

## MAINTENANCE MANUAL

Maintenance-AD-4714-v.1.a 92.10.10.OGA

INFRARED MOISTURE DETERMINATION BALANCE





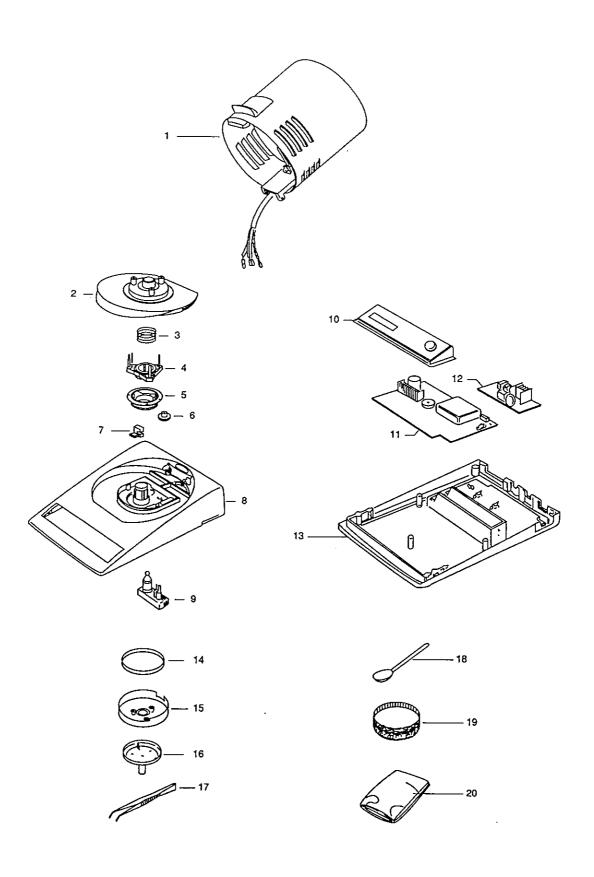
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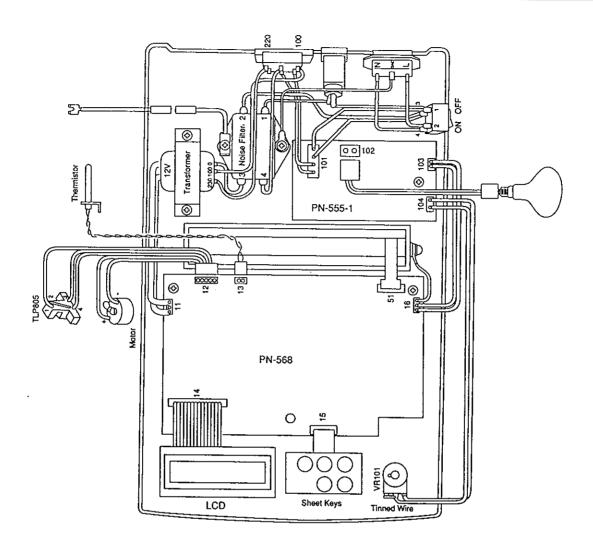
## **PART LIST**

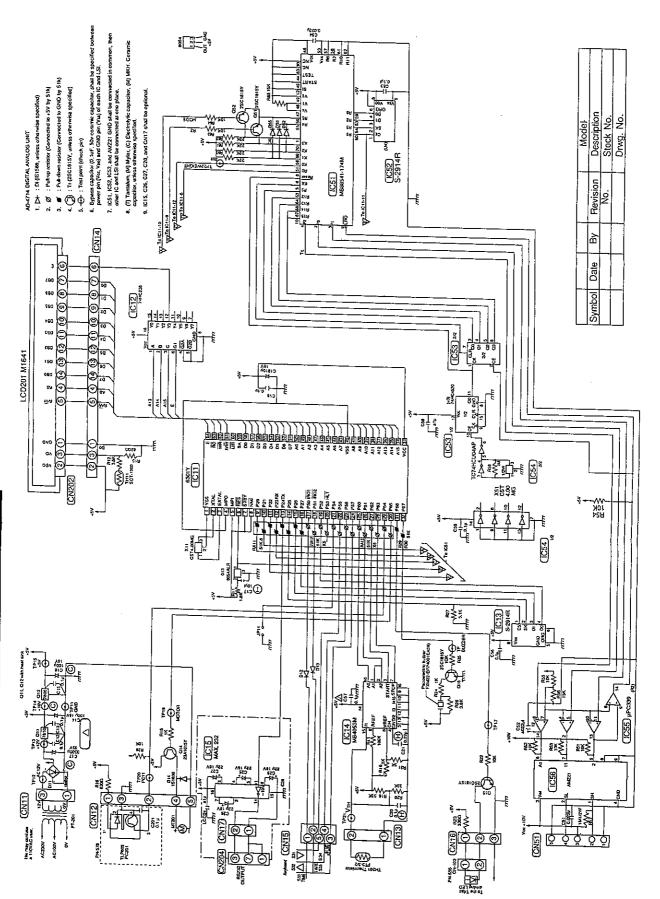
No.	Part No.	Part Name	Specification	Q'ty
1	710-001327	Drying unit Ass'y	(911786)	
2	710-380648	Reflector	PPS LYTON R-7 painted	
3	710-270247	Elevator return spring	SWP ø1 rustproofing	
4	710-380649	Lift base	PPS LYTON R-7	
5	710-380650	Lift gear (large)	PC	
6	710-380651	Lift gear (small)	PC	
7		Photointerrupter	TLP 805 (TOSHIBA)	
8	710-320645	Body upper case	ABS STYLAK 185 light gray	
9	710-FG45BM	Motor	FG-45BM geared motor (FUJI MICRO)	
10	710-001330	Display and operation unit Ass'y	(911789)	
11	710-001331	Mother board	(911790)	
12	710-001332	Dimming board	(911791)	
13	710-380646	Body lower case	ABS STYLAK 185 light gray	
14	710-112437	Sample Pan	SUS polished t:0.3	
15	710-001333	Breeze Break Ass'y	(911792)	
16	710-001334	Pan support	(911793)	
17	710-810342	Tweezers	(HARA SEISAKUSHO)	
18	710-810035	Spoon	SUS (KYORITSU)	
19	710-112470	Aluminum foil	Aluminum foil (10 sheets/1 box) (SHINMEI)	
20		Dust cover		
21		Power transformer	0-100-230V: 0-12V 0.22A (TOEI)	
22	NF-ZGB2201-01	Noise filter	ZGB2201-01U (TDK)	
23		Power change- over switch	SDKGA4 (with index)(ALPS)	
24		Fuse holder	F-140BB (SATO)	-
25		Power inlet	CM-11 (HIRAKAWA)	
26		Power switch	A8CA-207-1 (OMRON)	





## WIRING DIAGRAM

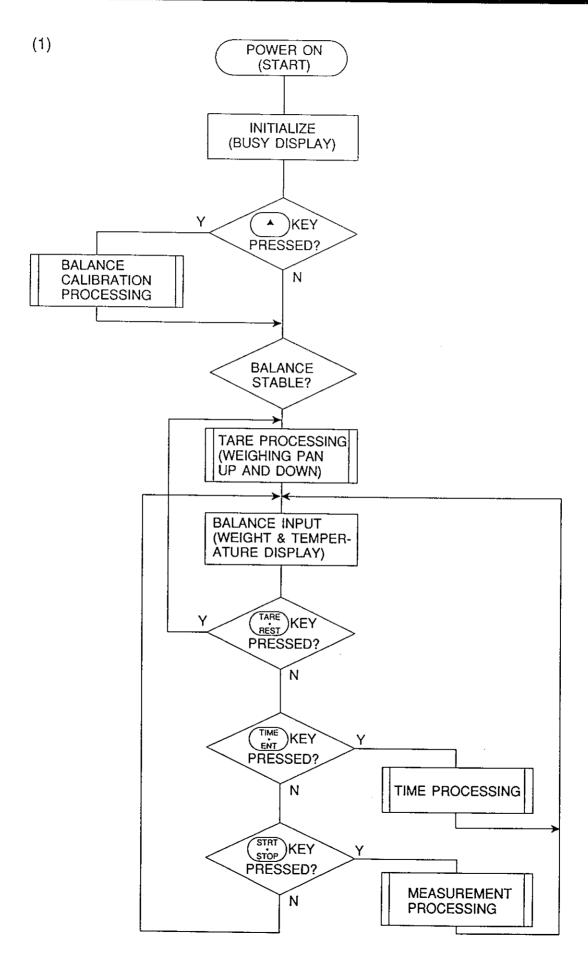


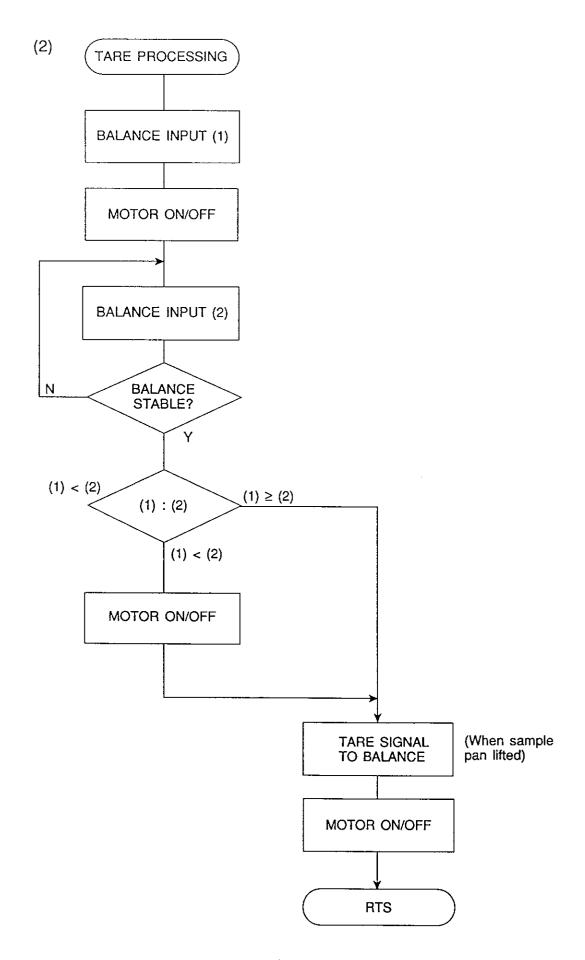


CIRCUIT DIAGRAM

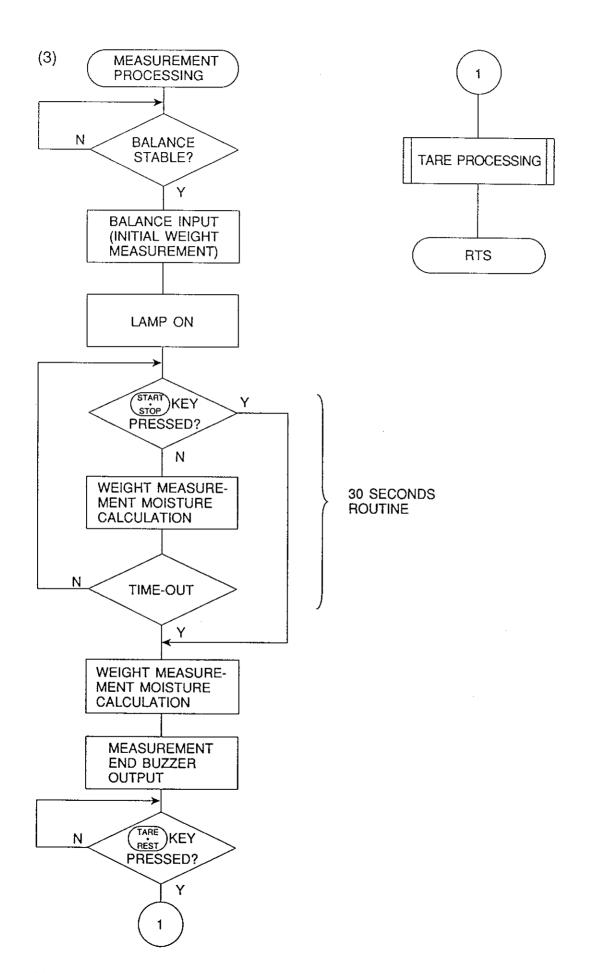


# OPERATION FLOW



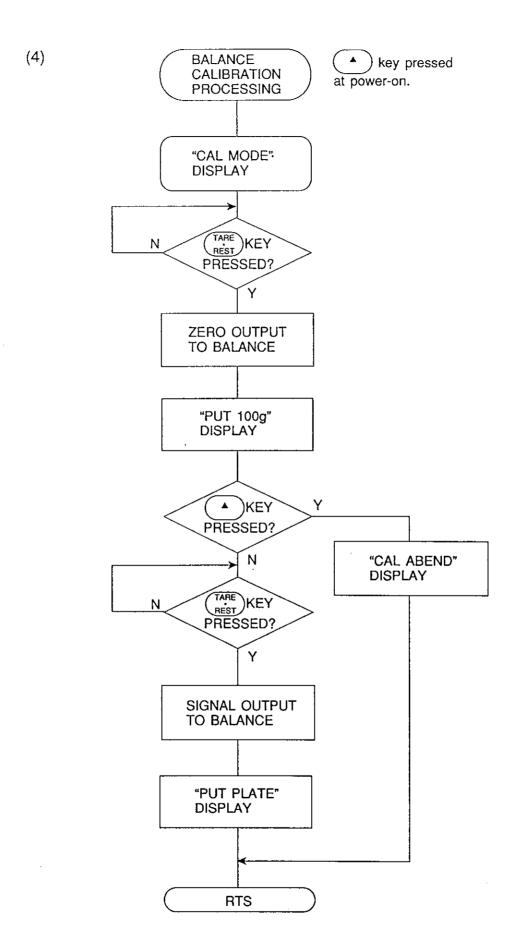


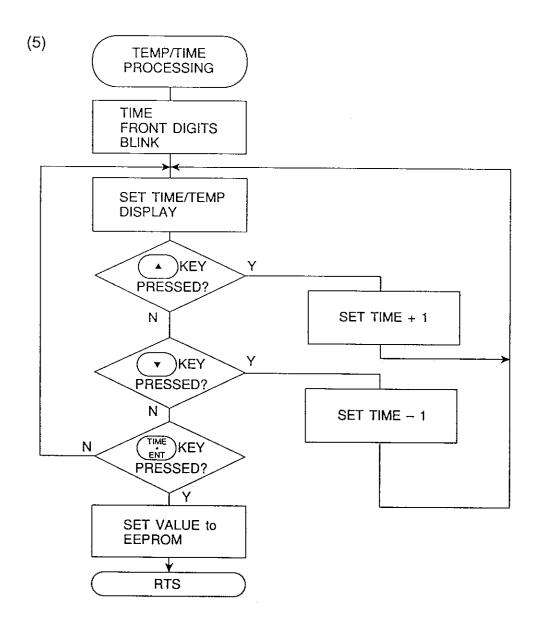
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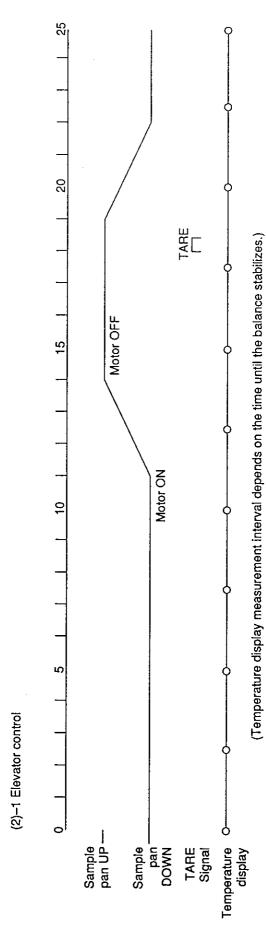
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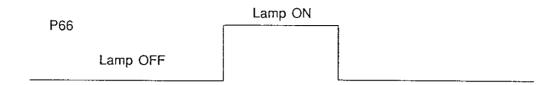
## **ELEVATOR CONTROL**



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© Elevator (sample pan) up: When P65 is turned on, the motor is turned on. When the specified position is reached, the photoisolator turns off the motor.

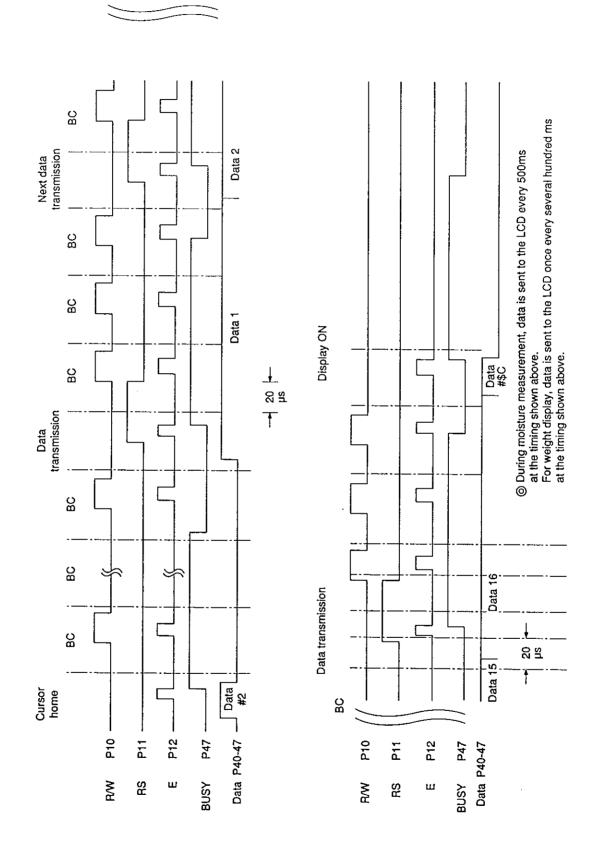
## LAMP CONTROL



The lamp is turned off by turning off and on by a signal at P66 (pin 31) of the processor IC.

The lamp strength is controlled by control circuit variable resistor.

# LCD CONTROL TIMING

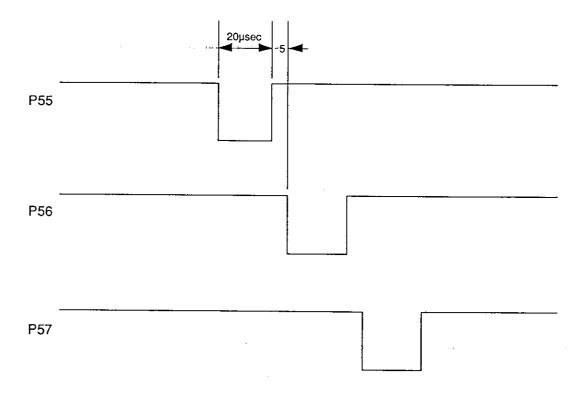


## **KEY SWITCH TIMING**

Key switch timing



When either P50 or P51 is pulled Low while P55 to P57 are Low, an interrupt is generated and the key switch interrupt routine is executed.



The interrupt routine scans P55 to P57 and stores the pressed keys. The key scan interval is divided into several hundred milliseconds.



## MOISTURE CONTENTS CHECK METHOD

1. Dry about 10 grams of beach sand for 10 minutes at AD-4714 dial 6.

Place the sand in a sealed container so that it will not absorb moisture and allow it to cool.

2. After setting the AD-4714 to dial 6 and preheating it, cool it to room temperature.

Accurately measure 8 grams of the beach sand dried above.

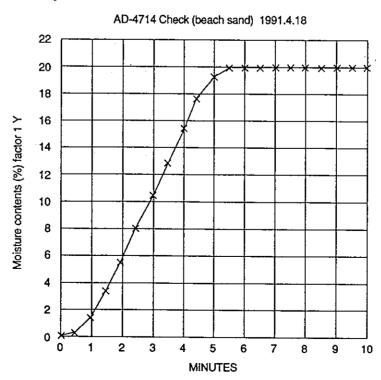
Also add about 2 grams of water (tap water) so that the sand is uniform.

Record the AD-4714 weight at that time.

- 3. Set the AD-4714 to dial 6 and the time to 10 minutes and perform measurement.
- 4. Calculate the moisture from the weight at the beginning of measurement with the equation shown below and compare the calculated value to the value measured by the AD-4714.

Calculated moisture = Weight at start of measurement – 8gr
Weight at start of measurement

- 5. If normal the measured value should be within ±0.3% of calculated value.
- 6. The beach sand (or silica sand) used in one check can also be used in the next check, but it is recommended that the sand be dried for approximately 10 minutes each time it is used.



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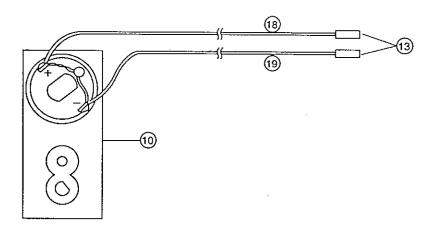


# **WORK STANDARDS**



## Motor Ass'y

10	Motor	FG-45BM (FUJI MICRO)
13	Pin	HNC-2.5S-D-A-G (HIROSE)
18	Lead wire	UL1007 22AWG I:250 yellow
19	Lead wire	UL1007 22AWG I:250 green

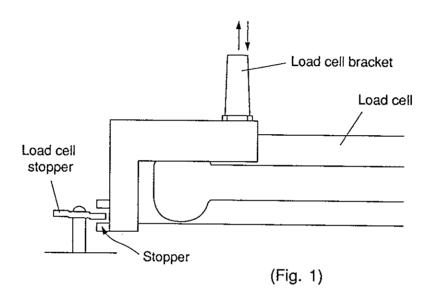


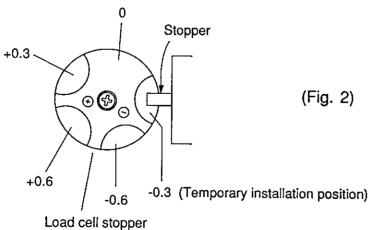
Crimp pins (3) to lead wires (18) and (19).

Solder lead wires to motor (10)

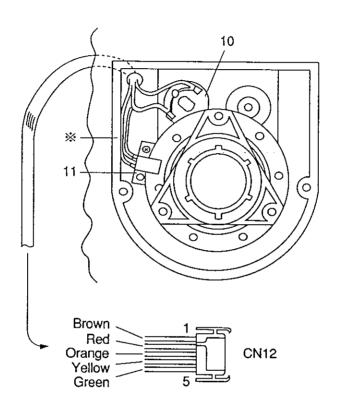
## Load Cell Stopper Adjustment

1.	Temporarily install the load cell stopper at the position shown in Fig. 2.
2.	Move the load cell bracket up and down as shown by the arrow in Fig. 1 and adjust the load cell stopper position so that the up and down movement widths are the same.
3.	If the up width is small, set it to 0 to +0.6.  If the down width is small, set it to -0.6. (See Fig. 2.)





10		Motor Ass'y
11		Photointerrupter Ass'y
CN12	Connector	HNC2-2.5S-5

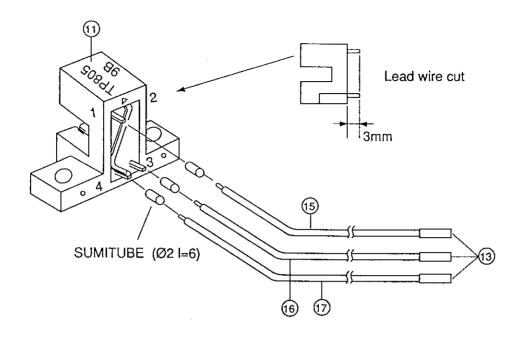


★ Be sure that the wires do not stick out.

(They may be pinched by the reflector.)

\* After installing the reflector, while being careful of the wire indicated by the asterisk (\*), install the CN12 housing.

## Photointerrupter Ass'y (Old)



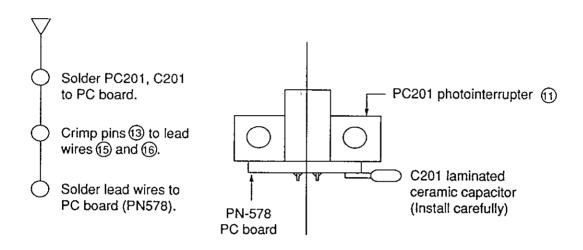
Crimp terminals (3) to lead wires (15) to (7) (without housing).

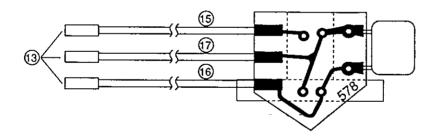
Short photointerrupter lead wire pins 2 and 4 and trim to 3mm.

Solder lead wires (15) to (17) to photointerrupter.

Cover soldered points with SUMITUBE.

Part Name	Q'ty	Part Name	Q'ty
PC board PN-578	1	(3) HNC-2.5S-D-A-G (HIROSE)	3
C201 laminated ceramic capacitor 0.1µ (MURATA)	1	(5) UL1007 28AWG I=250 brown	1
RPE132F104750	-	(6) UL1007 28AWG I=250 red	1
(1) PC201 TLP805 (TOSHIBA)	1	17) UL1007 28AWG I=250 orange	1

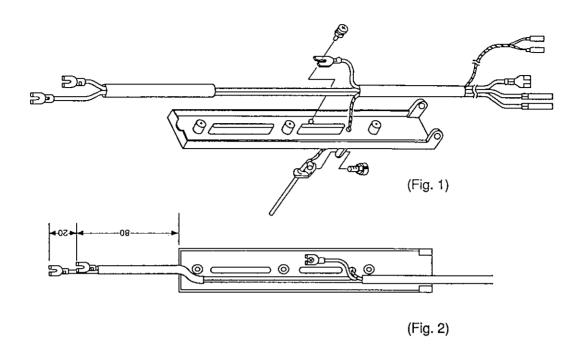


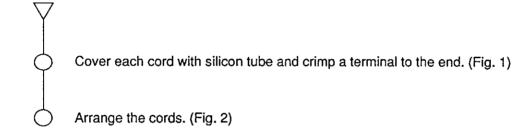


### **NOTE**

When installing the PC board to the body, C201 must not touch the body gear.

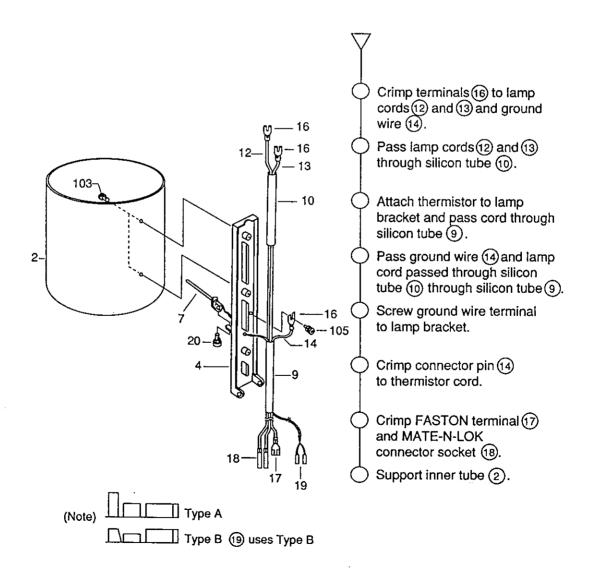
## Lamp Bracket Ass'y



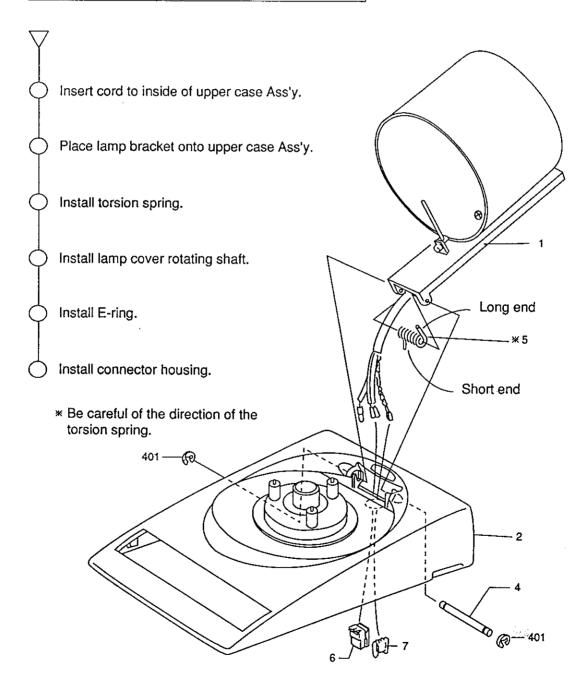


## Drying Unit Ass'y

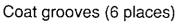
2	112462	Inner tube	18	MATE-N-LOK connector	Socket 170148-1	
4	280241	Lamp bracket	19	Connector pin	HNC-2.5S-D-8-G	(Note
7	970511	Thermistor	20	Stepped knurled screw	M3x8 Ni-3	
9	Silicone tube	ø6 l=100 clear	21			1
10	Silicone tube	ø5 l=100 clear	103	Phillips head screw	Semus C 4x6 Ni-3	
12	Lamp cord	RS-G 0.75 white I=575	105	Phillips head screw	Semus C 3x6 Ni-3	
13	Lamp cord	RS-G I=555				1
14	Ground wire	UL1015 18AWG I=330 green				
16	Crimp terminal	1.25Y-3W				1
17	FASTON terminal	Receptacle 060018-2				

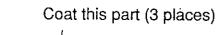


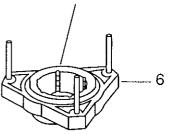
1		Drying unit Ass'y
2		Upper case Ass'y
4	212597	Lamp cover rotating shaft
5	270246	Torsion spring
6	Connector	1-480720-0
7	Connector	HNC-2.5S-2
103	Phillips head screw	Truss 4x6
401	E-ring	M3

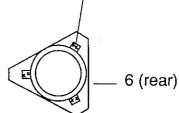


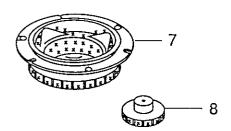
6	380649	Lift base
7	380650	Gear (large)
8	380651	Gear (small)
XX XX	G-50	Silicon grease







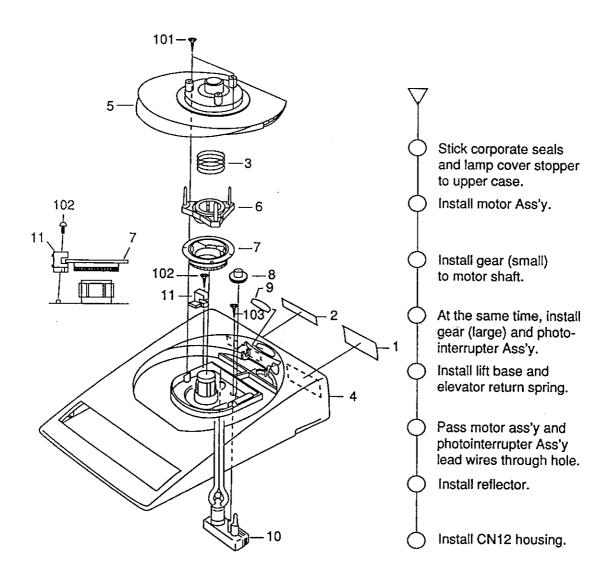




xxx --- Coat these parts with G-50 silicon grease.

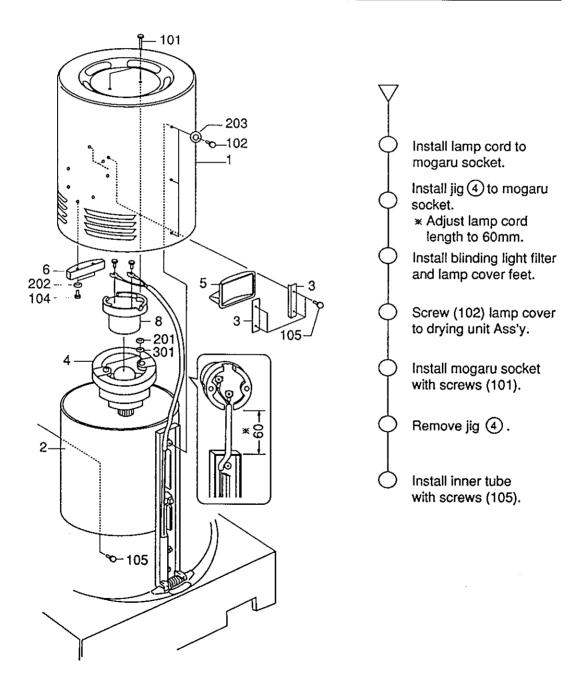
### **Upper Case Ass'y**

1	011302	Corporate seal	8	380651	Gear (small)
(1)		Corporate seal (A&D)	9	850214	Lamp cover stopper
2	011303	Serial No. seal	10	FG-45BM	Motor
3	270247	Elevator return spring	11	TLP805	Photointerrupter
4	380645	Body case (upper)	101	Tapping screw	Pan head 3x10 black
5	380648	Reflector	102	Tapping screw	Pan head 3x10 chromite
6	380649	Lift base	103	Tapping screw	Flat head 3x8 chromite
7	380650	Gear (large)			



## Drying Unit Ass'y, Lamp Cover Installation

1	112434	Lamp cover	101	Phillips head screw	Truss 4x16
2	112464	Drying unit Ass'y	102	Phillips head screw	Truss 4x6
3		Filter clamp	104	Phillips head screw	Pan head 3x8
4		Mogaru installation jig	105	Phillips head screw	Semus C 3x6
5	380653	Blinding light filter	201	Spring washer	4
6	850217	Lamp cover foot	202	Flat washer	3x6x0.5
301	Nut	4	203	Clip washer	4 inside teeth Ni-3



## **CALIBRATION PROCEDURE**

- 1. Calibration (Weight sensitivity adjustment)
  - 1 Install the breeze break and pan support. (sample pan is unnecessary.)
  - ② While pressing and holding the ▽ key, turn on the power switch.
  - (3) "BUSY" is displayed on the LCD. Continue to press and hold the key for several seconds longer. After a buzzer sounds and "CAL MODE vX.X" is displayed, release the key. The display changes to "REMOVE PLATE". "CAL ZERO PUSH KEY" is also displayed.
  - 4 Check that there is no sample pan on the instrument and press the TARE (or START) key.
  - (5) "PUT 100g PUSH KEY" is displayed.
    - \* If this message is not displayed, press the TARE key again. If the message is still not displayed, turn off the power switch and repeat operation from step(2) of item 1 above.
  - 6 Place a 100g calibration mass onto the sample pan support. Then press the TARE (or START) key. Several seconds later "CAL END" is displayed and the CAL mode ends.
    - \* If the display does not change, press the TARE (or START) key again. When the TIME, △ and ▽ keys are pressed, the CAL mode ends and "CAL ABEND" is displayed.
  - Next, the display changes to "SET PLATE". Remove the calibration mass and set the sample pan.
  - 8 When the START key is pressed, the display changes to "BUSY", then the temperature, timer setting, and sample are displayed. (Weight 0.00g)
  - Place a 50g calibration mass (Class 1) onto the sample pan. The display should read 50.00 ±0.01g. If it does not, repeat calibration.

### 2. Temperature sensor operation check

- Since the temperature, timer setting, and weight are displayed at step (8) of item 1, check if the temperature display is within ±2°C of the room temperature.
- Next install the lamp and set the timer to one minute and press the START key.
   At this time, slowly turn the temperature adjusting knob from 1 to 10 and check if the lamp brightness changes almost linearly.
  - \* The lamp brightness will vary somewhat at temperature adjusting knob 1. Check if the temperature display changes also.

### 3. Moisture display check

- 1) Similar to item 2, install the lamp and set the timer to one minute and place two 2g weights onto the sample pan and press the START key.
- After the lamp lights, remove one of the two weights and check that one minute later the lamp goes off and a buzzer sounds. Also check if the moisture display is 50.0 ±0.2%.



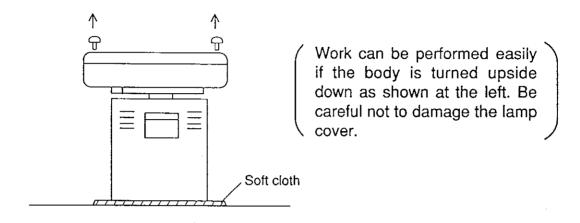
# TROUBLESHOOTING

Symptom	Cause
Power switch turned on, but "BUSY" not displayed.	Fuse     Power supply system faulty.     Internal connector contact faulty.
"BUSY" displayed, but does not advance.	<ol> <li>Motor faulty.</li> <li>Load cell system faulty.</li> <li>Calibration faulty.</li> <li>Reset circuit bug.</li> <li>Photointerrupter faulty.</li> </ol>
Lamp does not light.	Temperature setting knob set to MIN.     Lamp faulty.     Lamp control circuit faulty.
Moisture contents does not change.	1. Load cell faulty.
Set temperature not reached.	<ol> <li>Temperature sensor position faulty.</li> <li>Connector contact faulty.</li> <li>Temperature setting circuit faulty.</li> </ol>
Temperature unstable.	Temperature sensor open.     Temperature sensor installation faulty.     Temperature setting circuit faulty.

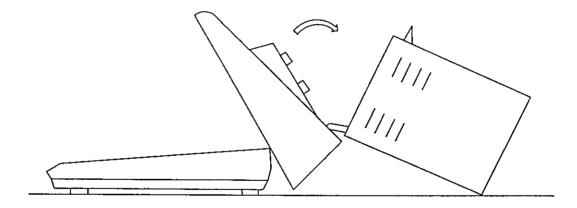
## ROM REPLACEMENT INSTRUCTIONS

Replace the old ROM as described below.

① Remove all the accessories (sample pan, pan support, breeze break, power cord) and remove the four body mounting screws.

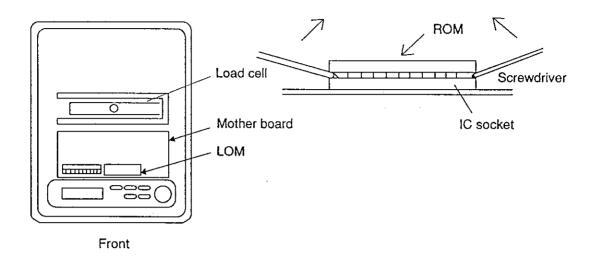


② Gently tilt the body upper case to the rear.

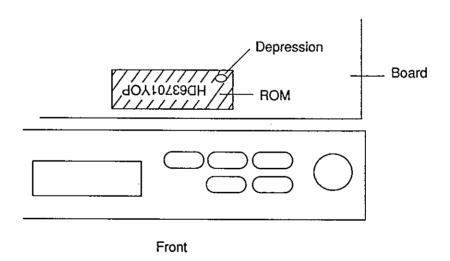


Because of the wiring, etc., the upper case can be opened to the rear only.

3 Remove the old ROM. The ROM is at the front of the mother board. This ROM has many pins. Therefore, pull it out carefully. Remove the ROM by prying it up alternately a little at a time with two flat blade screwdrivers.



4 After confirming the direction of the new ROM, insert it into the IC socket firmly. (Use the depression in the ROM as an indicator.)



- (5) Reassemble the case in the reverse order of opening. Be careful that the blind cover at the back of the case does not fall out.
- 6 Close the body upper case. At this time, be sure that the lead wires do not touch, or are not pinched by, the load cell.
- (7) Reassemble in the opposite order of opening. The above completes ROM replacement. Turn on the power switch and check if operation is normal.



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