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# MIYAWAKI

# ULTRASONIC TESTER

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# PM11

## OPERATOR'S MANUAL



Be sure to read this manual for safe and proper operation.  
Store this manual carefully after use.

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## TO THE OWNER

- This machine is a simple, handheld device used to check for deterioration in various kinds of control valves, like steam traps, to monitor motor bearings and to diagnoses other mechanical equipment.
- This machine is also a device belonging to our product, “Steam Trap Survey Assistant Dr. Trap Jr.”.
- The proprietary software called SurveyPro Light provides you with quick analytical results just by entering the vibration data you measure with this machine.
- It is recommended you use this machine with SurveyPro Light to get objective and quantitative survey results.
- In order to get maximum benefit from this machine, be sure to read this manual before starting to use this machine.

### **Maintenance**

When the machine is in abnormal condition, take necessary remedies. If the machine is still abnormal, ask MIYAWAKI dealer and give the following information:

- (1) Machine model
- (2) Serial No.
- (3) Detailed description of abnormal condition

### **Supply Period For Maintenance Parts**

The period during which we supply maintenance parts for this machine is 5 years after we discontinue production of this machine.

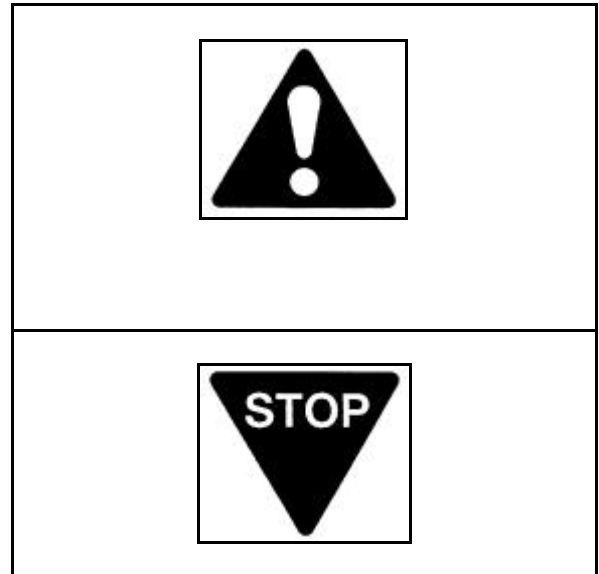
The supply of maintenance parts will, in principle, terminate at the end of the supply period stated above. However, even after the supply period has terminated, we still consult with you about the delivery time and the prices for parts still in stock, if required.

# 1. SYMBOL INDICATION

## ? SYMBOL INDICATION

### (1) Safety-alert Symbol

- (A) This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the possibility of personal injury and carefully read the messages that follow.
- (B) This stop symbol indicates important proper operation messages in this manual. When you see this symbol, carefully read the messages that follow.



### (2) Signal Words

The signal words "DANGER" "WARNING" "CAUTION" are used with the safety-alert symbol.

- (A) "DANGER" denotes the extreme hazard which would result in high probability of irreparable injury if proper precautions are not taken.
- (B) "WARNING" denotes the hazard which would result in injury if proper precautions are not taken.
- (C) "CAUTION" denotes the general precautions.



## 2. SAFETY INSTRUCTIONS

Observe the following instructions to insure safe operation. If not, you may be seriously injured and the machine may be damaged.

- The vibration probe in the PM11 is used by pressing it against the object being tested.
- Do not use the probe for any other purpose.
- Do not immerse the machine or its temperature probe in water. Wipe off any splashes of liquid.
- Never pull on the tip of the temperature probe and be careful not to place the cable in direct contact with steam pipes
- If the machine display doesn't show anything after installing the batteries and pressing the key, remove the batteries immediately and reinstall them correctly.
- If using rechargeable batteries, only use 1.2V size AA rechargeable batteries.
- Do not store the machine in a humid environment. When you will not use the machine for a long time, it is recommended that you remove the batteries.



### **WARNING**

**The machine is not explosion proof. Do not use it in any environment that might contain hazardous gas. Failure to observe this precaution may lead to serious injury or death.**

### 3. SPECIFICATIONS

Housing	Heat-resistant plastic (ABS) Simple waterproofing treatment.
Weight	230g (approx.8oz) including two batteries.
Power supply	2.4 - 3.0V 2 x 1.5V AA size alkaline cells, or 2 x 1.2V AA size nickel-metal hydride cells.
Continuous operating time	Alkaline batteries: 45 hours or more. (32 hours or more with the LCD light on continuously.) NiMH batteries (1600mAh): 32 hours or more. (25 hours or more with the LCD light on continuously.)
Ambient working temperature	0 – 40°C (32° – 104°F)
Vibration sensor Sensitivity Input frequency	Piezoelectric ceramic accelerator. 30pc/g±5% 10k – 40kHz
Temperature sensor Temperature range	Thermistor sensor. 0 – 250°C (32° – 482°F)
Display	Illuminated liquid crystal display (LCD).
Operation	1 key operation: Turn the power on/off, Turn the LCD light on/off, Start/stop the stopwatch, Switch the display between the stopwatch and the pressure.

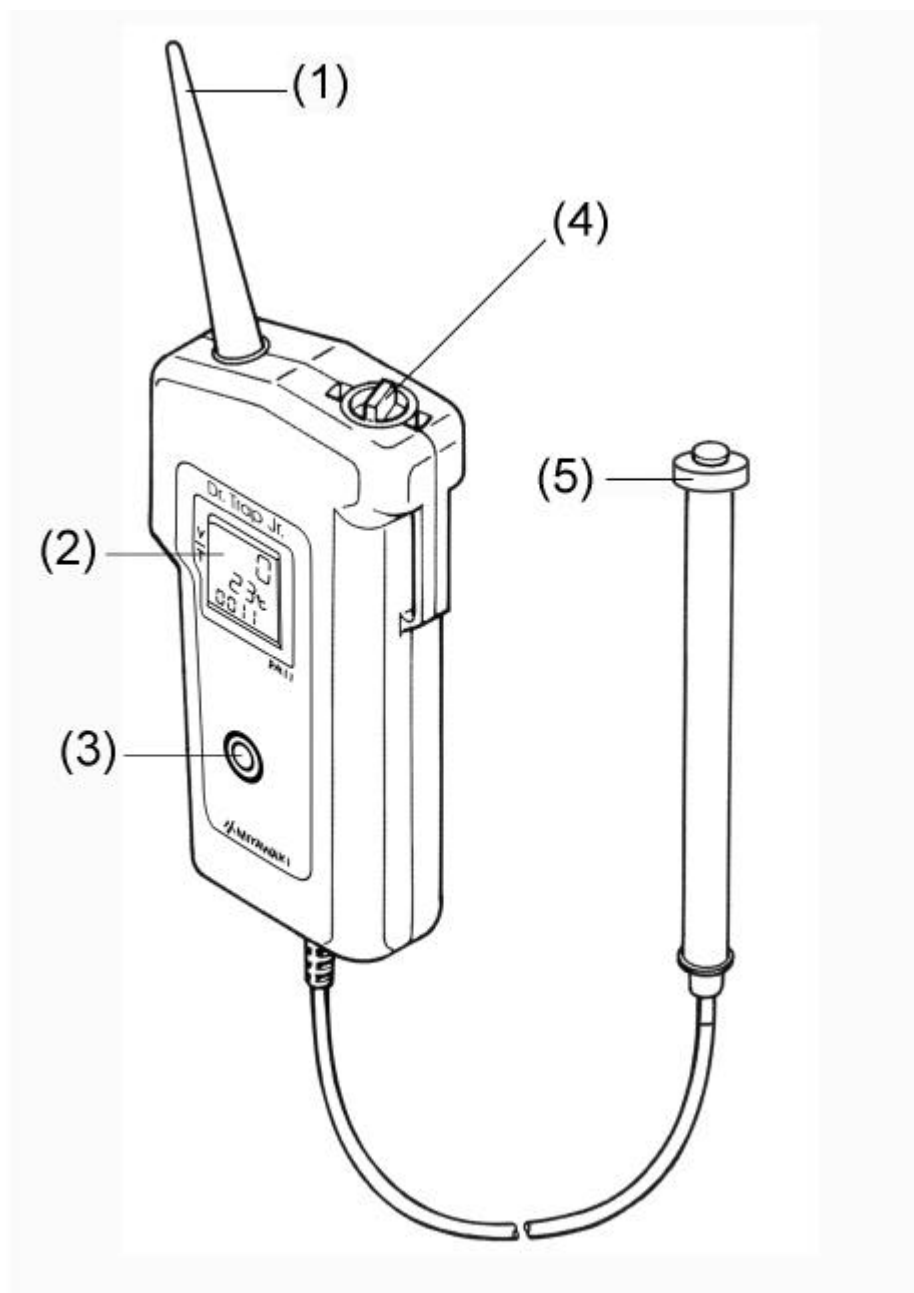
### 4. LIST OF SUPPLIED ITEMS

Make sure the following items are included in your package.

- PM11
- Temperature probe
- Two 1.5V alkaline batteries
- Black strap (Refer to “BLACK STRAP FIXING PROCEDURE”, in this manual.)

## 5. NAMES OF THE COMPONENTS AND PARTS

- (1) **Vibration probe:** Detects vibration in an object.
- (2) **Display panel:** Illuminated liquid crystal display. Displays vibration, temperature, etc.
- (3) **Operation key:** Use this key to turn the power on/off, to turn the display light on/off, and to start/ stop the stopwatch.
- (4) **Battery cap:** Turn this cap counter-clockwise to remove it from the PM11. Place two batteries in the compartment with their positive (+) ends facing up.
- (5) **Temperature probe:** Detects the surface temperature of an object.



## 6. FUNCTIONS

### Vibration Display:

The machine displays the measured vibration value on the top line of the LCD window. The vibration value is displayed as a reading from 0 to 400. When a vibration severer than 400 is measured, the value 400 will flash. The displayed vibration reading is a relative integer value, which the machine has calculated by converting the actual physical vibration that is measured. The acceleration sensor's output is digitized as a proportion of the measurable range.

### Temperature Display:

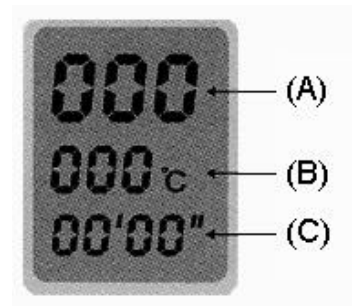
The machine displays the temperature that it detects on the middle line of the LCD window. The range is 250°C (482°F). When a temperature higher than 250°C (482°F) is detected, the value 250 (482°F) will flash.

### Peak value display:

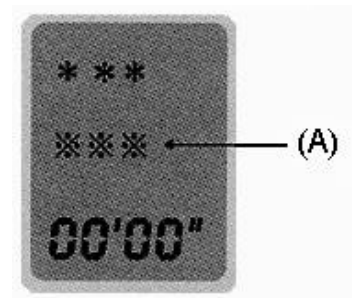
When the temperature probe is not connected, the peak vibration value that has been measured will be displayed on the middle line of the LCD display, instead of the temperature. The peak value will disappear 3 seconds after the current vibration value returns to zero.

### Stopwatch:

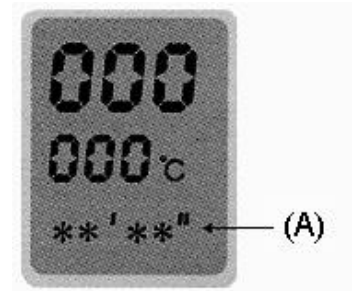
Pressing the key will start the stopwatch. After 1 hour and 40 minutes (99 minutes 59 seconds), the stopwatch will reset itself to zero and continue running. Pressing the key while the stopwatch is running will stop the stopwatch. Pressing the key again will reset the time to zero.



(A) Vibration value  
(B) Temperature value  
(C) Stopwatch



(A) Peak vibration

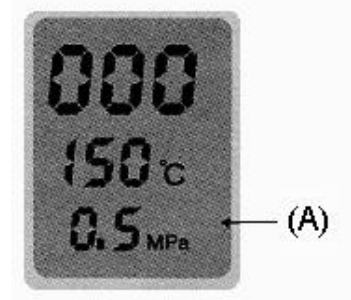


(A) Stopwatch operation



**Estimated steam pressure:**

By pressing and holding the key for 0.5 seconds with a temperature probe connected, the LCD windows will display the pressure instead of the stopwatch. The value displayed is for a steam pressure that corresponds to a temperature that is about 10° (18°F) higher than the temperature actually detected. This function may be useful when checking steam valves and pipes. Press the key momentarily to return the display to the stopwatch.



(A) Steam pressure

**LCD light on/off:**

The LCD display will be illuminated by double clicking the key. Double clicking the key again will turn the light off.

**Power on/off:**

Pressing the key turns the power on.  
Pressing the key and holding it for 2 seconds turns the power off.

**Automatic power off:**

The PM11 will switch off automatically if the key is not pressed for 5 minutes while no vibration is detected and the temperature reading is lower than 50° (122°F).

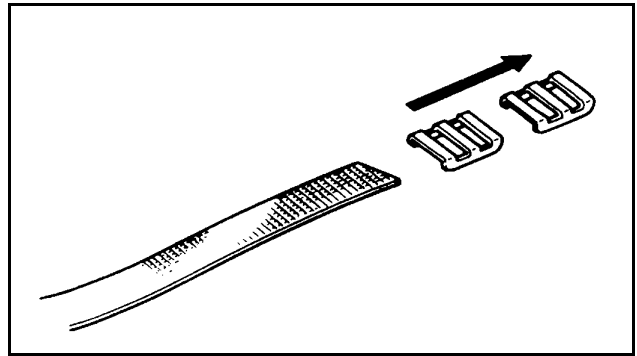
**Battery life warning:**

When the batteries run low, the LCD display will display "Batt" to the right position of the middle line in the display.

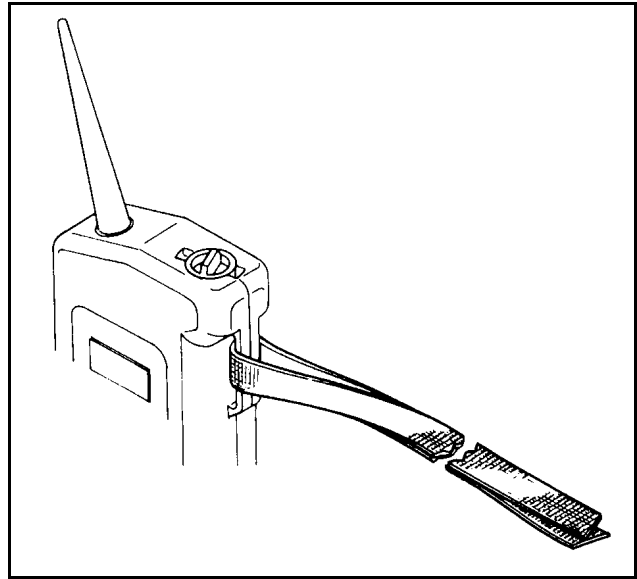


## 7. BLACK STRAP FIXING PROCEDURE

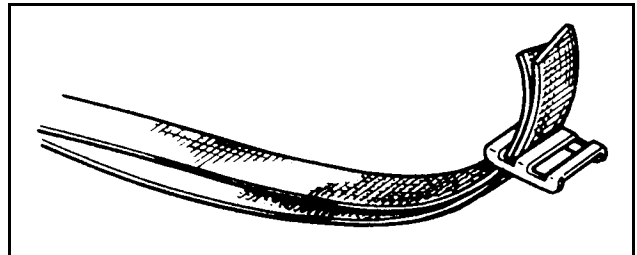
- (1) Remove the two buckles from the trap.



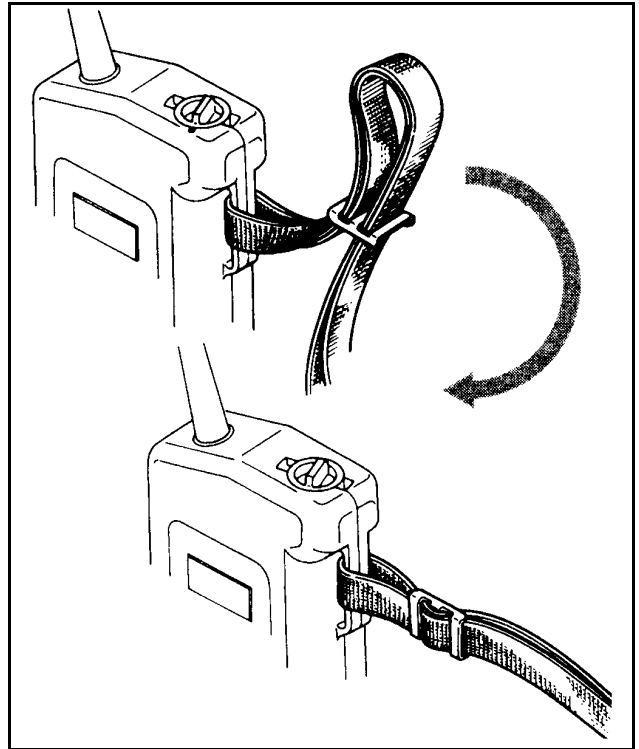
- (2) Pass the strap through the slit of the machine.



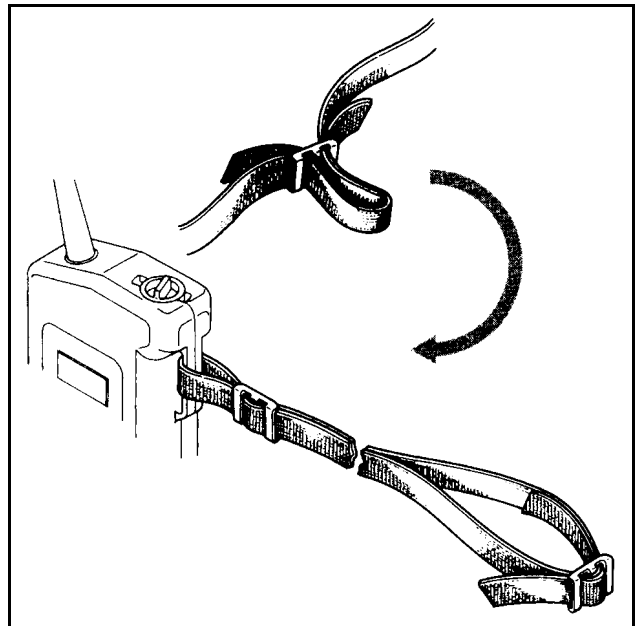
- (3) Putting both edges of the strap together, pass it through the openings of the buckle.



- (4) Move the buckle near to the slit of the machine.



- (5) Pass each half of the strap through the other buckle in the opposite directions and fix the length of the strap suitable to carry.



## **8. LIMITED WARRANTY**

Any failure that occurs in normal operating conditions will be repaired free of charge.

### **WARRANTY TERM**

This warranty Term shall be for the first 12 months starting from the date of delivery to you.

### **WHAT THIS WARRANTY DOES NOT COVER**

- (1) Damage caused by careless use or ignoring the warnings and cautions given in this manual.
- (2) Damage caused by severe shock or impact which would not be experienced in normal operation.
- (3) Damage caused by unauthorized modifications or repairs.
- (4) Damage caused by fire, natural disasters, or acts of God.

### **WARRANTY SCOPE**

In any event, the scope of warranty is limited to compensation that does not exceed the purchase price and in no case will the manufacturer be responsible for consequential damages or secondary losses of any kind.



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