



# instruction manual

**VAGINAL IMPEDANCE CHECKER**  
**Cat. No. MUROMACHI MK-12**



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**instruction manual**

**VAGINAL IMPEDANCE CHECKER**  
**Cat. No. MUROMACHI MK-12**

Serial No.

## **SAFETY CONSIDERATIONS**

**ALTHOUGH THIS INSTRUMENT HAS BEEN DESIGNED WITH INTERNATIONAL SAFETY STANDARD, THIS MANUAL CONTAINS INFORMATION, CAUTIONS AND WARNINGS WHICH MUST BE FOLLOWED TO ENSURE SAFE OPERATION AND TO RETAIN THE INSTRUMENT IN SAFE CONDITIONS.**

**SERVICE AND ADJUSTMENTS SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL, AUTHORIZED BY UGO BASILE ORGANIZATION.**

**ANY ADJUSTMENT, MAINTENANCE AND REPAIR OF THE OPENED INSTRUMENT UNDER VOLTAGE SHOULD BE AVOIDED AS MUCH AS POSSIBLE AND, WHEN INEVITABLE, SHOULD BE CARRIED OUT BY A SKILLED PERSON WHO IS AWARE OF THE HAZARD INVOLVED.**

**CAPACITORS INSIDE THE INSTRUMENT MAY STILL BE CHARGED EVEN IF THE INSTRUMENT HAS BEEN DISCONNECTED FROM ITS SOURCE OF SUPPLY.**

**MODEL MK-12**  
**RAT VAGINAL IMPEDANCE CHECKER**  
**OPERATION MANUAL**



## TABLE OF CONTENTS

	<u>Page</u>
I      INTRODUCTION	1
II     BLOCK DIAGRAM	1
III    SPECIFICATIONS	2
IV    UNPACKING	2
V     DESCRIPTION OF FUNCTIONS	3
VI    OPERATING PROCEDURES	4-5
VII   HOW TO CHECK MAIN UNIT, CABLE & PROBE	6-7

## I INTRODUCTION

RAT VAGINAL IMPEDANCE CHECKER has been designed to obtain a precise information on optimum day for mating during estrous cycle in the rats.

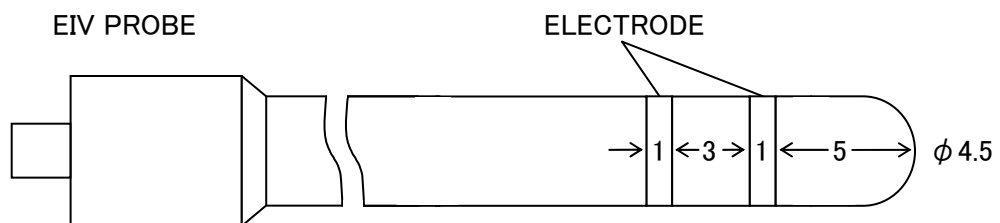
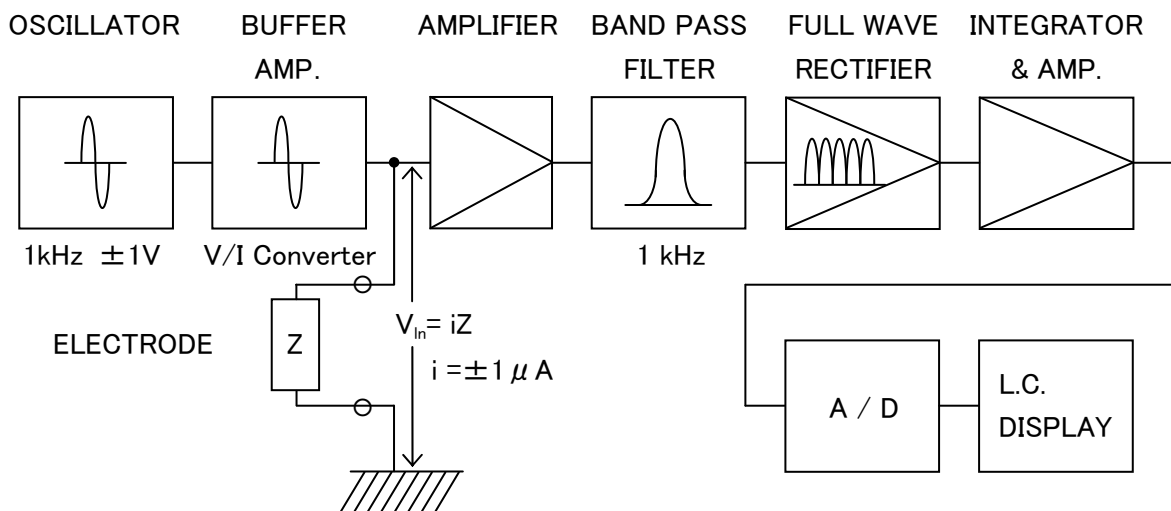
The electrical impedance of the epithelial cell layer of vaginal mucosa is measured at the frequency of 1 KHz by insertion of the probe into vagina.

In the proestrus stage significantly high impedance is produced compared to that in the other stages of the estrous cycle in the rats.

3 Kohm of impedance can be considered a standard indicating proestrus stage.

Measuring range is 0 – 19.9 Kohm.

## II BLOCK DIAGRAM



### III SPECIFICATIONS

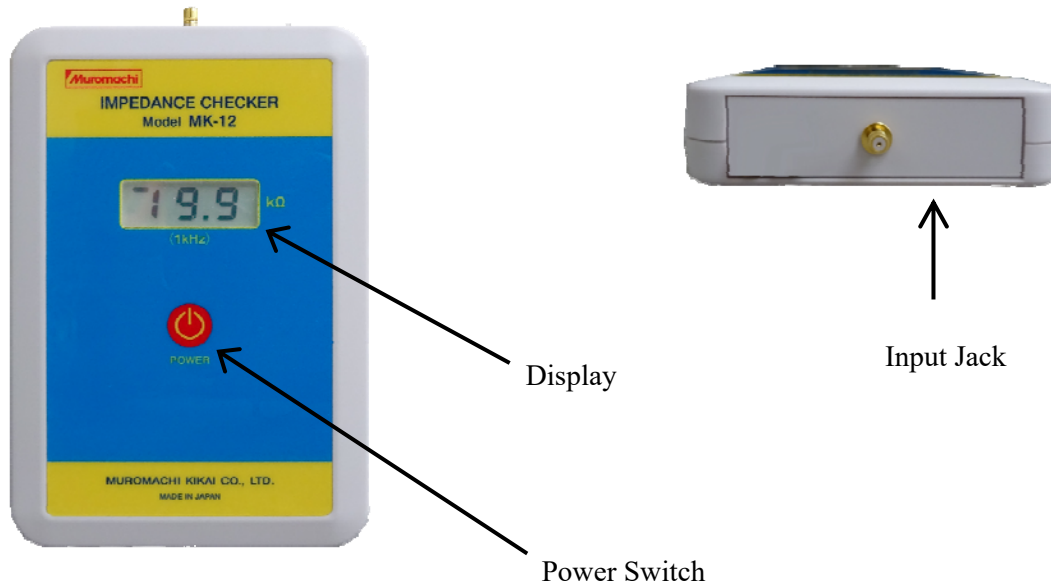
SPECIFICATIONS	
Measuring Range	0 - 19.9 k $\Omega$ (1 KHz)
Accuracy:	$\pm 1$ % $\pm 1$ digit
Display	LCD
Battery	2 AA size Ni-MH (rechargeable)
Instrument Dimensions	96W $\times$ 145D $\times$ 25H (mm)
Weight	Approx. 200g

### IV UNPACKING

The MK-12 is shipped in one carton box. Carefully unpack all items and confirm safe arrival of each piece shown on the packing list. Your system consists of the followings :

- MK-12 Main Unit 1
- RP-45A Rat Probe 1
- CA-100A Cable 1
- Charger (4 rechargeable batteries included) 1
- Operation Manual 1

## V DESCRIPTION OF FUNCTIONS



Display : Liquid Crystal Display for impedance read-out.

Power Switch : The device is automatically calibrated when turning on the power.  
(When the impedance of 19.9 kΩ or higher lasts for one minute, automatic calibration will be performed. When it lasts for five minutes, the device turns off.)  
To power off, hold this button for a few seconds.

Input Jack : Probe connector.

## VI OPERATING PROCEDURES

Before starting a measurement, prepare a beaker (or a cup) containing water, and gauze or paper towel to wipe up any excess water.

- 1) Connect an appropriate probe into the probe connector.
- 2) Turn on POWER switch.  
An impedance value is displayed on the LCD after automatic calibration.  
When no probe is connected, [19.9] and the arrow mark facing left side will be shown on the display. This arrow mark indicates “over range”.  
When the impedance of 19.9 k $\Omega$  or higher lasts for one minute, automatic calibration will be performed.
- 3) The Impedance value of where the probe electrode make contact is shown on the display.
- 4) Dip the tip of the probe into the beaker (or the cup) containing water and rinse it.
- 5) Wipe the probe with antiseptic cotton.  
Now the measurement is ready.
- 6) Hold a rat in a supine position with a left hand.
- 7) Insert the probe with a right hand into the deepest point of the vagina gently.
- 8) Depress the lower part of abdomen of the rat slightly with the thumb of the left hand. Thus vaginal mucosa and probe surface stick closely each other and a stable reading can be obtained.



- 9) After the measurement, hold the power switch to power off  
Disconnect the probe and wipe it off with diluted (70%) alcohol.  
(When the impedance of 19.9 k $\Omega$  or higher lasts for five minutes, the device turns off.)



## <IMPORTANT NOTE FOR OPERATION>

1. When the display flashes, it is time to recharge the batteries.  
Expected battery life (at full charge, 1950mAh Ni-MH)  
Under continuous use: approx. 42 hours  
At Power off: approx. 1 year and 10 months
2. When holding a rat with a hand or when inserting a probe, it is possible for the rat to urinate. If the urine gets into the vagina, impedance will become lower. In such a case take out the probe and wash it with water.
3. It is recommended that measurement should be done between 13:00 - 15:00 of the day.  
The reasons are as follows:
  - (A) In the mornings the impedance value of the rats at the Estrus stage becomes high.
  - (B) In the evenings the impedance value of the rats at the Diestrus stage becomes high. Further, it may be possible that the probe insertion in the evenings into vagina of the rats at their Proestrus stage would cause spurious pregnancy.

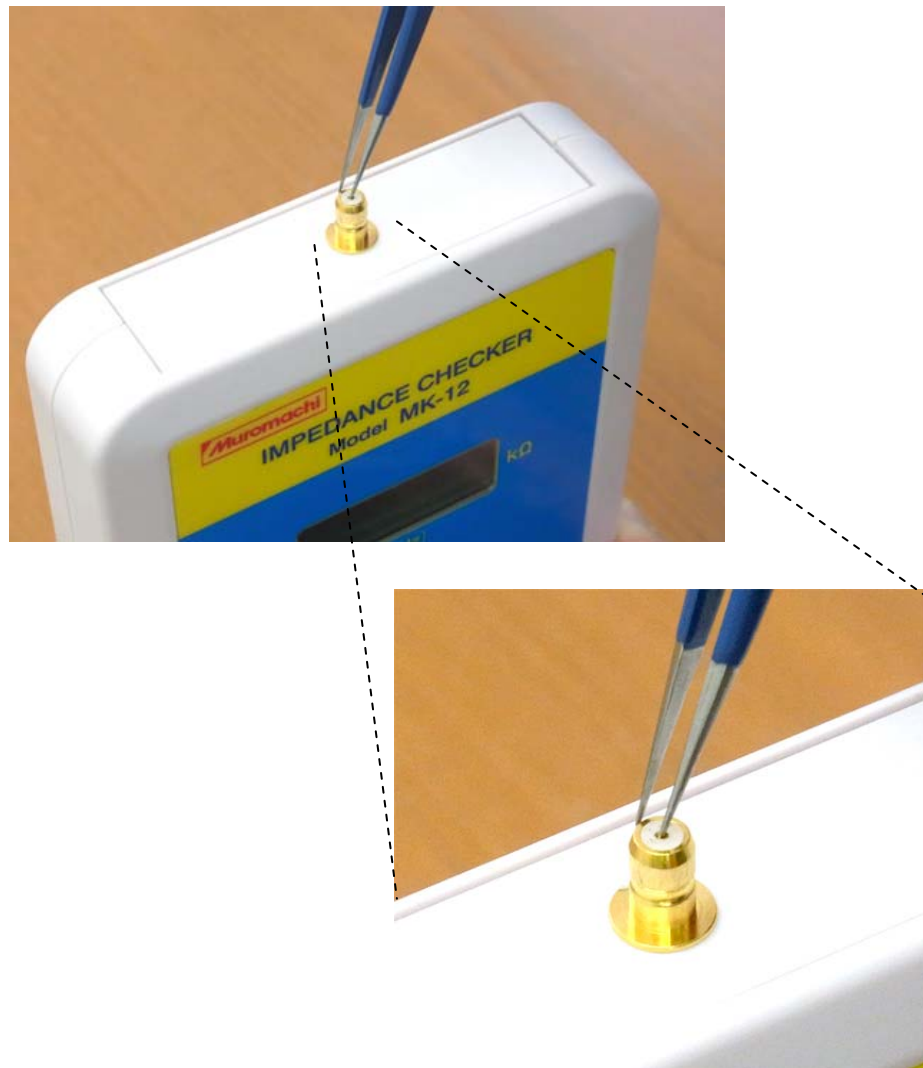
Therefore, by all means the measurement should be done between 13:00 - 15:00 of the day.

## VII HOW TO CHECK MAIN UNIT, CABLE & PROBE

### A. How to check whether main unit is working properly

Tools Required: non-isolated, pointed forceps

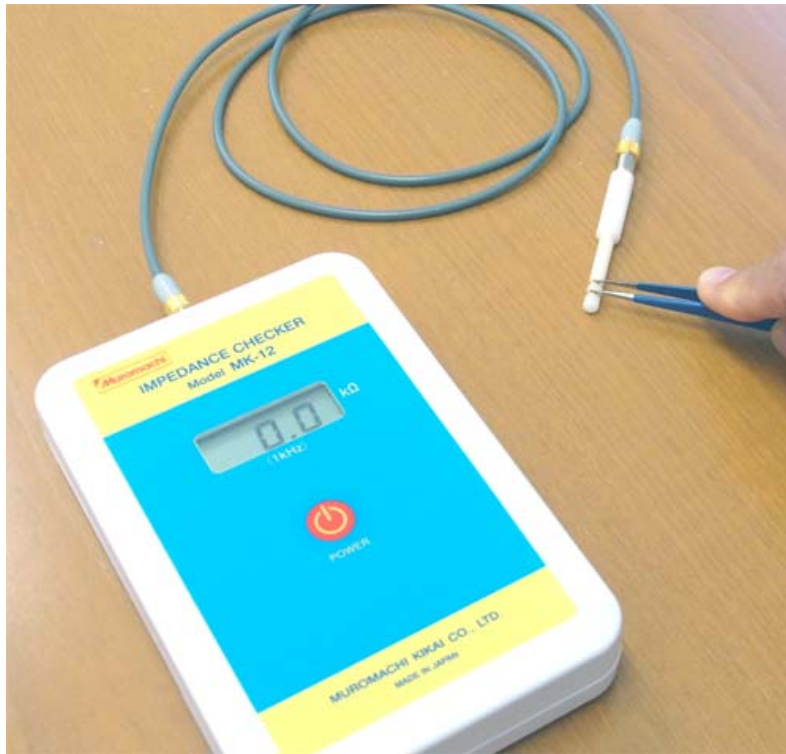
1. Remove the probe and cable from the main unit.
2. Turn on the power and wait until automatic calibration completes.  
Display should read “19.9”
3. Using the forceps, touch the center point and the external metal part to perform an electrical continuity check as shown in the photo below.



If the figure displayed on the LCD immediately changes from “19.9” to “0.0”, the main unit is working properly. Otherwise, the main unit should be repaired.

## B. How to check whether cable and probe are working properly

1. Connect the cable and the probe to the main unit and turn on the power.
2. Using the forceps, touch the two metal parts on the probe simultaneously to perform an electrical continuity check as shown in the photo below.



If the figure displayed on the LCD immediately changes from “19.9” to “0.0”, both the cable and the probe is working properly. However, if the display still reads “19.9” or “numeric figure other than 0.0”, the cable or the probe is considered defective.

\*When checking only the cable, take off the probe and touch both the center pin and the external metal part of the cable pin to perform an electrical continuity check using the forceps.

**NOTE:** Touch the center pin GENTLY to avoid damaging the pin.

For improvements specifications are subject to change without notice.

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TRANSFORMING IDEAS  
INTO INSTRUMENTS

## CE CONFORMITY STATEMENT

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*We hereby declare that*

Instrument. **IMPEDANCE CHECKER**  
Catalog number **MK-12**

*is manufactured in compliance with the following European Union Directives  
and relevant harmonized standards*

- *2014/30/UE relating to electromagnetic compatibility*
- *2011/65/UE and 2015/863/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

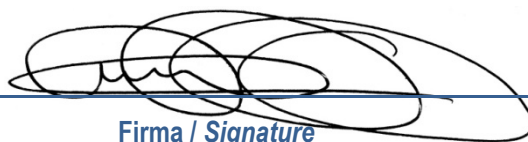
**Account Manager**

**Mauro Uboldi**

Nome / Name

**October 2018**

Date



Firma / Signature