



## EXPLANATION OF FUNCTION KEYS

**ON** : Power ON key

**OFF** : Power OFF key

**0 - 9** : Numerical key

**.** : Decimal point key

**START** : Start measurement

**HOLD** : Temporarily put measurement on hold

**MEMO** : Ending measurement and memory

**AVER** : Calculate average value

**UNIT-1** : Unit system selection key

**UNIT-2** : Unit selection key within each unit system

**SCALE** : Scale setting key

**R-S** : not applicable to this model

**C/AC** : Clear key (to erase memory and measured values)

## POWER SUPPLY

This instrument supports both AC and DC power supply methods.

### (1) DC Power Supply

This instrument contains a built-in Ni-CD storage battery in the main body. Normally, the battery can be used for up to 30 hours continuously. When the battery voltage is reduced, "Batt-E" symbol appears.

### (2) AC Power Supply

This instrument can be used directly on AC power supply, using the special AC adaptor.

### (3) Auto-Power Off Function

About 5 minutes

### (4) Function of Keeping the Scale and Unit System

Even when power is turned off, the scale and unit system is stored in memory. If power is turned on again, previously set scale and units can be used for measurement.

## MEASUREMENT METHOD

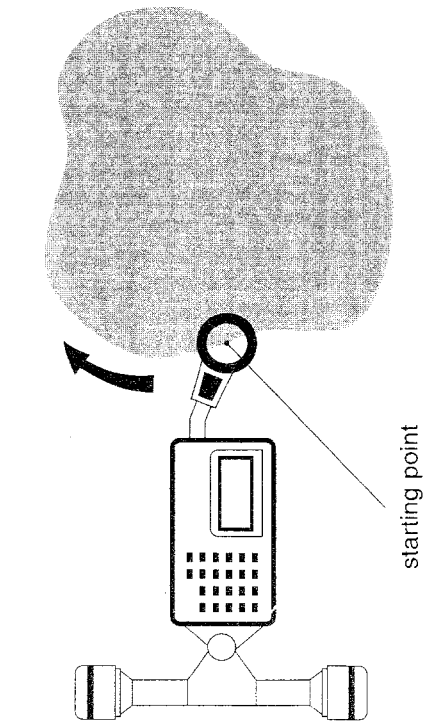
Please read desired sections from the menu below.

Taking measurement	Chapter 1
Normal pattern	1-1
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To select units	Chapter 2
To set scale	Chapter 3
To calculate average values	Chapter 4

Make sure to read the notes written at the end of each chapter.

## CHAPTER 1 TAKING MEASUREMENT

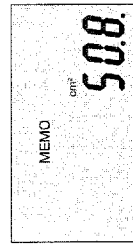
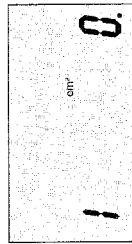
### 1-1 NORMAL PATTERN



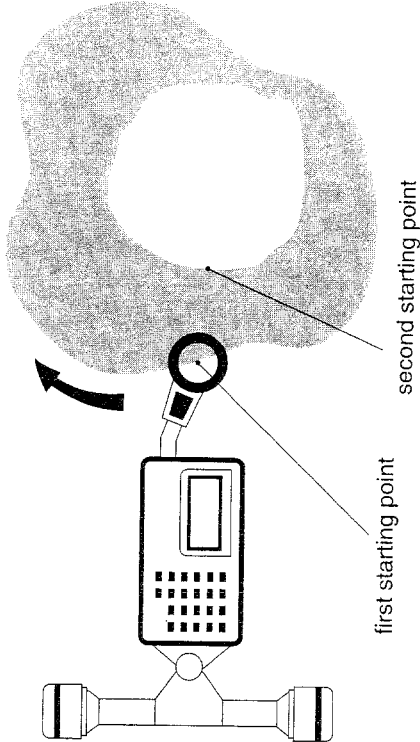
1. Put a mark at a point on the circumference of the drawing to be measured.

This point will be the starting point of the measurement. Set the center of the tracer lens to match the starting point as shown in the figure above.

2. Press **START** key. A buzzer sounds, and "0" is displayed. The number of measurements is displayed on the left edge.
3. Keeping the tracer point of the tracer lens onto the circumference line, trace **clockwise**.
4. After going round, press **MEMO** key. Measurement is finished. A buzzer sounds, "MEMO" is displayed and the measured area value is displayed.



### 1-2 DONUT PATTERN

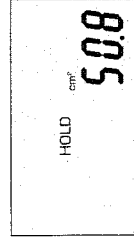
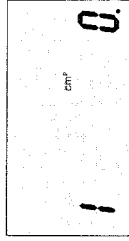


1. Put a mark at a point on the circumference of the drawing to be measured. This point will be the starting point of the measurement. Put another point on the internal circumference. This point will be the starting point for the internal circumference measurement. Set the center of the tracer lens to match the external circumference starting point as shown in the figure above.

2. Press **START** key. A buzzer sounds, and "0" is displayed. The number of measurements is displayed on the left edge.

3. Keeping the tracer point of the tracer lens onto the circumference line, trace **clockwise**.

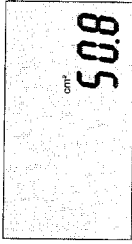
4. After going round, press **HOLD** key. Measurement stops temporarily. "HOLD" is displayed and the measured value is fixed.



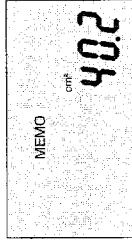
5. Set the center of the tracer lens to match the internal circumference starting point as shown in the figure.



6. Press **HOLD** key. The HOLD condition is released and "HOLD" disappears from display.

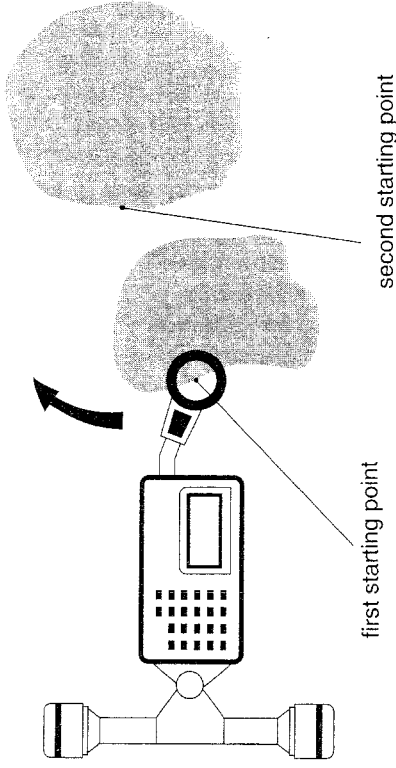


7. Keeping the tracer point of the tracer lens onto the internal circumference line, trace **anticlockwise**.



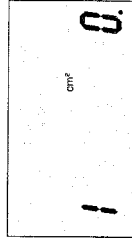
8. After going round, press **MEMO** key. Measurement stops. A buzzer sounds, "MEMO" is displayed and the measured value is displayed.

### 1-3 TWO DRAWINGS ARE SEPARATED



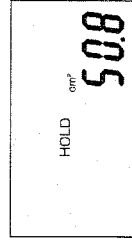
1. Put a mark at a point on the circumference of the first drawing to be measured. This point will be the starting point of the measurement for this drawing. Put another point on the circumference of the second drawing. This point will be the starting point for the measurement of this drawing. Set the center of the tracer lens to match the circumference starting point as shown in the figure above.

2. Press **START** key. A buzzer sounds, and "0" is displayed. The number of measurements is displayed on the left edge.



3. Keeping the tracer point of the tracer lens onto the circumference line, trace **clockwise**.

4. After going round, press **HOLD** key. Measurement stops temporarily. "HOLD" is displayed and the measured value is fixed.



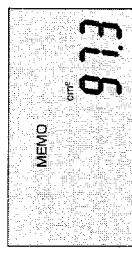
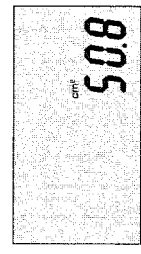


5. Set the center of the tracer lens to match the starting point on the second drawing as shown in the figure.

6. Press **HOLD** key. Measurement restarts "HOLD" disappears from display.

7. Keeping the tracer point of the tracer lens onto the circumference line, trace the second drawing **clockwise**.

8. After going round, press **MEMO** key. Measurement stops. A buzzer sounds, "MEMO" is displayed and the measured value is displayed.



**NOTE**

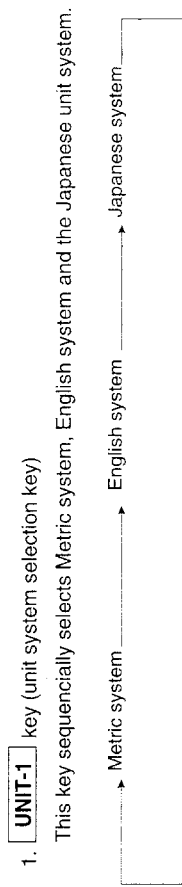
If a mistake occurs during tracing, once again, set the tracer lens to match the starting point. Press **START** key and redo measurement.

If the measured value is over (99999999 and above) or under (0.0000001 and below) the unit is automatically adjusted to a value that can be displayed. If display is not possible even in this case, the scale will become 1:1.

The maximum number of measurements is 10 times. At the 11th time, all values in memory are cleared. Measurement starts from 1st.

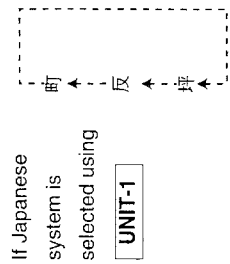
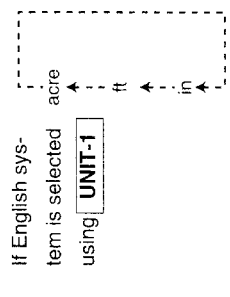
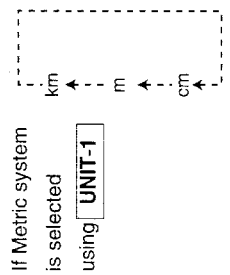
**CHAPTER 2 SELECTION OF UNITS**

Units can be selected from the Metric system (cm, m, km) or English system (in, ft, acre) or the Japanese unit system (坪, 反, 町)



2. **UNIT-2** key (unit shifting key within each unit system)

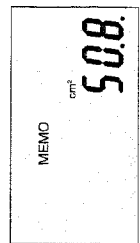
If the unit system has been decided, it is possible to make selections by pressing **UNIT-2** key as below



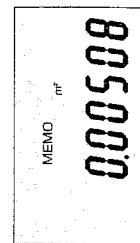
**CAUTION**

• If the unit changes, measured value is re-calculated to reflect the change.

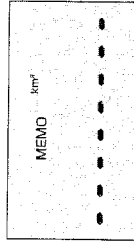
[Example]  
In this example cm<sup>2</sup> is selected.



If m<sup>2</sup> is selected by pressing **UNIT-2** key, the display will change as in the figure on the right.



- If due to change in unit system, the calculated value goes over (99999999 and above) or under (0.00000001 and below). The display will show as in the figure on the right.



**NOTE**

Using Auto power off, or even if the **OFF** key is pressed to turn power off, units are stored in memory. Therefore, until new values are set, it is possible to continue usage as it is.

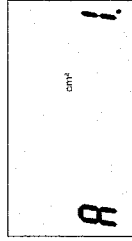
On this instrument, calculation is based on 1 foot = 12 inches.

If you wish to take measurements in ha (hectares), first measure in km<sup>2</sup> and then divide by 100. Alternatively, measure in m<sup>2</sup> and multiply by 10000.

### CHAPTER 3 SETTING SCALE VALUES

1. 2 scale values are set. Vertical (A scale) and Horizontal (B scale).
2. First, ensure that the instrument is not in measurement condition. If instrument is in measurement condition, **SCALE** key is ineffective.

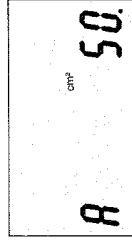
3. Press **SCALE** key.



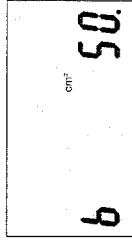
The present A scale value is displayed.

4. If you do not wish to make changes, go ahead to item No. 6.

5. Enter vertical axis scale using the numerical keys. For example for a 1:50 map, enter 50. If there is a mistake in the entry, press **C/AC** key and then enter the value again.



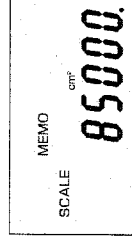
6. Press **SCALE** key. The present B scale value is displayed. If there is a change in the A scale value, that same value is displayed.



If this value is OK for B scale, go ahead to item No. 8.

7. Enter horizontal axis scale using the numerical keys. If there is a mistake in the entry, press **C/AC** key and then enter the value again.

8. Press **SCALE** key.



Scale selection is finished.

## CAUTION

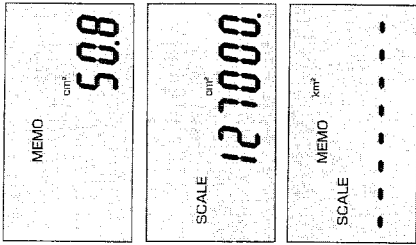
- If the scale changes, measured values are re-calculated and displayed accordingly.

{Example}

If scale is 1:1 (A=1, B=1), measured value is as shown on the figure to the right.

If scale is changed to 50:1 (A=50, B=50), measured value will change as shown on this figure.

- If due to change in scale, the calculated value goes over (99999999 and above) or under (0.0000001 and below). The display will show as in the figure on the right.



## NOTE

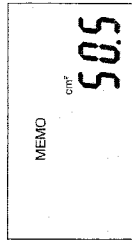
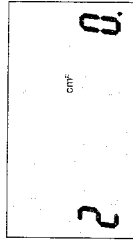
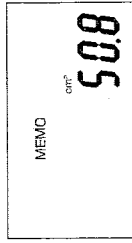
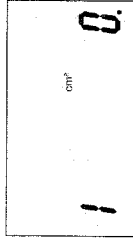
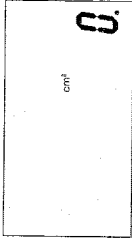
Using Auto power off, or even if the **OFF** key is pressed to turn power off, scales are stored in memory. Therefore, until new values are set, it is possible to continue usage as it is.

## CHAPTER 4 DERIVING AVERAGE VALUES

For example, to derive the average value of 3 measurements.

1. First, ensure that the instrument is not in measurement condition.
2. If "MEMO" is showing on the display, this means that previous data still remains in memory. Press **C/AC** key to clear the memory. Make sure that "MEMO" has disappeared from the display.
3. Following instructions in chapter 1, take measurement 3 times.

Press **START** key to take measurement.

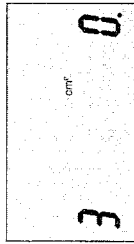


Press **MEMO** key to finish the first measurement.

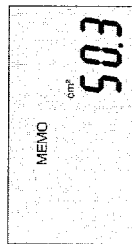
Press **START** key to take the second measurement.

Press **MEMO** key to finish the second measurement.

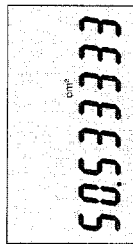
Press **START** key to take the third measurement.



Press **MEMO** key to finish the third measurement.



4. Pressing the **AVER** key will display the average value.  
Stored memory will be cleared.



#### CAUTION

The memory can store 10 measurements data. Therefore, it is not possible to calculate an average for 11 measurements. If the 11th measurement is taken, data for the previous 10 measurements will be cleared and storage starts from first measurement.

## QUICK MANUAL

### 1. MEASUREMENT

Press **START** to start measurement, trace external circumference, press **MEMO** to finish.

### 2. AVERAGE VALUE

Take a number of measurements (less than 10 times). Press **AVER**.

### 3. SET SCALE

Press **SCALE**. Set the vertical scale. Press **SCALE** again to set the horizontal scale. Press **SCALE** again to finish.

### 4. SET UNITS

Select units using **UNIT-1** and **UNIT-2**.