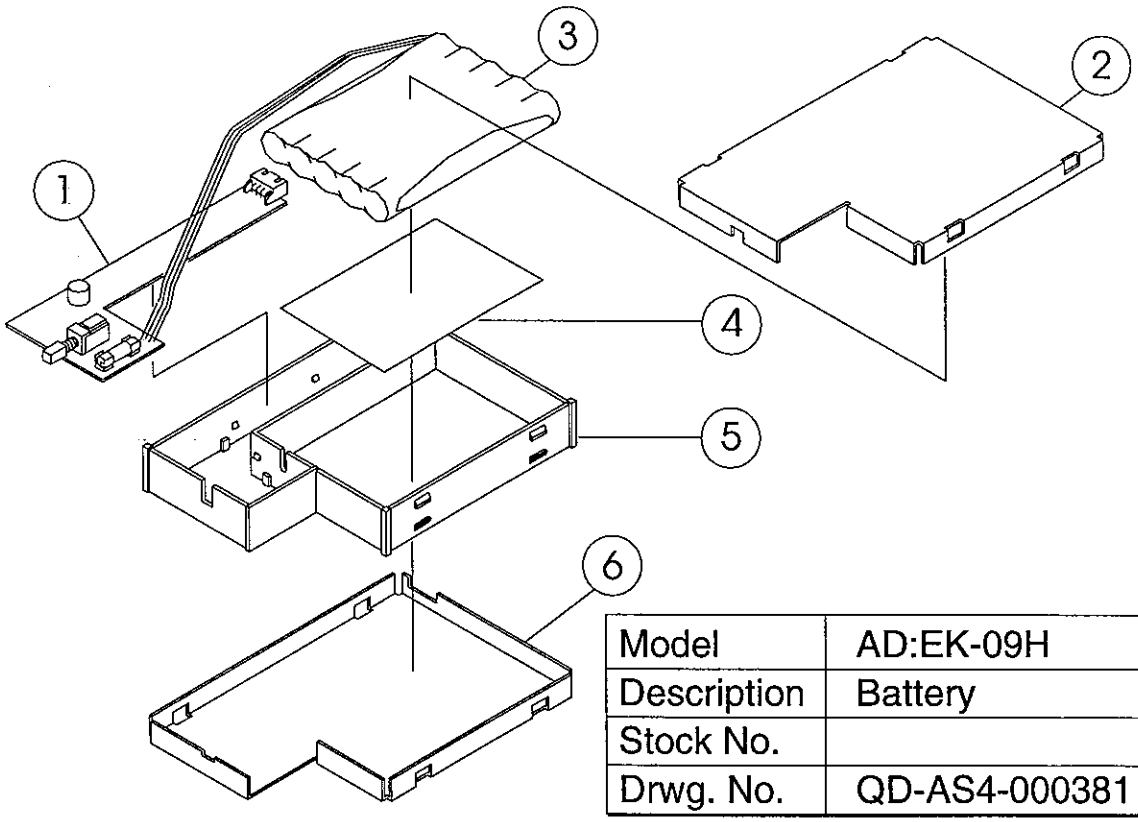
Model	AD:EK-04H
Description	Comparator output
Stock No.	
Drwg. No.	QD-AS4-000379B



Model	AD:EK-05H
Description	Current Loop
Stock No.	
Drwg. No.	QD-AS4-000380B



Model	AD:EK-07H
Description	Under Hook
Stock No.	
Drwg. No.	



Model	AD:EK-09H
Description	Battery
Stock No.	
Drwg. No.	QD-AS4-000381

9. Parts List (of Circuit Diagrams and Exploded Views)

EK-400H/600H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	07:1000053A	Upper case	1
2	07:1000054A	Lower case	1
3	07:2000269	Battery cover	1
4	07:3002331	Cap	1
5	07:3000115	CAL switch cover	1
6	07:3000116	Option blank panel	1
7	07:4000318	Cap B	1
8	07:4000316	Filter	1
9	07:A46041A	Leveling foot	4
10	10:MR14	Level vial	1
11	04:4005555A	Earth plate	1
12	04:4005556	Stopper plate	1
13	04:4005557	Loadcell support	1
14	04:4005558A	Cirucit Earth plate	1
15	08:3002460	Keysheet	1
16	08:3002461-2	Model sheet (EK-400H)	1
	08:3002461-3	Model sheet (EK-600H)	1
	08:3003135-1	Model sheet (EK-600H-EC)	1
17	08:4002805	Rated power sheet	1
	08:4007100-1	Descriptive markings label (EK-600H-EC)	1
18	7PZ:3118	Main board assembly	1
19	7PZ:3119	Power supply board assembly	1
20	04:A44255	Weighing pan	1
21	09:A33750	Pan support	1
22	LC:123-600	Loadcell	1
23	04:4005826A	Load angle	1
24	04:4005731	Upper stopper	1
25	04:4005732A	Stopper support	1
A	17:14FN-P3X10	Tapping screw 3X10	2
B	17:14FN-P3X6	Tapping screw 3X6	3
C	17:06FN-L4X12	Allen head cap screw M4X12	3
D	17:06FN-L4X10	Allen head cap screw M4X10	3
E	17:04-22-FN3	Plain washer M3	1
F	17:01FN-B3X10	Binding head screw M3X10	3
G	17:02FN-L3X10	Type A screw M3X10	1
H	17:02FN-L3X6	Type A screw M3X6	3
I	17:02FZ-L4X12	Type A screw M4X12	1
J	17:02FN-L4X10	Type A screw M4X10	1

Type A screw : Pan head screw with plain and spring washer

EK-4000H/6000H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	07:1000053A	Upper case	1
2	07:1000054A	Lower case	1
3	07:2000269	Battery cover	1
4	07:3002331	Cap	1
5	07:3000115	CAL switch cover	1
6	07:3000116	Option blank panel	1
7	07:4000318	Cap B	1
8	07:4000316	Filter	1
9	07:A46041A	Leveling foot	4
10	10:MR14	Level vial	1
11	04:4005555A	Earth plate	1
12	04:4005556	Stopper plate	1
13	04:4005557	Loadcell supporter	1
14	04:4005558A	Cirucit Earth plate	1
15	08:3002460	Keysheet	1
16	08:3002461-5	Model sheet(EK-4000H)	1
	08:3002461-6	Model sheet(EK-6000H)	1
	08:3003135-2	Model sheet (EK-6000H-EC)	1
17	08:4002805	Rated power sheet	1
	08:4007100-2	Descriptive markings label (EK-6000H-EC)	1
18	7PZ:3118	Main board assembly	1
19	7PZ:3119	Power supply board assembly	1
20	04:A44255	Weighing pan	1
21	09:A3002540	Pan support	1
22	LC:123-6K	Loadcell	1
23	04:3000117B	Load angle	1
A	17:14FN-P3X10	Tapping screw 3X10	2
B	17:14FN-P3X6	Tapping screw 3X6	3
C	17:06FN-L4X12	Allen head cap screw M4X12	3
D	17:06FN-L4X10	Allen head cap screw M4X10	3
E	17:04-22-FN3	Plain washer M3	1
F	17:01FN-B3X10	Binding head screw M3X10	3
G	17:02FN-L3X10	Type A screw M3X10	1
H	17:02FN-L3X6	Type A screw M3X6	3
I	17:02FZ-L5X10	Type A screw M5X10	1

Type A screw : Pan head screw with plain and spring washer

EK-03H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	01:3002332A	OP-03 Panel	1
2	7PZ:3130	Serial Interface board assembly	1
A	17:02FN-S3X10	Pan head screw M3X10	2

EK-04H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	01:3002333A	OP-04 Panel	1
2	7PZ:3131A	Comparator output board assembly	1
A	17:02FN-S3X8	Type A screw M3X8	2

EK-05H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	01:3002334A	OP-05 Panel	1
2	7PZ:3131B	Current loop board assembly	1
A	17:02FN-S3X8	Type A screw M3X8	2

EK-07H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	10:M8EYENUTS-S	Eyenut	1
	05:4000351	Lod	1

EK-09H PARTS LIST

Symbol	Part No.	Part Name	Q'ty
1	7PZ:3189	Battery board assembly	1
2	02:3002335	Cover A	1
3	EB:10AA600-1053	NiCd Battery	1
4	06:4005820	Sheet	1
5	07:2000270	Chassis	1
6	02:3002336	Cover B	1

Type A screw : Pan head screw with plain and spring washer

7PZ:3118 PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3118D	Printed wiring board	1
C1,5,25	CK:ECA1VM471-T	Chemical Capacitor	3
C2	CK:ECA1CM101-T	Chemical Capacitor	1
C3	CT:1V010T	Tantalum Capacitor	1
C4,6-9,13,15,22,30-40,50,51	CC:0.1U25VT	Ceramic Capacitor	21
C10,19,20	CC:0.1U25V	Ceramic Capacitor	3
C11,12,14,24,29	CC:330PT	Ceramic Capacitor	5
C27	CC:0.022UT	Ceramic Capacitor	1
C53	CC:0.01UT	Ceramic Capacitor	1
D1	DI:SB10-03A2-T	Diode	1
	DI:1SS270T	Diode	1
J1	JI:4P-ST2-EF	Pin Header	1
J2	JE:HBLB7S-IJ	Connector	1
J6	KO:1590-1130T19	Cable	1
LCD	ED:E-7339	LCD	1
	07:4000323A	LCD Holder	1
	17:13-N3X6B1	Screw	2
Q1	QF:J196-T	FET	1
Q2,3	QT:A1015YT	Transistor	2
R1-14	RC:NAT100KJT	Carbon Resistor	14
R16-18,27,32-34,36,39-41	RC:NAT10KJT	Carbon Resistor	11
R19,20,28,29	RC:NAT47KJT	Carbon Resistor	4
R21,25	RC:NAT100RJT	Carbon Resistor	2
R23	RC:NAT1MJT	Carbon Resistor	1
R24	RC:NAT470RJT	Carbon Resistor	1
R26	RC:NAT33KJT	Carbon Resistor	1
R30,31	RC:NAT4.7KJT	Carbon Resistor	2
R35	RC:NAT2.2KJT	Carbon Resistor	1
R43	RC:NAT6.8KJT	Carbon Resistor	1
R44	RC:NAT22KJT	Carbon Resistor	1
SW1-5	SK:SKHHAK	Tact Switch	5
U1	UC:D78P064-EKH	CPU	1
U2	UC:TC140G02AU12	Gate Array	1
U3	UC:93LC56P	EEPROM	1
U4	UA:S-8054ALR-Z	Comparator	1
U5	UR:AN7709F	Regulator	1
U6	UR:TA78L005AP-T	Regulator	1
	MF:AMZ46	Analog Module	1
X1	XT:C4SB12M-K02U	Crystal	1
	08:4005729	Isolation sheet	1

7PZ:3119 PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3119D	Printed wiring board	1
C17,18	CC:0.1U25VT	Ceramic Capacitor	2
J1A	KO:964-04S040	Cable	1
J5	KO:1382-04S030	Cable	1
J7	JE:0486-01-010	Connector	1
L5,6	LL:LHL06TB470K	Inductor	2
	LR:DF-R-19A-M-A	Inductor	1
R45	RC:NAT1.2KJT	Carbon Resistor	1
	04:4005558A	Earth plate	1
SW6	SS:MM-1202N	Slide switch	1

7PZ:3130 PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3130A	Printed wiring board	1
C1-4	CK:SRA25VB-47	Electrolytic Capacitor	4
C5	CC:FK16Y5V1H104	Ceramic Capacitor	1
C6-9	CC:22P	Ceramic Capacitor	4
J6	JI:B11B-XH-A	Connector	1
J10	JA:17LE-13250	D-Sub Connector	1
L1	NF:D-42C	Choke Coil	1
R1	RC:NAT3.3K	Carbon Resistor	1
U1	UC:MAX232CPE	RS232C Driver	1

7PZ:3131A PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3131A	Printed wiring board	1
C1	CT:1A4R7	Tantalum Capacitor	1
D1-3	DF:AQV253	Phot MOS Relay	3
J6	JI:B11B-XH-A	Pin Header	1
J11	JA:TCS5076-17	DIN Connector	1
Q1-4	QT:BA1A4P	Transistor	4
R1-3	RC:NAT3.3K	Carbon Resistor	3
R6	RC:NAT18K	Carbon Resistor	1
	ET:MFG-12C-5	Buzzer	1

7PZ:3131B PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3131A	Printed wiring board	1
C1	CT:1A4R7	Tantalim Capacitor	1
D4	DF:PS2501-1L/K	Phot Coupler	1
D5	DI:1B4B42	Bridge Diode	1
J6	JI:B11B-XH-A	Pin Header	1
J11	JA:TCS5076-17	DIN Connector	1
Q5	QT:BA1A4P	Transistor	1
Q6	QT:C1815Y	Transistor	1
R4	RC:NAT2.7K	Carbon Resistor	1
R5	RC:NAT680R	Carbon Resistor	1

7PZ:3189 PARTS LIST

Symbol	Part No.	Part Name	Q'ty
	PC:3189	Printed wiring board	1
C1	CK:SRA35VB-47	Electrolytic Capacitor	1
C2-7	CC:FK16Y5V1H104	Ceramic Capacitor	6
C8	CM:5002103J1	Film Capacitor	1
D1	DI:F14A	Diode	1
D2	DI:1SS270	Diode	1
FH1,2	FH:85PN0819	Fuse Holder	2
	FS:F7142-1A	Fuse	1
J5	JI:S4B-XA-A	Connector	1
Q1	QF:J132-Z-V	MOS FET	1
Q2,3	QT:C1815Y	Transistor	2
R1	RE:MOR2B15RJ	Carbon Resistor	1
R2,3,5,10	RC:NAT10K	Carbon Resistor	4
R4,6,7,9	RC:NAT22K	Carbon Resistor	4
R8	RM:RNM19.1KF	Metal Film Resistor	1
SW1	SP:SPUJ19F-2N-W	Push Switch	1
TP1,2	TM:LC-2-G-0	Test Terminal	2
U1	UC:HCU04F-V	Inverter	1
U2,3	UC:HC4060F	Counter	2
U4	UC:HC00F-V	NAND Gate	1
U5	UA:S-8054ALR	Voltage Comparator	1
U6	UR:TA78L005AP	Regulator	1