

UB-328

UB-328A

MAINTENANCE MANUAL

DIGITAL BLOOD PRESSURE MONITOR

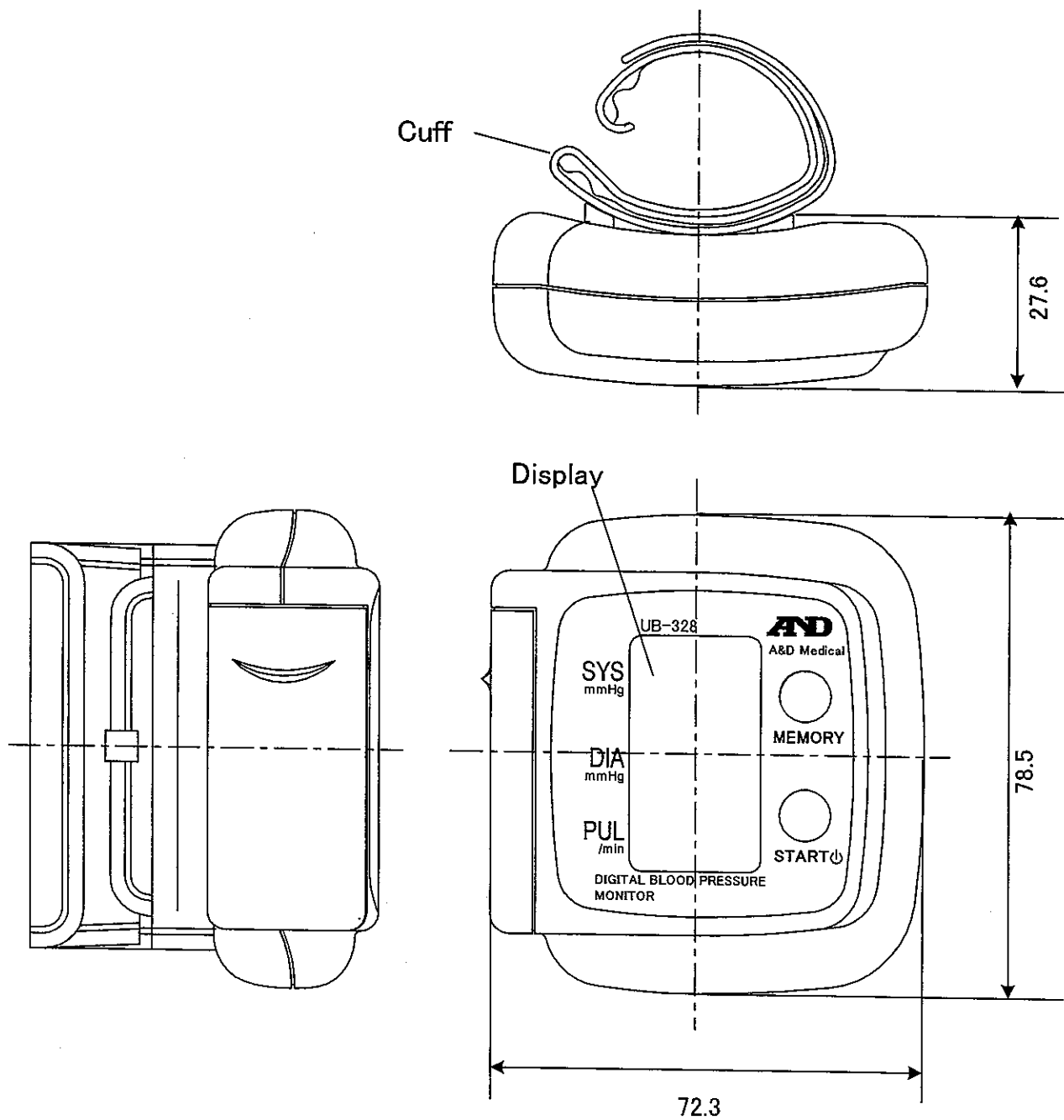
CONTENTS

1. SPECIFICATIONS.....	2
2. OUTLINE DRAWING.....	3
3. BLOCK DIAGRAM	4
4. TROUBLESHOOTING.....	5
TROUBLESHOOTING TABLE.....	6
5. REPAIRING PROCEDURE	7
6. PRESSURE ADJUSTMENT PROCEDURE	8-9
7. EXPLODED VIEW.....	10
8. PARTS LIST.....	11-12

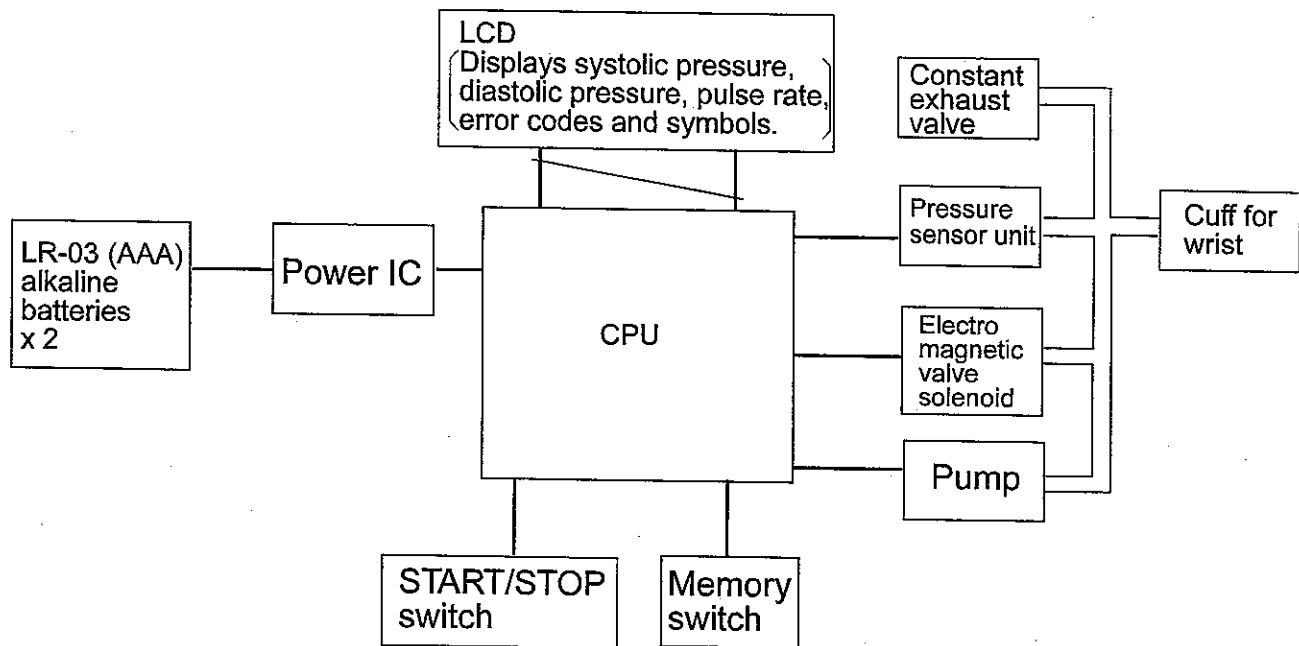
1. SPECIFICATIONS

1	Measurement Method	Oscillometric
2	Measurement Range	20~280 mmHg (Blood Pressure) 40~200 P/MIN. (Pulse)
3	Accuracy	Pressure ± 3 mmHg or 2% , Pulse $\pm 5\%$
4	Cuff Inflation	Micropump
5	Depressurization	Constant-air-release valve system
6	Pressurization	Automatic quick exhaust
7	Power Source	3VDC, 2 x 1.5V LR-03 (AAA) alkaline batteries
8	Battery Life	Approx. 300 times
9	Weight	Approx. 120 grams without batteries
10	Dimensions	73 (W) x 79 (D) x 58 (H) mm
12	Operating Environment	+10~+40°C (50~100° F) at 30--- 85% R.H.
13	Storage Environment	-10~+60°C (15~130° F) at 30--- 85% R.H.
14	Display	Liquid crystal type

2. OUTLINE DRAWING



3. BLOCK DIAGRAM



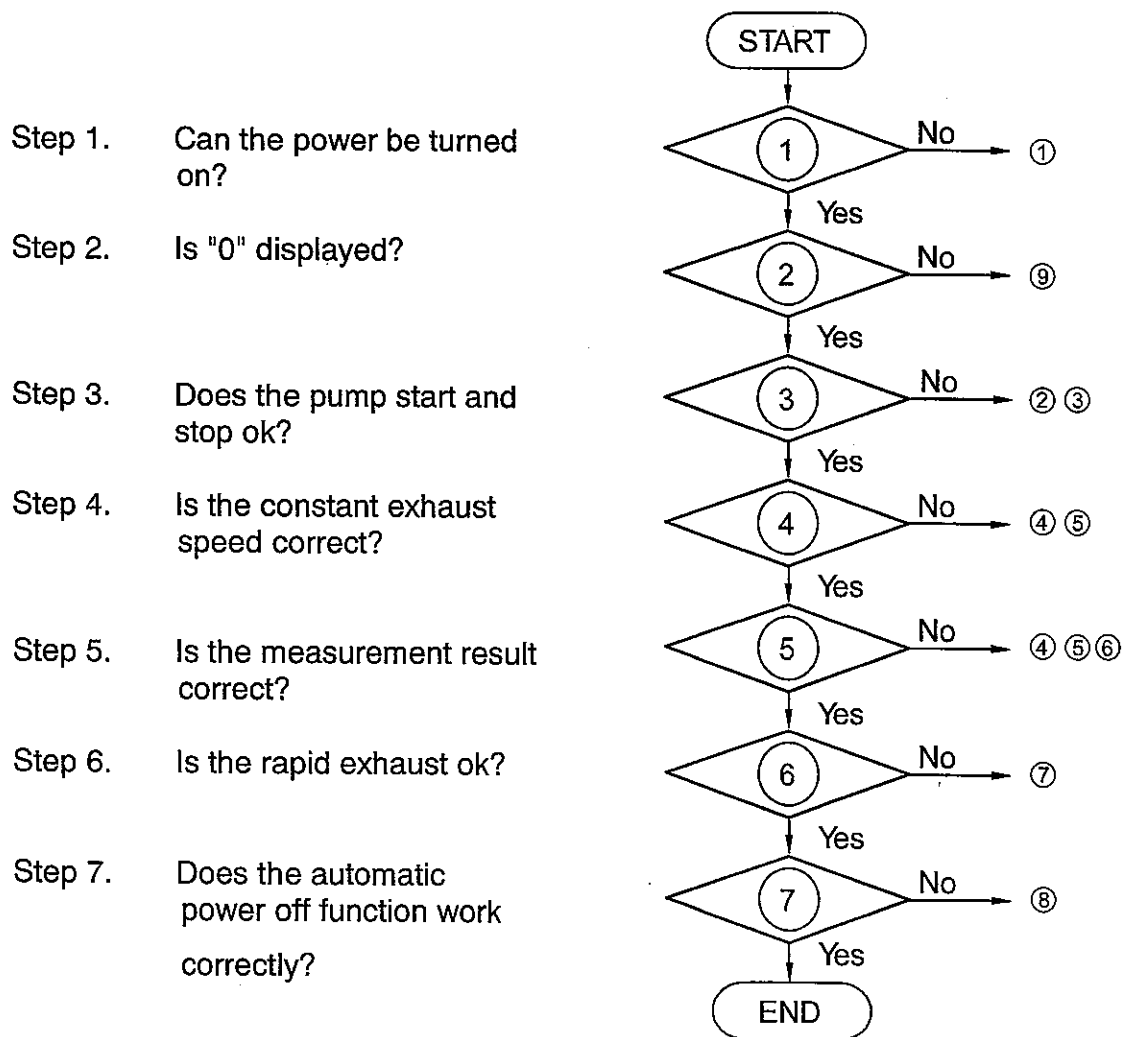
4. TROUBLESHOOTING

This section describes the symptoms, probable causes and solutions to problems. In the case of "can not measure" or "too much error", confirm that the measurement method is correct.

Pressure accuracy should be checked after repair. See "6. Pressure Adjustment Procedure"

Performance check chart

Check the symptoms against the flow chart and find the corresponding number circled on the right side of the chart. Then proceed to the troubleshooting table



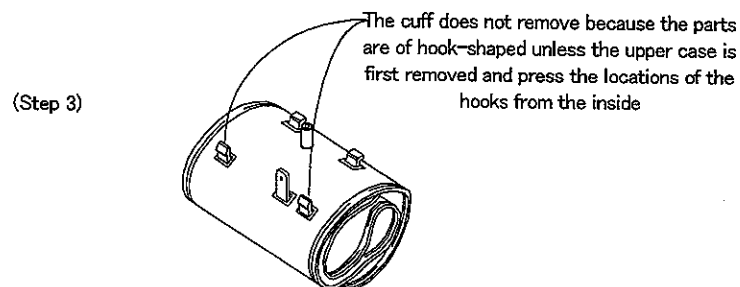
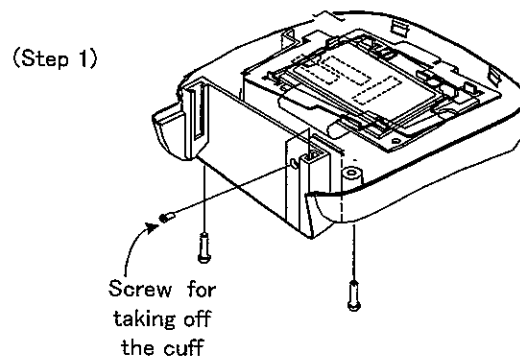
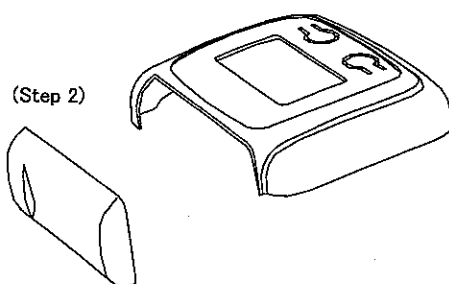
TROUBLESHOOTING TABLE

	Symptom	Probable Cause	Treatment
1	Power does not turn on.	Low battery	Replace the battery.
		Power lead is broken.	Resolder the leads.
		Main board may be defective.	Replace the main board and adjust the pressure reading.
2	Pump does not start.	Air pump is broken.	Replace the pump.
3	No inflation	Cuff leakage	Replace the cuff.
		Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Solenoid valve is defective.	Replace the solenoid valve ass'y.
4	Constant exhaust speed is too fast.	Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Tubing is broken.	Replace the tubing.
		Cuff is broken.	Replace the cuff.
5	Constant exhaust speed is too slow.	Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Tubing is pinched.	Replace the tubing.
6	Pressure reading is incorrect.	Pressure reading is adjusted incorrectly.	Readjust the pressure reading.
		Sensor board may be defective.	Replace the sensor board and adjust the pressure reading.
7	Rapid exhaust does not work.	Solenoid valve is defective.	Replace the solenoid valve ass'y.
		Tubing is pinched.	Replace the tubing.
8	Automatic power off function does not work.	Main board is defective.	Replace the main board.
9	Pressure sensor unstable.	Main board is defective.	Replace the main board.
		Pressure sensor is defective.	Replace the sensor board.

5. REPAIRING PROCEDURE

Upper case removal

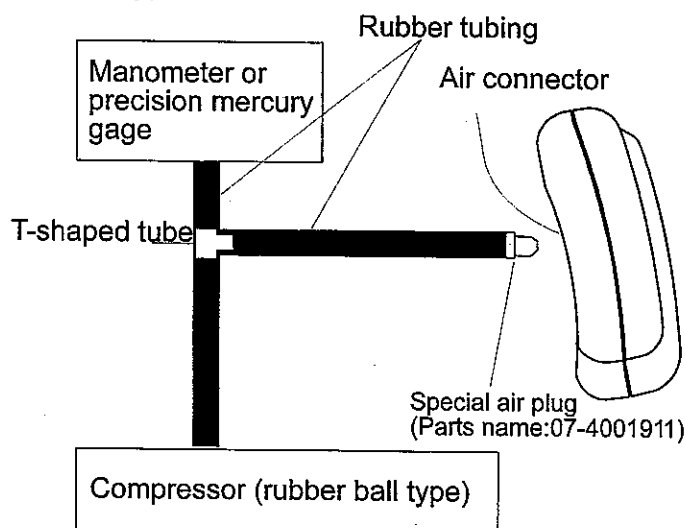
- Step 1. Remove two screws shown in the drawing.
- Step 2. Remove the upper case using caution not to damage the LCD.
- Step 3. Remove the cuff.



6. PRESSURE ADJUSTMENT PROCEDURE

Test equipment and tools required

- Low capacitance screwdriver
- Manometer or precision mercury pressure gage
- Compressor (rubber ball type)
- T-shaped tube
- Rubber tubing
- Forceps (or hose clamp)



Step 1. Remove the magic fastener, and remove the blind label.

Step 2. Enter the check mode.

<Entering the check mode>

Press the START button. When "0" (zero) appears, immediately supply air up to about 400 mmHg. When the display flashes "320", stop the air supply. Once the display returns to "0" (zero), supply 100 mmHg of air or more.

Step 3.

0
0
0

 is displayed on the LCD panel

Step 4. Increase the pressure to 280 mmHg by using the compressor. Use a precision manometer or mercury pressure gage to monitor the air pressure. When using a rubber bulb pump for inflation, close the rubber tube with forceps to maintain the pressure

Step 5. If the pressure reading is incorrect, remove the upper case as described in the repair procedure to provide access to the adjustment screw

Step 6. Under the following conditions:
Pressure value applied = A mmHg
Reading displayed = B mmHg
Remainder if A - B = C mmHg

Use the formula, $A \text{ mmHg} - B \text{ mmHg} = \pm C \text{ mmHg}$

When the result is $+C \text{ mmHg}$, turn the adjustment screw for a reading of $B - C \text{ mmHg}$

When the result is $-C \text{ mmHg}$, turn the adjustment screw for a reading of $B + C \text{ mmHg}$

Example: Pressure value applied = 280 mmHg
Reading displayed = 273 mmHg
 $280 \text{ mmHg} - 273 \text{ mmHg} = +7 \text{ mmHg}$
 $273 \text{ mmHg} - 7 \text{ mmHg} = 266 \text{ mmHg}$
Adjust the reading to 266 mmHg

Step 7. Reduce the pressure to zero and turn the power off (press the START switch).

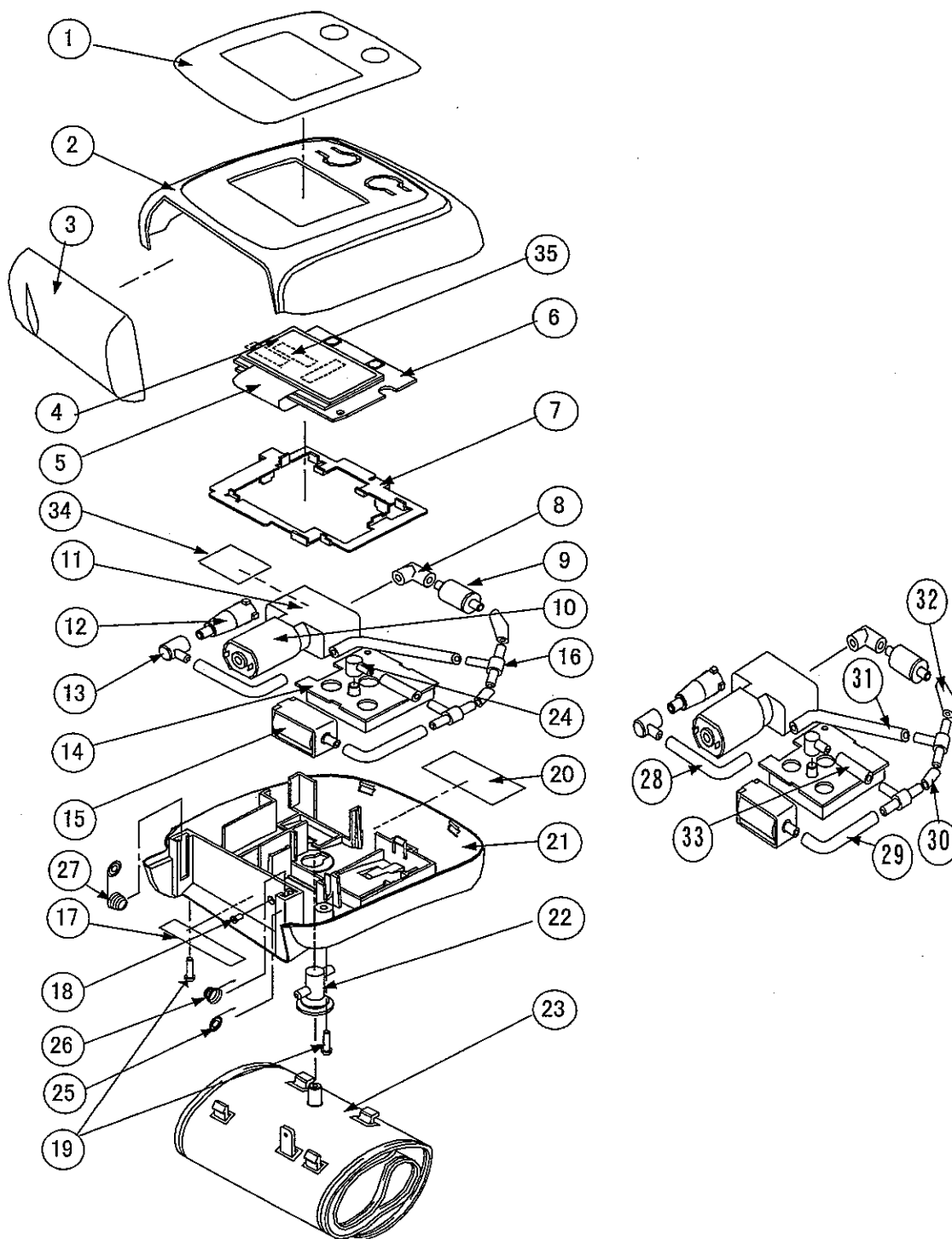
Step 8. Press the START switch to turn the power on again (zero is set when the power is first turned on). Enter the check mode.

Step 9. Increase the pressure to 280 mmHg by using the compressor and check the accuracy of the display.
When the correct reading is obtained, gradually reduce the pressure and confirm that the pressure readings at 150 mmHg and 50 mmHg are within $\pm 3 \text{ mmHg}$.

Step 10. Remove the special air plug and attach the cuff to the air connector.
Place the cuff on a plastic form about the size of a normal arm.
Press the START switch and pressurize the cuff to 160 mmHg.
Watch the display reading. The rate of pressure drop between readings should be about 3 mmHg.
If necessary, adjust the constant exhaust valve for 3 mmHg between readings.

Step 11. Reassemble the case and test the instrument again.

7. EXPLODED VIEW



8. PARTS LIST

No.	Parts number.	Description	Material
1	08:4010923	LCD Cover Panel	PET
2	07:2000621	Upper Case	ABS
3	07:4010856	Battery Cover	ABS
4	VL-BRJ001-TS	LCD	-
5	KH-22P100L015	Cable	-
6	PE-0194(UB-328) PE-0235(UB-328A)	PCB	-
7	04:3004828	Frame	SECC
8	07:4004530	Pump Connector	TPU
9	07:4010888	Straight Plug	ABS
10	06:4007955	Pump Cushion	CR
11	LM-MAP1002A	Pump	-
12	PA:4000159	Exhaust Valve	-
13	06:4006724	L Connector	TPU
14	PA:4000250	Sensor	-
15	LS-TDS-V05BL-SH	Release Valve	-
16	U4-1096	T-Connector	POM
17	08:4011414	Serial NO. Label	PAPER
18	17:14FB-P1.7X3	Screw P1.7X3	SWRCH (Fe)
19	UZ4-0031	Screw M2X8	SWRCH (Fe)
20	08:4010922	Rating Label	PET
21	07:2000622	Lower Case	ABS
22	06:4006623	Cuff Connector	TPU
23	13:3005078A	Cuff	-
24	06:4005410	Sensor Connector	PVC
25	15:4010870	Terminal (+)	SWP
26	15:4010871	Terminal (-)	SWP
27	15:1010872	Terminal (+,-)	SWP
28	16:4011754	Silicon Tube 2.3X04X40	Silicon
29	16:4011751	Silicon Tube 2.3X04X27	Silicon
30	16:4011749	Silicon Tube 2.3X04X15	Silicon
31	16:4011753	Silicon Tube 2.3X04X33	Silicon
32	16:4011752	Silicon Tube 2.3X04X29	Silicon

33	16:4011750	Silicon Tube 2.3X04X20	Silicon
34	06:4011496	Pump Cushion	CR
35	06:4005872	LCD Cushion	CR



A&D Company, Limited

3-23-14 Higashi-Ikebukuro, Toshima-ku, Tokyo 170-0013 JAPAN
Telephone: [81] (3) 5391-6132 Fax: [81] (3) 5391-6148