



# **Portable Water Meter Test Kit TR-V**

## **Instruction Manual**

Thank you very much for purchasing Aichi Tokei Denki's portable water meter test kit TR-V.

- Please read the instructions in this manual before use so that you are able to use the test meter properly.
- Be sure to keep this instruction manual after you have read it.

# **Aichi Tokei Denki Co., Ltd.**

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## 1. General

- Portable water meter test kit TR-V uses an electronic water meter (EDS20R) for measurement, and is equipped with a counter which can selectively display the instantaneous flow rate and trip accumulated volume (with reset) based on the pulse output from the water meter. This test meter is designed to check instrumental errors of installed water meters on site.

## 2. Using TR-V Safely and Correctly

Please be sure to read this section in order to use the TR-V portable water meter test kit safely and correctly.

We use various pictograms in this instruction manual to help users use the product correctly, to prevent harm to themselves or others, and to prevent property damage. This table describes these pictograms and their meanings. Please read the instructions carefully.

Label	What it means	Page
 <b>Danger</b>	This indicates that there is an imminent risk of death or serious injury to a person if the meter is mishandled as result of ignoring this display.	N/A
 <b>Warning</b>	This indicates that there is a risk of death or serious injury to a person if the meter is mishandled as result of ignoring this display.	N/A
 <b>Caution</b>	This indicates that the user can incur damage and that the damage is confined to property damage only if the meter is mishandled as result of ignoring this display.	3

Other pictograms have the following meanings.



General prohibitions



Must not disassemble







Must do




### 3. Be sure to follow these instructions to ensure safety



#### Caution

1.  **Do not let the test meter fall.**  
Do not drop the test meter or subject it to strong impacts. There is a risk of personal injury or damage to the test meter, rendering it unable to make accurate measurements.
2.  **Do not apply impact pressure to the test meter.**  
Do not install the test meter on a piping system where it can be subjected to impact pressure, or rapidly open or close the water supply valve of a piping system with the meter connected to it. Either one of these actions may lead to water leaks from the test meter and its connections. Also, if the test meter is not properly installed, there is a risk of water blowing out vigorously from the test meter's connections.  
(maximum permissible working pressure: 0.75 MPa)
3.  **When removing the test meter, make sure to fully release the pressure in the piping.**  
Any residual pressure in the piping creates the risk of water blowing out vigorously from the test meter's mounting points.
4.  **Do not splash water to the test meter, or do not allow foreign objects to enter the inside of the equipment.**  
It causes the malfunction of the water meter and counter which are equipped inside of test meter.

### 4. Transportation, Storage, Management, and Disposal

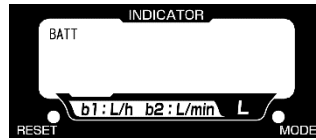
1.  To prevent the intrusion of dust, foreign matter, etc., attach the cap to the meter's connections. Also, make sure to remove all water from inside the meter after use.
2.  To prevent damage and ensure its instrumental error accuracy, use and store the test meter at the following temperatures.  
Ambient operating (storing) temperature:  $-10$  to  $+50^{\circ}\text{C}$  ( $+14$  to  $+122^{\circ}\text{F}$ )  
Temperature range of water used:  $+0.1$  to  $+30^{\circ}\text{C}$  ( $+32.18$  to  $+86^{\circ}\text{F}$ ) \*Do not freeze.
3.  Do not disassemble, repair, or modify the test meter.  
Any of these actions may lead to damage to the test meter, water leakage, and poor instrumental error accuracy. Also, please note that they will void your warranty.  
If you notice any abnormalities with your test meter, please contact your dealer.
4. A damaged test meter is not reparable, and must be replaced if damaged. A damaged unit cannot be repaired or have its parts replaced so please handle the product carefully.
5. Regular inspections (every 2 years) are recommended to ensure instrumental error accuracy.  
(While the meter used in the measurement part is an approved device, regular inspection of the instrumental error is recommended since this test meter is designed to be portable.)

6. The counter's battery has a life of approximately 4 years (Battery life varies depending on the environment the meter is used in).


When the battery level is running low, an alarm message "BATT" will flash in the upper left corner of the counter's display, informing you that the battery needs to be replaced.

(For battery replacement, see "9. Warranty and After-Sales Services" [P9])

- \* The integrated flowrate value display (accumulated total) and counter settings will not be reset if the counter turns off due to a dead battery or while making a battery replacement.



Low battery level (BATT)

7.  When disposing of the unit, do not cut, disassemble, change the shape of, or heat the unit, or place it near or in an open flame, or perform any other similar acts.

Please use extra care as the lithium batteries used in the meter and counter in the measuring component may heat up, ignite, or break.

- \* Make sure to dispose of used batteries in accordance with government and municipal regulations.

## 5. How to Install the Test Meter

Please see "8. Parts and their Names" (P8).

- (1) Check the direction of flow of the unit.



Inlet (upstream side)



Outlet (downstream side)

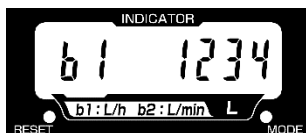
- \* If water is sent through a test meter that is installed backwards, the counter will not run until at least the same amount of water as the amount that was made to flow in the reverse direction is made to flow in the correct direction. If you accidentally let the water flow in the reverse direction, reconnect the unit in its correct orientation, and send at least the same amount of water as the amount sent in the reverse direction.
- (2) Connect each of the supplied hoses with one-touch joint (connector) (i.e., a transparent hose with connectors on the both ends for the upstream side and one with a connector on one end for the downstream side) to each joint (nipple) of the body. (Pull each hose gently to check if it is firmly connected.)
- (3) Choose one of the joints (nipples) below according to the type of the tap where the test meter is to be installed and attach it to the tap:
- 1) Tap nipple with band (pipe-type flexible faucet 1/2 caliber (13) for tap)
  - 2) Nipple for foam tap (e.g., single-lever type)
- (4) Connect the one-touch joint (connector) on the other end of the hose connected to the upstream side of the body (i.e., the hose with connectors on both ends) to the joint (nipple) connected to the tap.

## 6. Testing Method

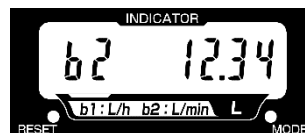
### 1. Preparation (for details on display operations, see "7. Display Operation Steps" [P7])

- (1) Be sure to remove all air from inside the meter so that it is filled with water.
- (2) Make sure the outlet hose is placed higher than the unit to prevent any inflow of air when the water flow is stopped. Also, make sure that the unit sits level.
- (3) Close the valve on the unit and check that there are no leaks from the piping.
- (4) Set the counter's display to "Instantaneous Flow Rate."

The instantaneous flow rate display shows two digits on the left, b1 or b2, and up to four digits on the right.



b1: L/h



b2: L/min


- (5) Fully open the valve on the unit and adjust the test flow rate according to how much the water supply faucet is opened.

Set the test flow rate at the rate provided in the attached Instrumental Error Performance Table. (See Flow Rate List [P5])

Units of display for instantaneous flow rate on this meter are L/h if the two digits to the left show b1, and L/min if they show b2.

#### ○ Flow rate List

Flow rate listed in the Instrumental Error Performance Table	Flow rate	
	L/h	L/min
High flow	1000	16.67
Medium flow	200	3.33
Low flow	100	1.67

- (6) Once you have adjusted the flow rate, close the valve on the unit.
- (7) Press the  button (twice for b1, once for b2) to change the counter display to "Trip Accumulated Volume" which is displayed in up to 7 digits.

In the accumulated volume display, the digit on the left side of the display will show "C."



Trip accumulated volume display (up to 7 digits)

- (8) Press the  button to reset this to zero.

## 2. Testing

- (1) Note the value indicated on the inspection target meter.
- (2) Fully open the valve on the unit. The recommended amount of water for testing is 100 L.
- (3) Close the valve on the unit and note the value indicated on the inspection target meter.
- (4) The instrumental error can be calculated using the following formula.

$$\text{Instrumental error (\%)} = \frac{\text{Accumulated volume of the inspection target meter} - \text{Accumulated volume of TR-V}}{\text{Accumulated volume of TR-V}} \times 100 + \text{Instrumental error correction value}$$

Instrumental error correction value: Add the instrumental error for the applicable flowrate provided in the attached Instrumental Error Performance Table. (Subtract the instrumental error if it is in negative.)

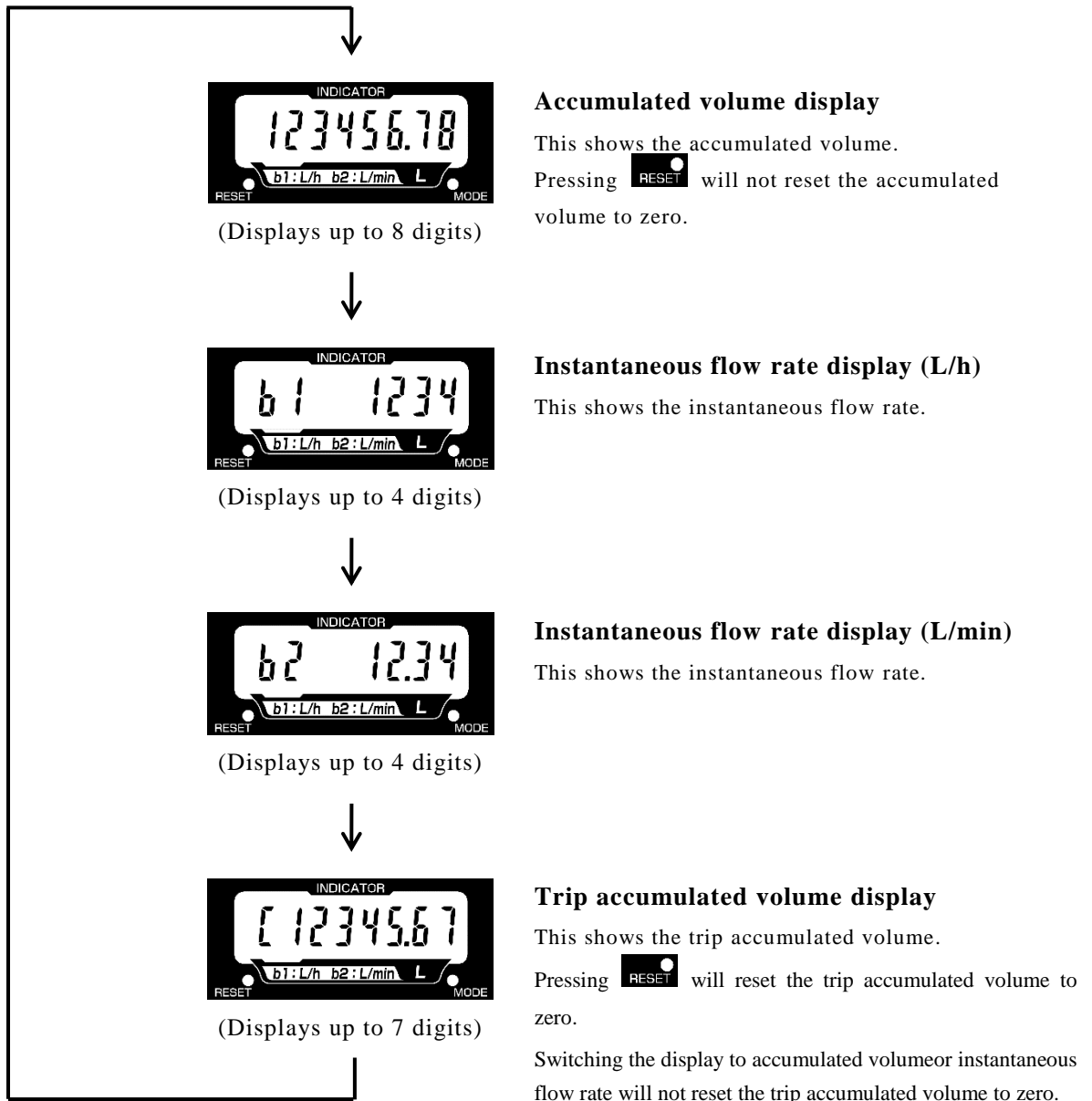
### **Instrumental Error Achievement Table (Standard Sample)**

Instrumental error achievement table		
Product name	TR-V	
Serial No.		
Official approval term of validity		
This product contains a battery powered water meter which is a specified measuring instrument.		
Test date		
Test tank	0.5m <sup>3</sup> tank	
Instrumental error		
High flow rate	Middle flow rate	Low flow rate
1000 L/h	200 L/h	100 L/h
16.7 L/min	3.3 L/min	1.7 L/min
<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div> %	<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div> %	<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div> %
Aichi Tokei Denki Co., Ltd. Inspection Division, Quality Assurance Headquarters 1-2-70 Chitose, Atsuta-ku, Nagoya		
Regular inspection (once in two years) is recommended in order to maintain precision of the instrumental errors.	Approval	Creation

☐ is the "instrumental error correction value" specific to this product

## 7. Display Operation Steps

- Press **MODE** to cycle through the displays shown below.



**⚠ Do not hold **MODE** down for 5 seconds or longer.**

Doing so will take you from the measurement mode to settings mode. You will not be able to make correct measurements unless settings are made correctly.

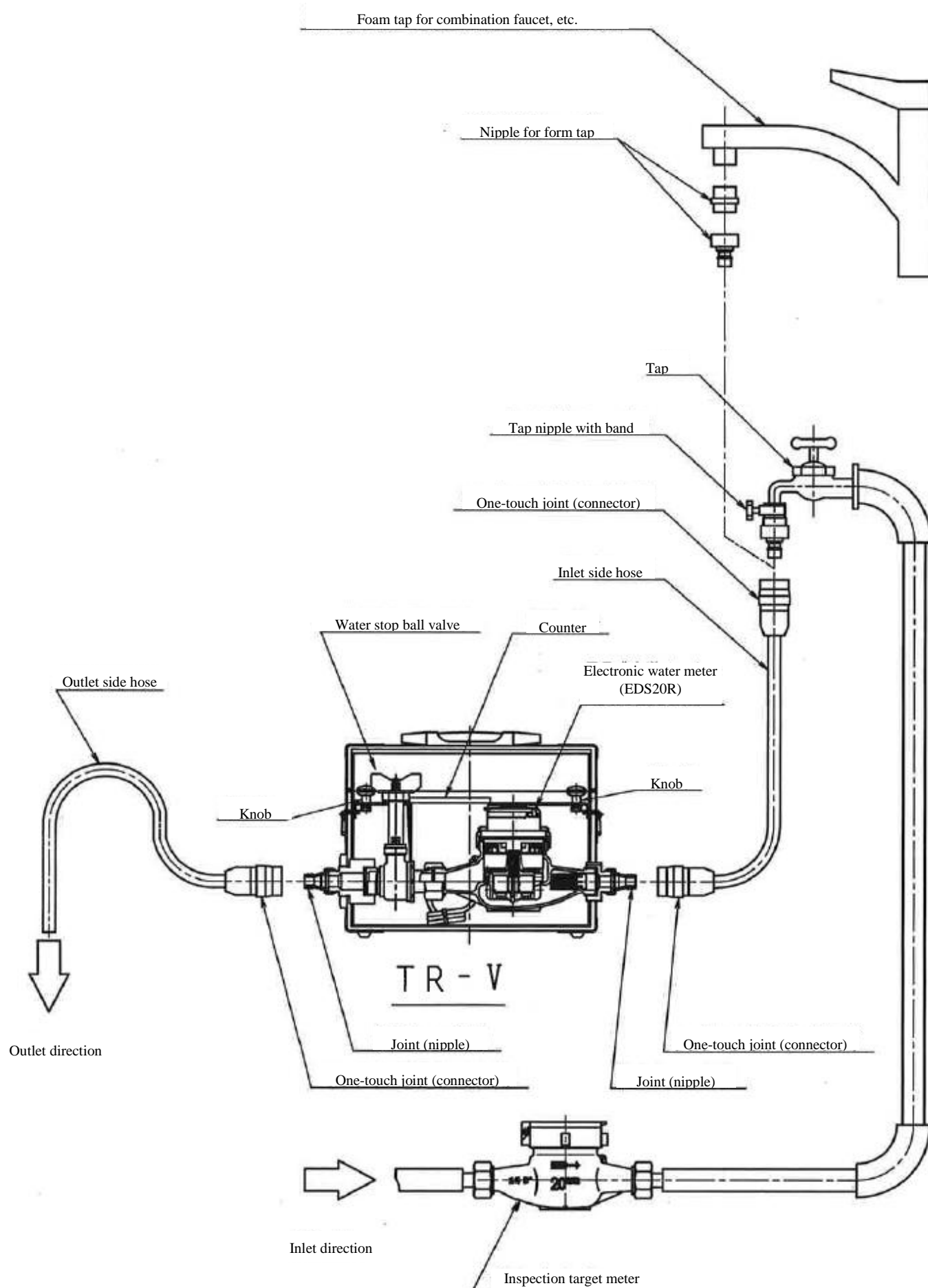
**⚠ Make sure that you are not in settings mode.**

If you see a display other than any of the above when you press **RESET** or **MODE**, you are in settings mode. You will not be able to make correct measurements unless settings are made correctly.

- © To switch from settings mode to measurement mode, press **RESET** or **MODE** to change the display to "bdAtA," and then press **MODE** for 5 seconds to return.



## 8. Parts and their Names



## 9. Warranty and After-Sales Services

- Warranty period

Units that develop faults induced by issues with our manufacturing will be replaced or repaired free of charge for one year from the date of purchase.

- Repairs

If you experience a problem with the meter, ask for repairs at one of our branches or sales offices.

When you do so, please give us information on the circumstances of the failure in as much detail as possible.

Please note that after your warranty expires, we would like to perform repairs for a fee, provided that the unit's functionality can be restored.

- Battery replacements

Please contact one of our branches or sales offices if you need to replace batteries.

Batteries for this product can also be replaced by the customer on their own.

Please note that there is a charge for replacement batteries, and problems that arise from customers replacing a battery on their own, and problems with the unit itself after such battery replacement are excluded from the scope of the warranty.

(See the attached "Battery Replacement Procedure" on how the user can replace batteries on their own.)

Upon request, we will also be happy to replace your batteries for a charge.

- Warranty coverage

This product is manufactured under a thorough quality assurance system. Notwithstanding, if a failure within the scope of our responsibilities as the manufacturer occurs within the warranty period under normal use, we will repair or provide a replacement product free of charge.

However, the applicability of free support for defective products will depend on the results of our investigations. Also, if any of the following descriptions apply, the product will be excluded from the scope of this warranty.

- 1) Failures caused from using the product without following the information described in catalogs, product specifications, instruction manuals, etc.
- 2) Failure due to damage induced by disasters such as fires, earthquakes, wind and flood damage, lightning strikes, etc., or criminal activity.
- 3) Failure due to product corrosion from using the product in a corrosive environment.
- 4) Failure induced by the behavior of living organisms such as dogs, cats, rodents, insects, etc.
- 5) Failure induced by causes not associated with our products.
- 6) Failure that was impossible to foresee based on the scientific and technical standards at the time of shipment.
- 7) Failure caused from repairs or modifications not made by us or other entity specified by us.
- 8) Failure due to improper inspection or maintenance, or replacement of consumable parts.

Note that the warranty referred to here denotes a guarantee solely for our products. Customer damages that are induced by the failure of our products (loss or damage incurred by products other than our products, lost profits, loss of opportunity, transportation costs, construction costs, etc.) are not covered by the warranty.

# Aichi Tokei Denki Co., Ltd.

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Sendai Branch	TEL(022) 258-1181	Shizuoka Sales Office	TEL(054) 237-7168
Aomori Sales Office	TEL(017) 742-6771	Matsumoto Branch Office	TEL(0263) 87-5730
Morioka Sales Office	TEL(019) 646-8836	Osaka Branch	TEL(06) 6305-9052
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		Kagoshima Sales Office	TEL(099) 254-7877
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For online inquiries

You can find support information on our website.



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