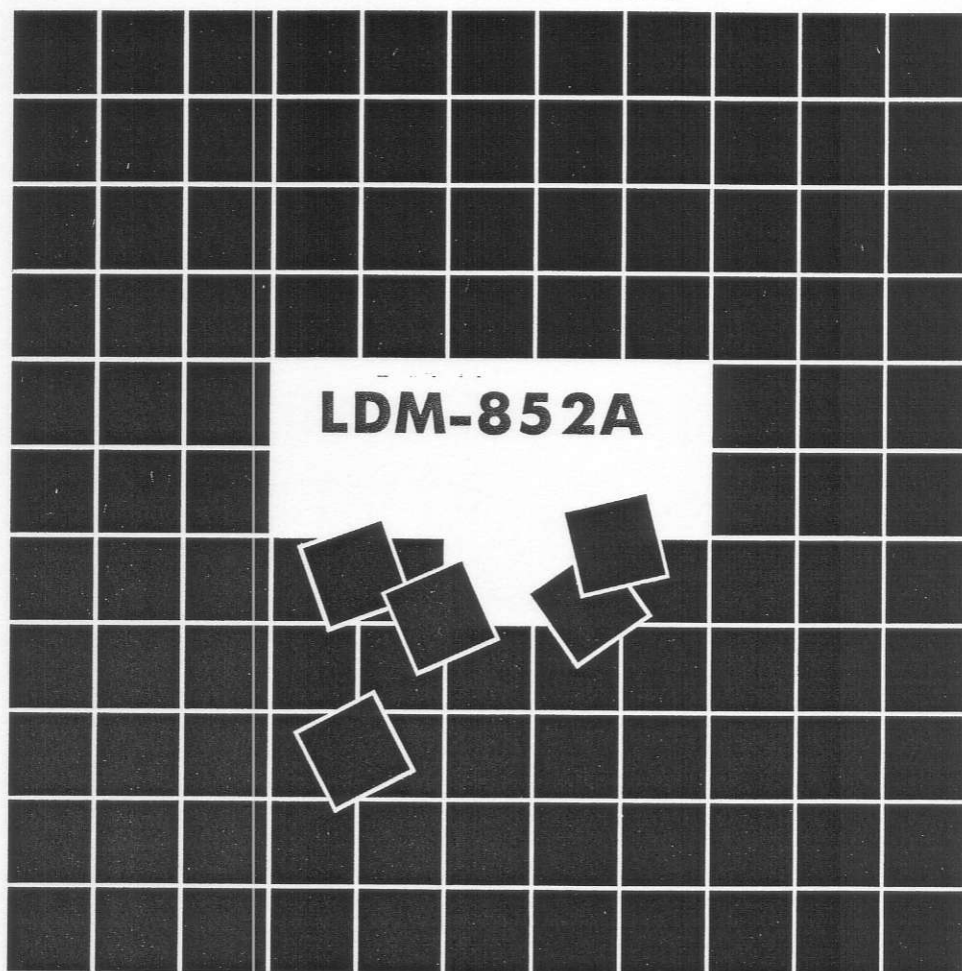


LEADER

DIGITAL MULTIMETER

INSTRUCTION MANUAL



LEADER ELECTRONICS CORP.

LDM-852A DIGITAL MULTIMETER INSTRUCTION MANUAL

	Page
TABLE OF CONTENTS	
1. INTRODUCTION	2
1.1 General Description	2
1.2 Features	2
2. SPECIFICATIONS	2
2.1 DC Voltage	2
2.2 AC Voltage	2
2.3 Resistance	3
2.4 DC Current	3
2.5 AC Current	3
2.6 General Specifications	4
3. DESCRIPTION OF PANELS	5
3.1 Front Panel	5
3.2 Rear Panel	6
4. OPERATIONS	6
4.1 Preperation and Precautions for Measuring	6
4.2 Measuring Procedures	7
5. FURTHER OPERATION AND MAINTENANCE PROCEDURES	9
5.1 Tilt Handle	9
5.2 How to remove the Case	10
5.3 Maintenance	10

1. INTRODUCTION

1.1 General Description

The LDM-852A is a 4-1/2 digit bench type full scale multimeter capable of measuring DC/AC voltage/current and resistance in 24 ranges, equipped with the automatic polarity switching function, featuring a large LED (green) display.

1.2 Features

- High accuracy (2V range 0.03% reading ± 2 digit), high resolution (200mV range in DC/AC, 200 Ω range in resistance),

capable of measuring large current (2A in DC/AC).

- Low/high resistance range selecting type. Buzzer continuity check is possible in 200 Ω and 2 k Ω ranges at High Ω (with the buzzer ON-OFF function).
- Large size LED (green) display easy to look at.
- DC/AC 200 mV and 2 V input impedance as high as 500 M Ω .

2. SPECIFICATIONS

2.1 DC Voltage

Range	Accuracy	Resolution	Input Impedance	Max. Input Voltage
0.2V	±0.04% rdg ±2dgt	0.01mV	Approx. 500 MΩ	1100 V DC Peak
2V	±0.03% rdg ±2dgt	0.1mV		
20V	±0.04% rdg ±2dgt	1mV	Approx. 10 MΩ	
200V	±0.04% rdg ±2dgt	10mV		
1000V	±0.04% rdg ±2dgt	100mV		

2.2 AC Voltage

Range	Accuracy	Frequency	Resolution	Input Impedance	Max. Input Voltage
0.2V	$\pm 0.4\% \text{rdg} \pm 10 \text{dgt}$ $\pm 1.5\% \text{rdg} \pm 20 \text{dgt}$	40Hz—1kHz 1kHz—5kHz	0.01mV	Approx. 500 M Ω Input capaci- tance 100pF	AC 1100 V DC 1100 V
2V	$\pm 0.3\% \text{rdg} \pm 10 \text{dgt}$ $\pm 1.5\% \text{rdg} \pm 20 \text{dgt}$	40Hz—1kHz 1kHz—5kHz	0.1mV		
20V	$\pm 0.4\% \text{rdg} \pm 10 \text{dgt}$ $\pm 2.5\% \text{rdg} \pm 20 \text{dgt}$	40Hz—1kHz 1kHz—5kHz	1mV	Approx. 10M Ω Input capaci- tance 100pF	
200V	$\pm 0.4\% \text{rdg} \pm 10 \text{dgt}$	40Hz—1kHz	10mV		
1000V	$\pm 0.5\% \text{rdg} \pm 10 \text{dgt}$	40Hz—500Hz	100mV		

2.3 Resistance (HI) (Open-circuit measuring voltage is less than 5.0V.)

Range	Accuracy	Resolution	Measuring Current	Max. Input Voltage
200Ω	±0.04%rdg ±4dgt	10mΩ	1mA	250 V AC/DC
2kΩ	±0.03%rdg ±4dgt	100mΩ	1mA	
20kΩ	±0.03%rdg ±4dgt	1Ω	100μA	
200kΩ	±0.03%rdg ±4dgt	10Ω	10μA	
2000kΩ	±0.2%rdg ±2dgt	100Ω	1μA	
20MΩ	±1%rdg ±2dgt	1kΩ	0.1μA	

Resistance (LO) (Open-circuit measuring voltage is less than 0.5V.
In the 200Ω range, however, it is less than 5.0 V.)

Range	Accuracy	Resolution	Measuring Current	Max. Input Voltage
200Ω	±0.15%rdg ±2dgt	10mΩ	1mA	250 V AC/DC
2kΩ	±0.15%rdg ±2dgt	100mΩ	100μA	
20kΩ	±0.15%rdg ±2dgt	1Ω	10μA	
200kΩ	±0.15%rdg ±2dgt	10Ω	1μA	
2000kΩ	±0.5%rdg ±2dgt	100Ω	0.1μA	
20MΩ	±1.5%rdg ±2dgt	1kΩ	0.01μA	

Accuracy at 200Ω & 2kΩ ranges shows after 0Ω adjustment.

2.4 DC Current

Range	Accuracy	Resolution	Internal Resistance	Max. Input Current
2mA	±0.4%rdg ±2dgt	10μA	100Ω	2A
20mA	±0.4%rdg ±2dgt	100μA	10Ω	
200mA	±0.8%rdg ±2dgt	1mA	1Ω	
2000mA	±0.8%rdg ±2dgt	10mA	0.1Ω	

2.5 AC Current

Range	Accuracy	Frequency	Resolution	Internal Resistance	Max. Input Current
2mA	±0.6%rdg±10dgt	40Hz–1kHz	10μA	100Ω	2A
20mA	±0.6%rdg±10dgt	40Hz–1kHz	100μA	10Ω	
200mA	±1%rdg±10dgt	40Hz–1kHz	1mA	1Ω	
2000mA	±1%rdg±10dgt	40Hz–1kHz	10mA	0.1Ω	

2.6 General Specifications

Max. Display Digits	19999 (4½ digits)
Display Element	Green LED (Character size of figures 14 mm)
Range Switching	Manual
	DC/AC V ; 5 ranges
	DC/AC A ; 4 ranges
	OHMs ; 6 ranges
Overrange Indication	Display 0000 and flashing
Polarity	Automatic (" - " indicates negative polarity)
Sample Rate	2.5 times per second
Continuity Check	
Range	HI 200 Ω and 2 k Ω
Electric Buzzer	Beep within 2 $\Omega \pm 1 \Omega$
Open Terminal Voltage	Less than 5.0 V
ON-OFF Switch	On rear panel
Diode Check	
Range	HI 2 k Ω
Measuring Current	1 mA
Measuring Voltage	0 - 1.9999 mV
Accuracy	0.5% rdg \pm 2 dgt
Open Terminal Voltage	Less than 5.0 V
0 Ω ADJ in measuring resistance	Manual, 200 Ω and 2 k Ω
Operating Temperature and Humidity	
Temperature	0°C ~ 40°C
Humidity	Less than 80% RH (When there is no condensation)
Precision Temperature and Humidity	23°C \pm 5°C, less than 80%RH
Storage Temperature	-20°C ~ 60°C
Overcurrent Protector	Internal fuse
Withstand Voltage	AC 1.5 kV, 1 minute
GPIB Connector Bus	Option
Power Requirements	
Line Voltage	AC 100, 120, 230 V, 50/60 Hz
Power Consumption	5 VA
Size	211(W) x 80(H) x 265(D) mm
Weight	Approx. 2.2 kg
Accessories	Test leads 1 2A fuse 1 0.1A fuse 1

3. DESCRIPTION OF PANELS

3.1 Front Panel

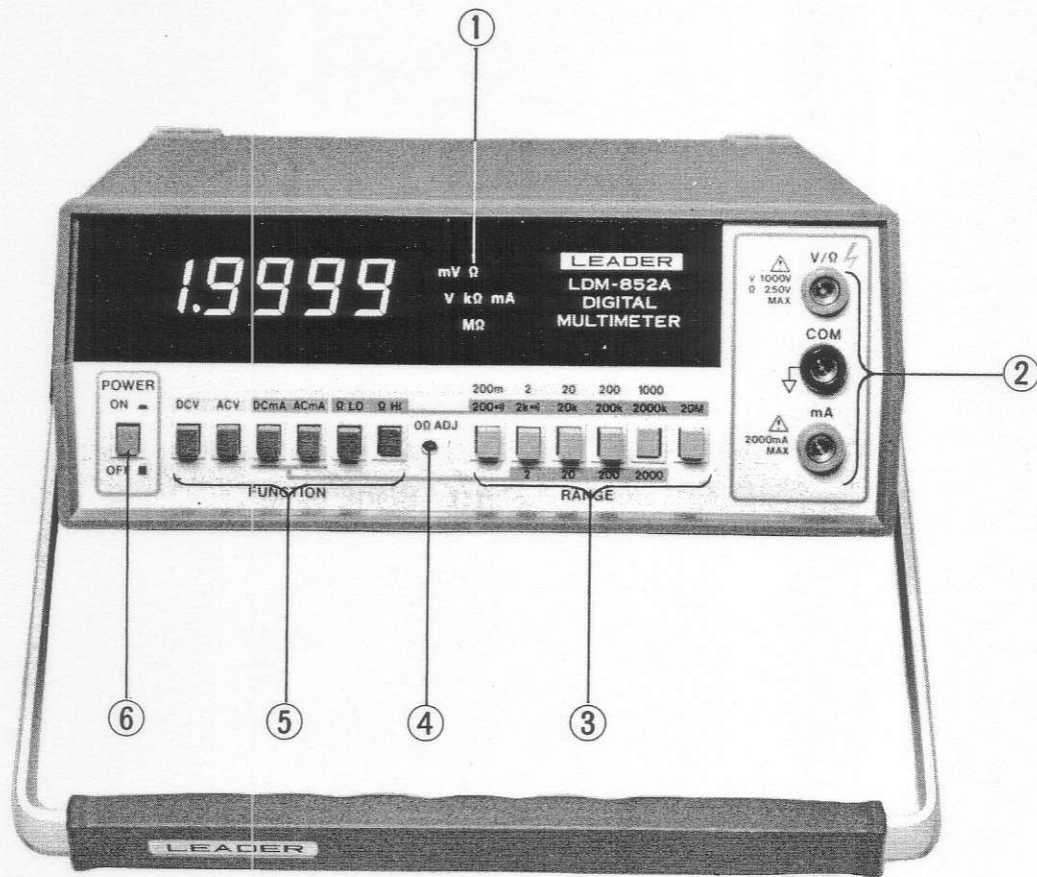


Fig. 3-1. Front Panel

- ① mV, V, Ω , k Ω , M Ω , mA: Unit Display. The unit corresponding to the selected RANGE ③ – ⑤ will be displayed.
- ② V/ Ω , COM, mA: Input Terminals for Measuring. The terminals is to be selected according to the measuring function. mA is the terminal for current measurement. V/ Ω is the terminal for voltage/resistance measurement and COM is the common ground terminal for all measurements.
- ③ RANGE: Range switch. This is selected according to the measuring value.
 For voltage measurement
 0.2, 2, 20, 200, 1000.
 For current measurement
 2, 20, 200, 2000.
 For resistance measurement
 200, 2k, 20k, 200k, 2000k, 20M
- ④ 0 Ω ADJ: In measuring resistance, it is measured after initial resistance, including cable, is calibrated (adjusted) to 0 Ω .
- ⑤ FUNCTION: Function switches are provided to select the following functions:
 DC voltage measurement: DC V
 AC voltage measurement: AC V
 DC current measurement: DC mA
 AC current measurement: AC mA
 Resistance measurement: Ω HI or Ω LO
- ⑥ POWER ON: Power switch. When switched on, the LED indicator will light.

3.2 Rear Panel

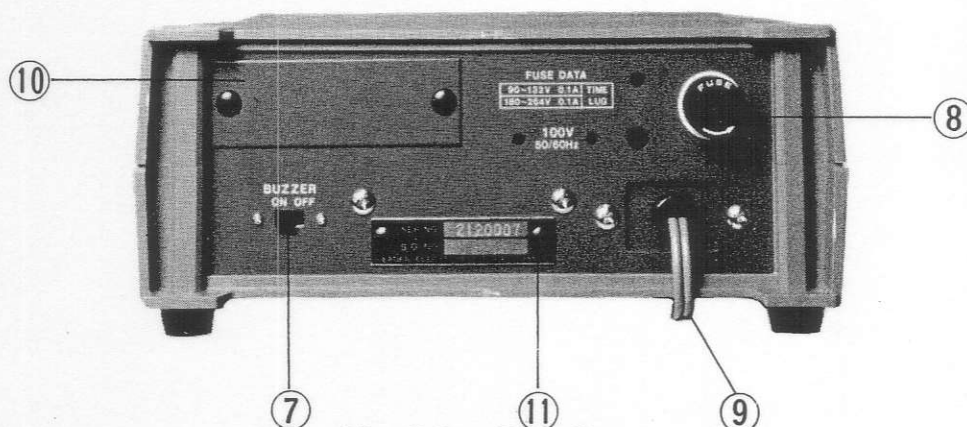


Fig. 3-2. Rear Panel

- | | |
|-----------------------------------------------------------------------|------------------------|
| ⑦ BUZZER ON-OFF switch: Used for continuity check. | ⑨ AC Cord: power cord. |
| ⑧ FUSE: Fuse holder for safety fuse for AC primary side power supply. | ⑩ Blank panel |
| | ⑪ Serial number plate |

4. OPERATIONS

4.1 Preparation and Precautions for measuring

(1) Input Power

Use input power within the range of rated voltage $\pm 10\%$ and 48 to 62Hz. Note the voltage range and fuse rating shown on the rear panel of the LDM-852A. The power transformer is provided with 100V, 120V and 230V series winding taps. Use this multimeter within the range of working voltage shown Fig. 4-1 by changing these taps.

(2) Use power supply within the specified range.

In connecting power, confirm that the POWER switch is OFF and then, connect to the receptacle.

(3) Since the input terminals are separately provided for voltage/resistance measurement and current measurement, confirm that the measuring lead is connected correctly.

Voltage/resistance measurement . . . V/ Ω terminal and COM terminal

Current measurement . . . mA terminal and COM terminal

(4) Take note that a maximum applied voltage is prescribed for each input terminal depending on the measuring function.

(5) When the function switch is set on a switch other than OHM, and the range switch is on 20 M Ω , measuring is not possible. Only one switch each of the function and range switches can be used at the same time.

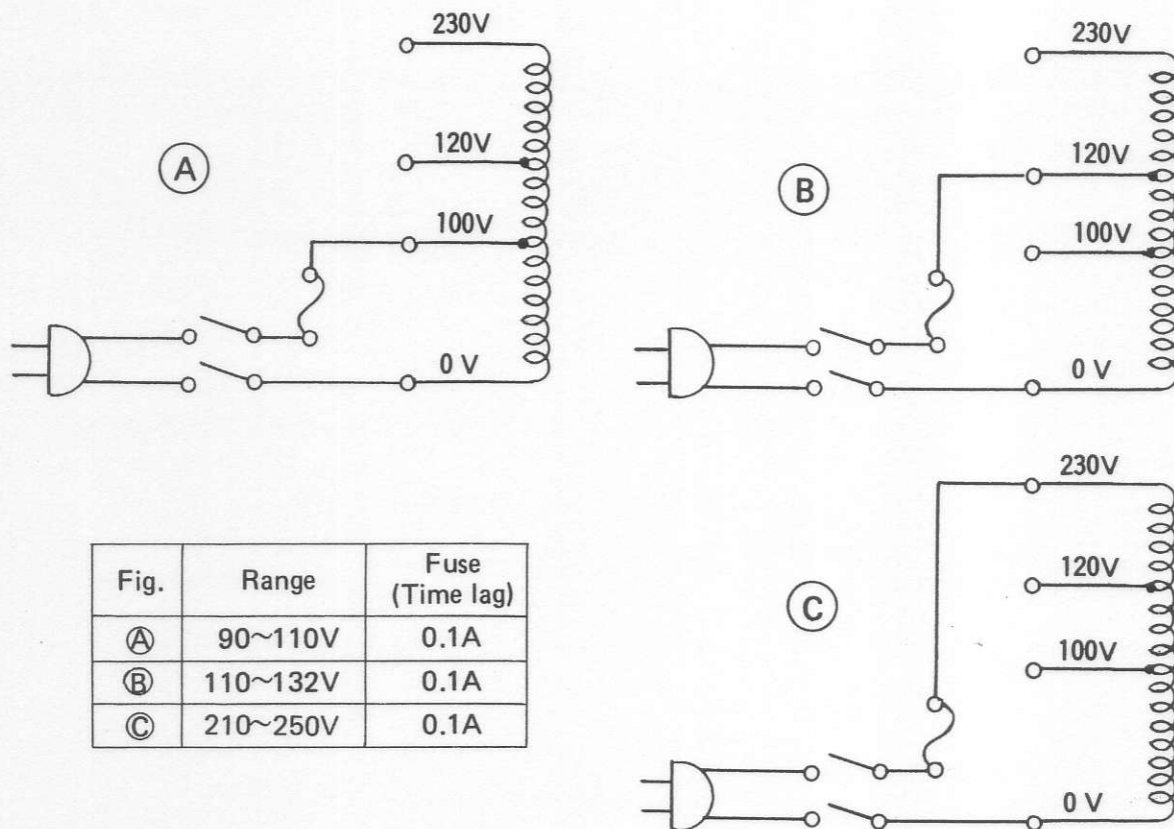


Fig. 4-1.

- (6) In measuring resistance, accuracy of low resistance measurement can be improved when resistance of the test lead is cancelled. To do this, short the measuring lead and set the indication to 0000 by rotating 0Ω ADJ with a screw-driver. Measure resistances at the range of 200 and 2k.
- (7) Fuse for over-current protection: If the fuse is burned out by measuring current, the current cannot be measured. In this case, remove the load circuit to be measured and turn power off, remove AC cord from the power supply, remove the cabinet and replace the 2A fuse with new one. For replacement of the fuse, refer to "5.2 How to remove the case" and "5.3. (3) Replacement of fuse". A normal fuse 2A should be used. (One spare fuse is provided as an accessory.)
- (8) The operating temperature range for the LDM-852A is between 0°C and 40°C and therefore care should be taken to keep the environment within this range.
- (9) Function and range: As shown by color code on the panel, color coded range only can be functioned as the range function. Measurement cannot be made by pushing 20M range at DCV/ACV function. In this case, the unit indication disappears. When the unit indication is disappeared, the range selection is made in error and so the range which can be displayed should be used.

4.2 Measuring Procedures

The measuring procedures are as follows:

- Turn on power switch ⑥.
- Push the function switch corresponding to the function to be measured.

DC voltage	DC V
AC voltage	AC V
DC current	DC mA
AC current	AC mA
Resistance	Ω LO or Ω HI
- Set the correct range switch according to the measuring value.

Voltage measurement	200m, 2, 20, 200, 2000
---------------------	------------------------

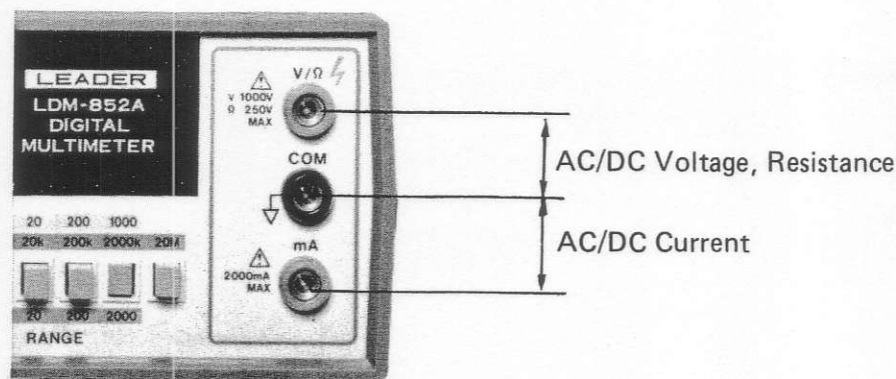


Fig. 4-2. Test Leads Connections

Resistance measurement

200, 2k, 20k, 200k, 2000k, 20M

Current measurement

2, 20, 200, 2000

If the measuring value is unknown, set the range at large value as possible.

- (4) Connect the test lead to the input terminal corresponding to the function to be measured. See Fig. 4-2.

For measuring voltage and resistance:

Connect the red lead to the V/Ω terminal and the black lead to the COM terminal.

For measuring current:

Connect the red lead to mA terminal and the black lead to the COM terminal.

- (5) Precautions when measuring AC voltage and AC current.

When measuring AC voltage and AC current, especially when the signal is small, outside noise may interfere with the measuring, and therefore the red and black leads should be twisted at the time of measurement.

- (6) Connect the test lead to the point of measurement.

However, attention should be paid to the rated maximum input applicable to each terminal as given here below:

- (7) Read the display. The unit of the displayed value is indicated by the unit indicator lamp.

A. When the maximum digit of "1" flashes on the display, it shows over input and the range switch should immediately be set at a higher range. However, in cases of resistance being measured, apart from the above-mentioned situations, the following situations may be the cause.

a) The test lead may not be properly connected to the measuring point.

b) The object being measured may be "open".

B. Positive (+) polarity is not displayed when the DC voltage and DC current are measured, but when negative (—), it is indicated by "—".

C. When the display is 1999 or less, more detailed display can be obtained by switching to a step lower. The LDM-852A can display maximum 19999 or 4½ digits and it is desirable that all digits are utilized as effectively as possible.

Function	Between V/Ω and COM Terminals	Between mA and COM Terminals
DC V	1100 V AC/DC 1 minute	2A
AC V	1100 V AC, 500 V DC 1 minute	
DC mA	250 V AC/DC 1 minute	
AC mA	250 V AC/DC 1 minute	
Ω	250 V AC/DC 1 minute	

- (8) Continuity check by buzzer sound
- Set the ON-OFF switch ⑦ on the rear panel at the ON side.
 - Set the function switch at Ω HI and set the range switch at 200Ω or $2\text{ k}\Omega$.
 - Connect the test lead between the V/ Ω and COM terminals and connect its end to the measuring point. When measured resistance is less than about 2Ω , the buzzer sounds to indicate continuity.
 - If this continuity sound is not necessary in measuring resistance, the buzzer does not sound when the ON-OFF switch ⑦ is set at the OFF position.
- (9) Diode check
- A diode can be checked using the resistance measuring range of Ω HI and $2\text{ k}\Omega$. Measuring current in this case is constant current and 1 mA flows from the V/ Ω terminal to the COM terminal.

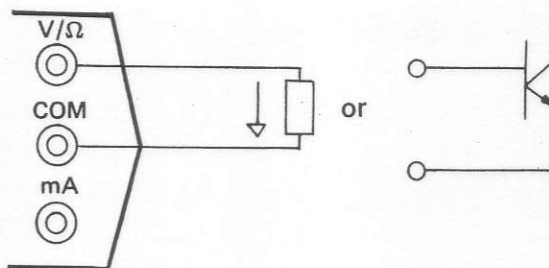


Fig. 5-3. Example of Connection for Diode Check

- When a diode is connected as illustrated in Fig. 5-3, ON voltage of the diode, i.e., forward voltage V_F is measured. Unit of reading is "V".
- Caution: In the case of Ω LO, terminal voltage for $2\text{ k}\Omega$ to $20\text{ M}\Omega$ is 0.5V and the diode does not go ON. So, it can be used for measuring in-circuit resistance.

5. FURTHER OPERATION AND MAINTENANCE PROCEDURES

5.1 Tilt Handle

For carrying convenience, a tilt handle is attached. It should be used as follows:

(1) Change of angle

Push the handle axis on both sides to unlock the handle which will then be free to rotate. Fix it at the most convenient position.

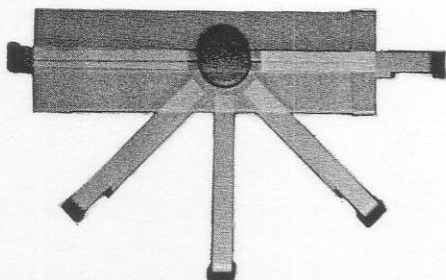


Fig. 5-1. Change of Angle

- The handle rotates 360° and it can be placed as shown in Fig. 5-2 when it gets in the way, for instance, at times when it becomes necessary to pile on top of the apparatus, etc.



Fig. 5-2.

5.2 How to remove the case

- (1) Turn the apparatus up side down and unscrew the 4 feet.
- (2) Turn the apparatus back to normal position.
- (3) Lift the lid of the case carefully.

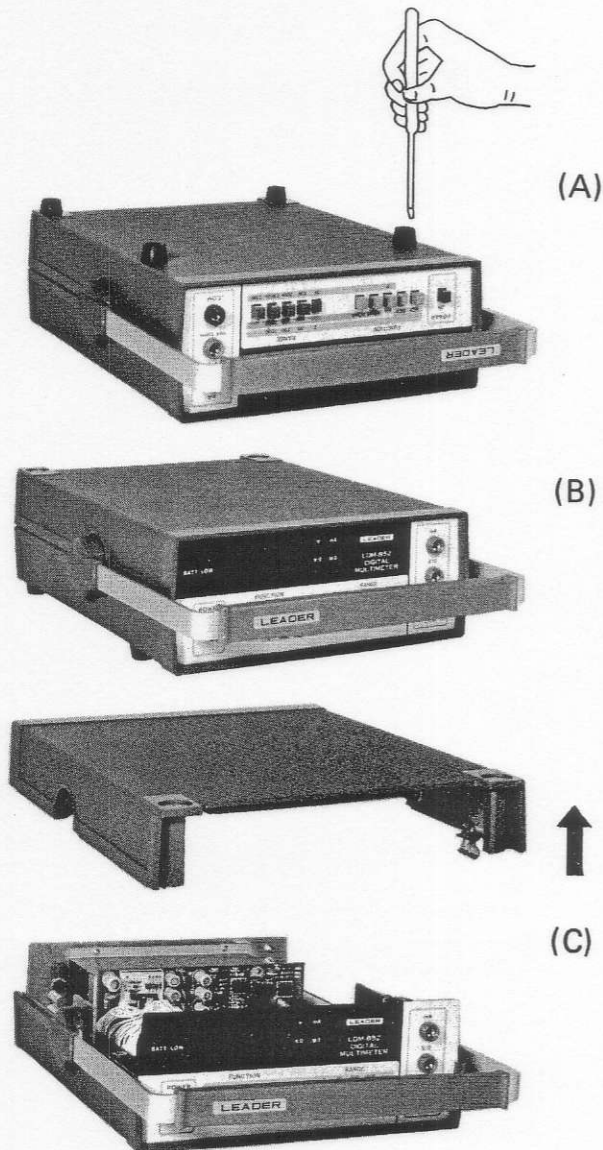


Fig. 5-3. How to remove the Case

5.3 Maintenance

- (1) When the case becomes dirty, wipe off by a soft cloth with a little water. Do not use such solvents as alcohol, benzine, thinner, etc. as they can dissolve the coating of the case of plastic parts.
- (2) When not used, store the LDM-852A avoiding high temperature, humid and dusty places.
- (3) Replacement of fuse: A fuse 2A is installed in series at mA terminal for protection of current range. When the current cannot be measured for over-current, the fuse is turned off and so should be replaced with new fuse. Please replace the fuse located at the input terminal of the printed circuit board for LED in the rear of front panel as shown in the picture.

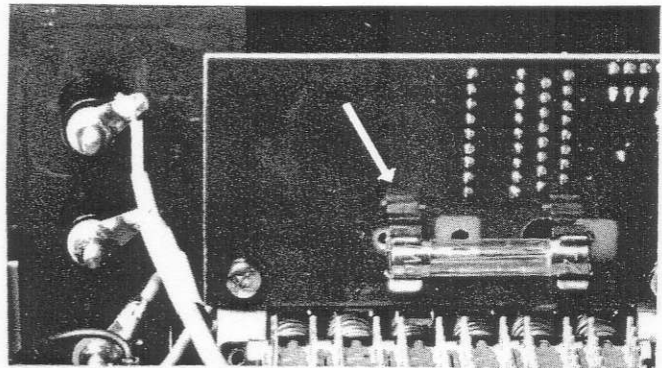


Fig. 5-4. The Place of a 2A Fuse

MEMO



LEADER ELECTRONICS CORP.

2-6-33 TSUNASHIMA-HIGASHI, KOHOKU-KU, YOKOHAMA, JAPAN.

PHONE:(045)541-2123

FAX:(045)544-1280 TELEX:J47780 JPLEADER

LEADER INSTRUMENTS CORP.

380 OSER AVENUE, HAUPPAUGE, N. Y. 11788 U. S. A.

PHONE:(516)231-6900

TELEX:510-227-9669 LEADER HAUP

FAX:516-231-5295

付属ヒューズについての お知らせ

取扱説明書に、付属品としてスペアヒューズが記載されておりますが、ご購入頂きました製品には付属しておりません。

ヒューズについてのお問い合わせは、本社またはお近くの営業所へご連絡をお願いいたします。

リーダー電子株式会社

制作日：2002年(平成14年)7月1日

FUSE Corrigenda

Notes on Fuse

The spare fuse listed as a standard accessory in this instruction manual is not supplied for this product.

Contact your local Leader agent for the fuse.

LEADER ELECTRONICS CORP.

Date : July 1, 2002

Printed in Japan