

# Intrinsically Safe Explosion-Proof High-Precision Tuning Fork Scale

## FZ-B Series Installation Manual

### IMPORTANT

- To ensure safe and proper use of the scale, please read this manual carefully.
- After reading this manual, store it in a safe place near the scale, so you can review it as needed.

SHINKO DENSHI CO., LTD.

410053M21





# Preface

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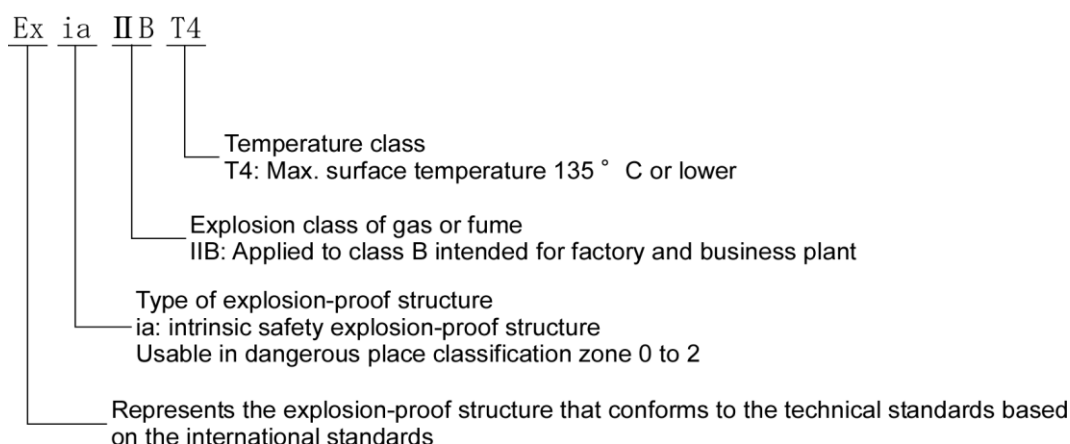
Thank you very much for having purchased a dust- and water-proof intrinsic safety explosion-proof structure electronic scale, FZ-B3200, FZ-B6200 and FZ-B15000.

This document describes important items to use the device safely in the explosive atmosphere. Read this document carefully before use to correctly operate.

## ■About the certified explosion-proof structure

This scale is an explosion-proof electronic scale that has been certified as an intrinsic safety explosion-proof structure electric device. It has been confirmed that the device does not explode due to the generation of electric sparks or temperature rise of a component not only during normal operation but also during abnormal operation (failure period) even when used in the atmosphere of explosive gas.

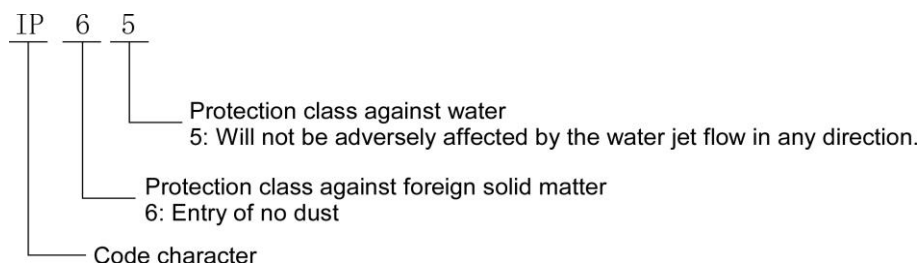
### Explosion-proof structure that has been certified



## ■About the dust- and water-proof structure

This scale is an electric device equipped with a dust- and water-proof structure. (IPX5 is maintained when this scale is mounted in accordance with this manual.)

### Protection class of a dust- and water-proof structure



## Notation of explosion-proof structure of electrical machinery and equipment

### ■ FZ-B3200, FZ-B6200, FZ-B15000

Certificate No. : 19-KA4BO-0361X

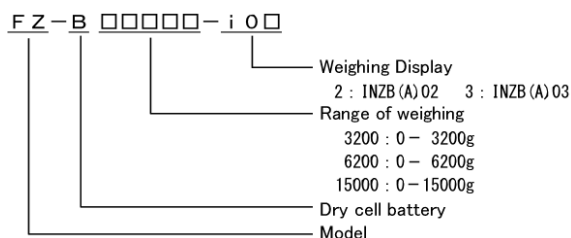
Type of explosion-proof structure : Intrinsically safe (ia)

Explosion proof symbol : Ex ia IIB T4

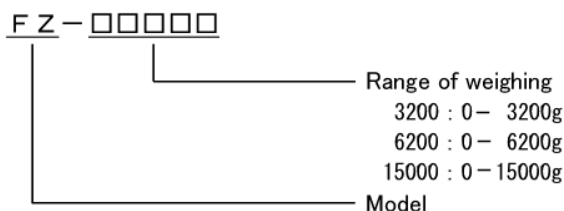
Power supply : 4 pcs of D size zinc-carbon dry cell (R20P Panasonic)  
4.0 to 6.0 V $\overline{\text{---}}$

S/N : XXYYYY where XX is last two digits of the year of manufacture.

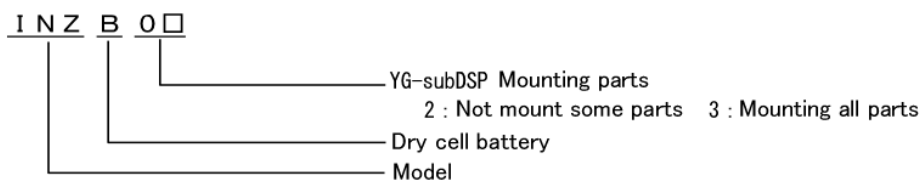
#### ■ System type



#### ■ Weighing instrument type



#### ■ Weighing indicator type



# Instructions

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- Documents of which pages are missing or irregularly bound will be exchanged. Please inform the store where you purchased the product or our sales department.
- Trouble related to the product or system will be dealt with in accordance with the individual maintenance contract. Please note, however, that we will not take responsibility for consequential trouble such as discontinuation of operation caused by the product trouble.
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# Important Notice

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- It should be known that this product contains potential danger. And so please be sure to observe this document when installing, operating or servicing this product.
- If the product is used in a manner not specified by the manuals or other accompanying documents, the protection provided by the product may be impaired.
- SHINKO DENSHI CO., LTD. will not take any responsibility for any injury or damage caused by the non-observance of this document or misuse or unauthorized modification of this product.



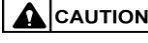

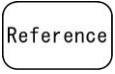


- Potential dangers are increasing in the industrial equipment industries due to the advent of new materials and processing methods, and speeding up of machines. It is impossible to foresee all situations related to these dangers. In addition, there are so many “impossible” and “don’ts” and so writing all of them in the operation manual is impossible. Therefore, it is safe to think that what is not written in the operation manual “cannot be performed” unless the operation manual positively writes “it is possible.” When performing installation, operation, maintenance or inspection of this product, not only observe what is written or indicated in this document or on the product surface but also pay adequate consideration to safety measures.
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- For any question or further information concerning this document, please contact the store where you purchased the product or with its model (type) name and serial number informed.
- Manufacturer: SHINKO DENSHI CO., LTD.  
Address: 1-52-1 Itabashi, Itabashi-ku, Tokyo 173-0004 Japan

# How to use this document

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## ■ Symbols used in this document

Understand the meaning of the following symbols and observe the instructions of this document.

Symbols	Meaning
	Used for high-risk point concerning the operations that may lead to death or severe physical injury to persons if proper precautions are not taken.
	Used for warning concerning the operations that may lead to death or severe physical injury to persons, if proper precautions are not taken.
	Used for caution concerning operations that may lead to a light physical injury to persons if proper precautions are not taken.
	Used for notation concerning operations that may lead to damage of the products/facilities/data if proper precautions are not taken. Used for accurate weighing and appropriate usage of the equipment.
	Used for reference information on operation.
	Used for “Prohibition” items.
	Used for “Mandatory” items requiring positive action.

## ■ About this document

This document describes how to install the indicator section and weighing section of the FZ-B Series.

For how to operate the product, please refer to the “FZ-B Series, UZ-B Series Operation Manual”.

## ■ About how to read this document

This document consists of the following contents:

1. Prior to use	Describes precautions, checking for articles contained in the box, the name and function of each section and the assembling and installation of the scale. Before installing and using the scale for the first time, be sure to read this document.
2. How to maintain	Describes how to maintain this product.
Appendix	Provides necessary data such as the specifications of this product.

## ■ About the notation

The following notation is used in this document.

This product	It indicates the FZ-B series product.
[On/Off] key	Names of operation keys on the front of the indicator section are described in [    ].
Mode	Messages to display are described in “    ”.
Press the key	It indicates pressing the operation key once lightly.
Long press the key	Press and hold the operation key and release the key when the display changes to the specified display.



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# 1 Prior to use

## 1-1 Precautions




	<p>■ <b>No disassembling or modification.</b> Unless specifically stated in this document, disassembling or modification of this product, mounting or removal of an undesignated component no longer maintains the function of the safety structure or explosion-proof structure, leading to a serious accident or physical injury.</p>
	<p>■ <b>Never disassemble, modify, inverse load, or short-circuit the battery.</b> It may damage or break the battery or cause the product to fail. It may not maintain the performance of explosion-proof construction and may cause explosion, fire or other accidents.</p>
	<p>■ <b>Do not use batteries other than the specified battery.</b> It may not maintain the performance of explosion-proof construction and may cause explosion, fire or other accidents.</p>
	<p>■ <b>Replace batteries in a non-hazardous area.</b> Replacing batteries at a hazardous area may cause explosion, fire or other accidents.</p>
	<p>■ <b>Connect the grounding terminal and cables properly.</b> Improper connection of the grounding terminal and cables will cause trouble such as an explosion or a fire.</p>
	<p>■ <b>Keep Scale cable away from electromagnetic source.</b> It may generate dielectric EMF, which degrades the intrinsic safety explosion-proof property of the product and may lead to an explosion.</p>
	<p>■ <b>Install Scale cable properly so as to prevent dielectric EMF.</b> Improper installation of them may impair the intrinsic safety performance of the product due to the electrostatic induction, and electromagnetic induction and may lead to an explosion.</p>






	<p>■ <b>Do not move the device with a sample to be loaded on the scale.</b> That may cause the sample to fall from the weighing pan, leading to a physical injury or destruction of the article.</p>
	<p>■ <b>Do not use the product on an unstable table or a place that is subject to vibration.</b> That may cause the article to fall from the weighing pan, leading to a physical injury or destruction of the article. Besides inaccurate weighing may result.</p>
	<p>■ <b>Do not place an unstable sample on the weighing pan.</b> The sample may fall down and cause injury. Put an unstable article in a container (tare) before weighing it.</p>
	<p>■ <b>Do not use the product with the enclosures, cables, connectors or any external parts being damaged.</b> If those parts have damaged, be sure to disconnect the power supply box from mains power supply, then ask the store where you purchased the product or our sales department for repair. Keeping using the product may result in an explosion or fire. In addition, do not ever try to repair it for yourself, or very dangerous situation is likely to occur.</p>
	<p>■ <b>Do not use the product in an abnormal condition.</b> If it should happen that an abnormal event such as smoking or unusual odor occurs, ask the store where you purchased the product for repair. Keeping using the product may result in an electric shock or fire. In addition, do not ever try to repair it for yourself, or very dangerous situation is likely to occur.</p>

## **CAUTION**

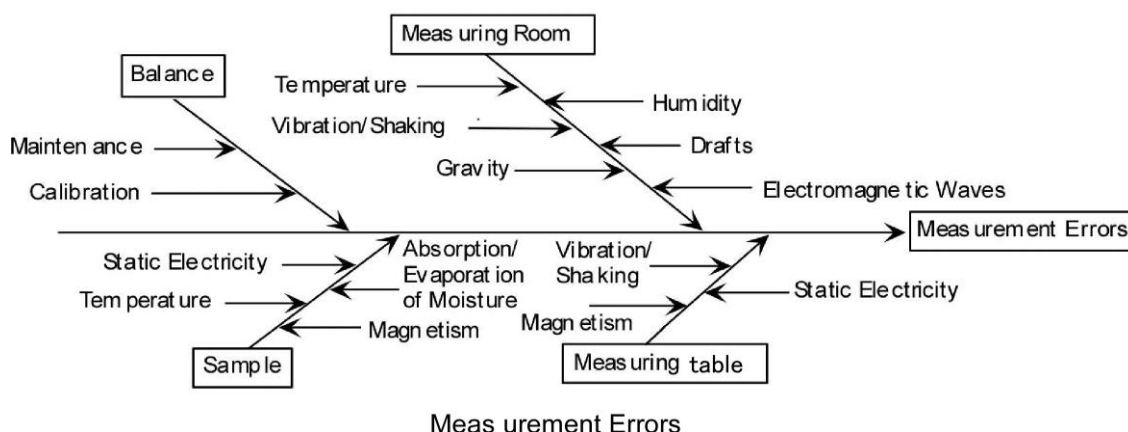
	<p>■ <b>Do not move the scale holding its windshield, indicator or pole.</b> That may cause base unit to fall, leading to a physical injury or malfunction of the scale itself. Be sure to hold the base unit to move it.</p>
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## Note

	<p>■ <b>Do not give a shock to the scale.</b> It may cause breakage or failure. Place an article to be weighed softly.</p> <p>■ <b>Do not use the product where there is direct sun.</b> Accurate weighing may be impeded due to the rise of internal temperature.</p> <p>■ <b>Do not let an overload situation (o-Err indication) continue.</b> It may cause breakage or failure. Remove the article to be weighed immediately.</p> <p>■ <b>Do not use volatile solvent.</b> Use of volatile solvent is likely to deform the product. Dirt on the product should be removed with a piece of dry cloth or cloth wet with small amount of neutral detergent.</p> <p>■ <b>Do not use the product where wind from an HVAC equipment directly applies.</b> Accurate weighing may be impeded due to the fluctuation of surrounding temperature.</p> <p>■ <b>Do not use the product where floor is soft.</b> Accurate weighing may be impeded due to the tilting of the weighing section when an object is placed on it.</p> <p>■ <b>Do not use the product where there is violent fluctuation of surrounding temperature or humidity.</b> Accurate weighing may possibly be impeded. Use within a temperature range of 5 to 40 °C and below a humidity of 85% RH.</p> <p>■ <b>Do not connect the scale cable with its connector or jack being wet.</b> It may cause a short-circuit or failure.</p>
	<p>■ <b>Be sure to make adjustment at the time of installation or changing a use place.</b> There occurs an error in measurement value. For the sake of accurate measurement, be sure to make adjustment.</p> <p>■ <b>Check for an error periodically.</b> Use environment and chronological change cause an error in measured value, leading to an inaccurate measurement.</p> <p>■ <b>Align the level of the scale without fail before use.</b> Weighing with a slanted scale causes an error, leading to an inaccurate measurement. Put the scale on a robust place.</p> <p>■ <b>Remove the battery when it will not be used for long time.</b></p>
	<p>■ <b>For proper disposal</b> This product including accessories may not be disposed of in domestic waste in conformance with the specific requirements in your country. When you dispose of this product, please contact your local authorities or dealer and ask for the correct method of disposal.</p>

## 1-2 For more accurate measurement

To make more accurate measurement, it is necessary to lessen error-causing factors in measurement to the extent possible. Error-causing factors include not only an instrument error and performance of the scale itself but also the nature and condition of a specimen, measuring environment (vibration, temperature, humidity, etc.) and the like. These factors will directly affect measurement result in the case of a scale with high resolution capability.



### 1-2-1 Precautions related to measuring environment

Temperature/humidity	→	Try to keep the room temperature constant to the extent possible in order to avoid condensation and indication drift due to change in temperature. → Low humidity is likely to cause generation of static electricity, resulting in inaccurate measurement.
Vibration/shaking	→	It is preferable to locate a measuring room on the first floor or the basement. The higher the room is, the larger the vibration and shaking become. Therefore a highly located room is not suitable for measurement. Rooms near the railway or roadside should also be avoided.
Air draft	→	Places directly exposed to air current from an air-conditioner or to direct sun generate abrupt temperature change and resultantly cause unstable weight indication, and therefore, should be avoided.
Gravity	→	The latitude and altitude of a measuring location differentiate the gravity that affects a specimen, giving a different weight indication to the same specimen.
Electromagnetic wave	→	At a location where a strong electromagnetic wave generating object is in the proximity of a scale, the scale is affected by the electromagnetic wave, making the scale unable to indicate accurate weight, and therefore, such a location should be avoided.

### 1-2-2 Precautions related to measuring table

Vibration/shaking	→	Vibrations during measurement destabilizes the indication of measurement value, leading to inability to make accurate measurement. And so use of a measurement table that is robust and hardly affected by vibration is required (a vibration-proof structured table or concrete or stone-made table is suitable). In addition, placing a sheet of soft cloth or paper under the scale causes shaking or makes keeping horizontal attitude difficult, and therefore should be avoided.
	→	The measurement table should be installed in a position free from vibration to the extent possible. A corner rather than the center of a room is less affected by vibration and therefore more suitable for installation of the scale.
Magnetism/Static electricity	→	Use of the scale on the table that is subject to magnetism or static electricity should be avoided.

### 1-2-3 Precautions related to a specimen

Static electricity	→	In general, synthetic resin- and glass-made specimens are high in electric insulation, and so easily charged electrically. Weighing an electrically charged specimen makes the indication value unstable, reducing the reproducibility of the test result. Therefore, neutralize an electrically charged specimen before measurement.
Magnetism	→	Specimens affected by magnetism show different weight in a different position of the weighing pan, reducing the reproducibility. When weighing a magnetized specimen, either eliminate the magnetism from the specimen or place a setting plate on the weighing pan to distance the specimen from the weighing mechanism of the scale so that the mechanism may not be affected by the magnetism.
Moisture absorption/Evaporation	→	Measuring a moist or evaporating (vaporizing) specimen increases or decreases the indication value of the scale continuously. When this is the case, put the specimen in a container equipped with a small mouth and closely seal the mouth before measurement.
Specimen temperature	→	Difference in temperature between the specimen and the windshield interior generates convection flow within the windshield, causing a measurement error. When the specimen temperature is excessively high or low, allow the specimen temperature to stabilize at the room temperature before measurement. Also, to prevent the convection flow from arising within the windshield, make the windshield interior temperature equal to the room temperature before measurement.
	→	Measurer's body temperature also affects measurement result. Handle a specimen with tweezers instead of directly holding it with fingers and refrain from putting your hands directly in the windshield during measuring operation.

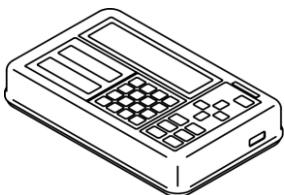
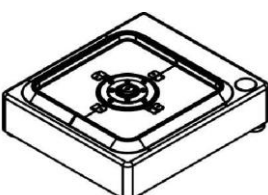
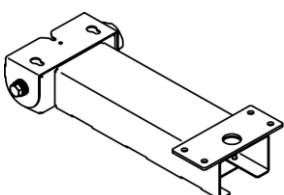

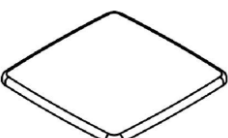

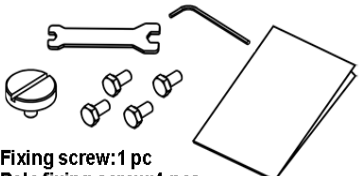
#### **1-2-4 Precautions related to the main unit of a scale**

Operating precautions	→	For more stable measurement, it is recommended to energize the scale for longer than 30 minutes and load the scale a few times with a weight equivalent to the weighing capacity before measurement.
Adjustment	→	Calibrate the scale periodically with an external adjustment weight. For the sake of precise calibration, use an external adjustment weight weighing nearly equal to the weighing capacity of the scale.
	→	Energize the scale for longer than 30 minutes and load the scale a few times with a weight equivalent to the weighing capacity before measurement
	→	Adjustment is also needed in the following cases: When using the scale for the first time, When using the scale after a long period of non-use, When changing a place of installation, and When there was a large change in temperature, humidity or atmospheric pressure.
Maintenance	→	Attachment of dirt such as powder or liquid to the weighing pan or pan base will cause measurement error or unstable weight indication. For that reason, frequent cleaning of the scale is required. In cleaning the scale, take care for the dust or liquid not to enter into the scale (mechanism).

### 1-3 Check for the articles contained in the box

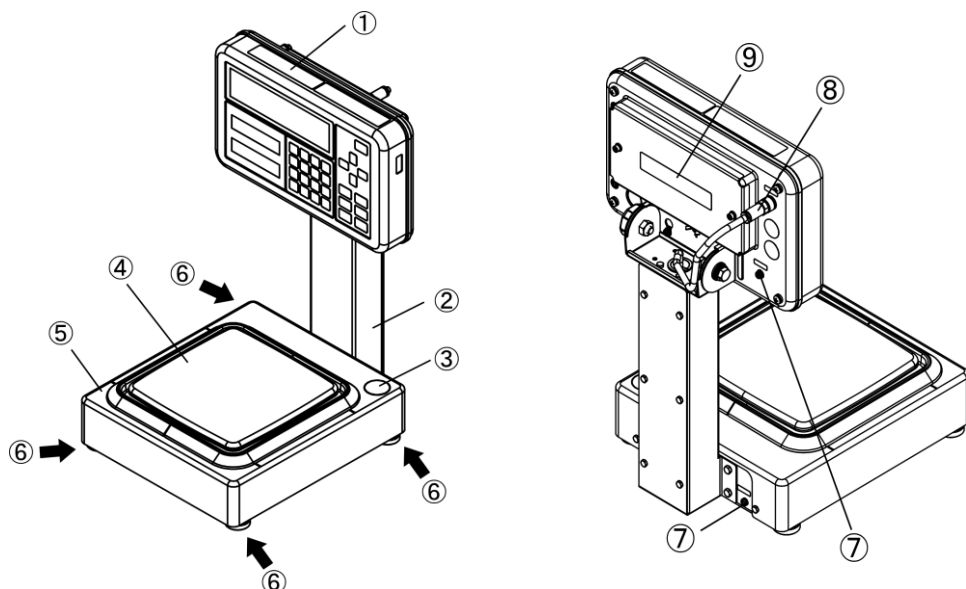
The package box contains the followings.

If anything missing or broken should be found, please inform the store where you purchased the product.

Part name	Q'ty	Part name	Q'ty
<b>① Indicator</b> 	1	<b>② Base unit</b> 	1
<b>③ Pole</b> 	1	<b>④ Pan base</b> 	1
<b>⑤ Weighing pan</b> 	1	<b>⑥ R20P Panasonic dry batteries</b> 	4
<b>⑦ Accessories</b>  <p>           Fixing screw:1 pc            Pole fixing screw:4 pcs            Spanner:1 pc            Manual:2 pcs            Hexagonal wrench:1 pc         </p>			



1-4	Name and function of each section
-----	-----------------------------------



①	Indicator	②	Pole
③	Level	④	Weighing pan
⑤	Base unit	⑥	Adjuster
⑦	Enclosure grounding terminal	⑧	Scale cable
⑨	Dry cell battery holder		

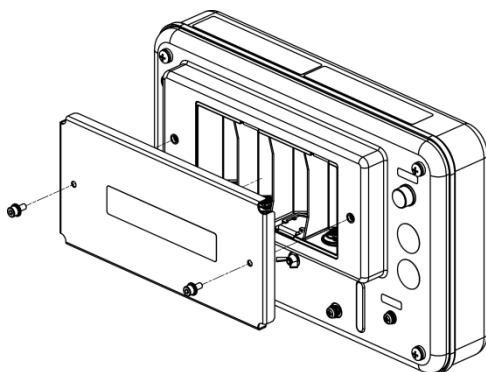
## 1-5 Assembling and installation of the scale

### 1-5-1 Setting the dry batteries in the indicator



- Do not disconnect the display from the scale in the hazardous area.
- Battery replacement should be done in the safe area.
- Only use R20P Panasonic dry batteries.
- Do not set dry batteries inversely.

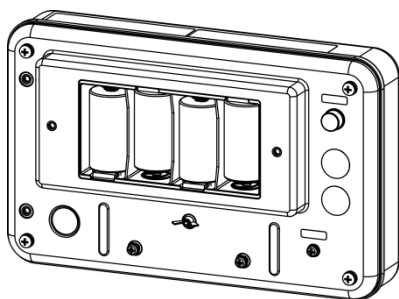
#### 1 Detach the dry battery holder.



(1)

Detach the dry battery holder using the supplied hexagonal wrench.

#### 2 Set dry batteries.



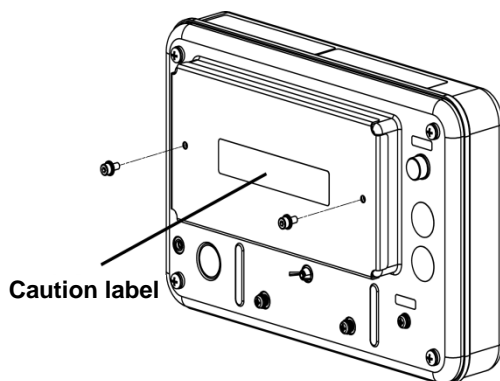
(1)

Set the supplied size D zinc-carbon dry batteries as noted on the battery box.

#### Reference

Supplied dry batteries are for checking the operation.

#### 3 Attach the dry battery holder.



(1)

Attach the dry battery holder using the supplied hexagonal wrench.

#### Note

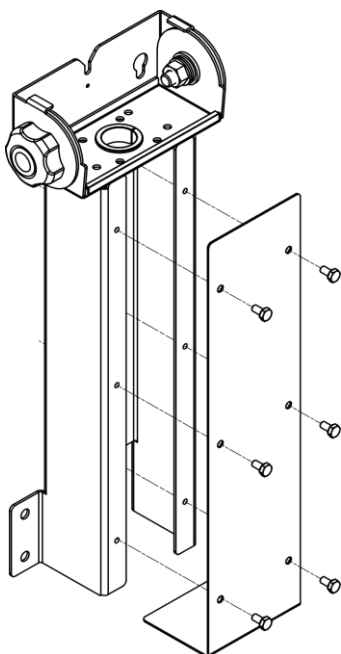
Attach the battery holder with the letters of the caution label facing upward.

## 1-5-2 How to mount the pole and the indicator

Reference

When not using the pole, proceed to step 5.

### 1 Remove the pole cover.



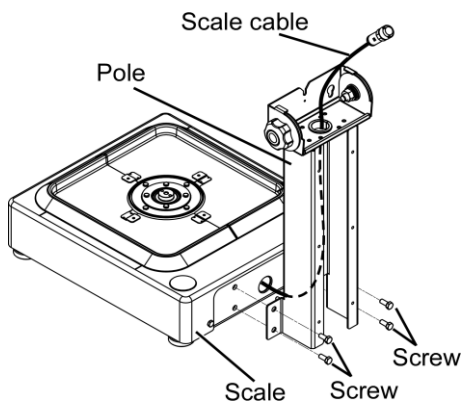
(1)

Remove six screws from the pole with a spanner which comes with the scale.

(2)

Remove the pole cover.

### 2 Mount the pole on the scale.



(1)

Put the scale cable that comes out of the scale through the pole.

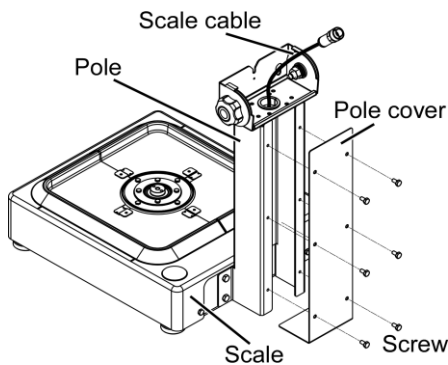
(2)

Fix the pole and the scale with the attached screws temporarily.

(3)

Tighten the screws to fix the pole securely with the spanner which comes with the scale.

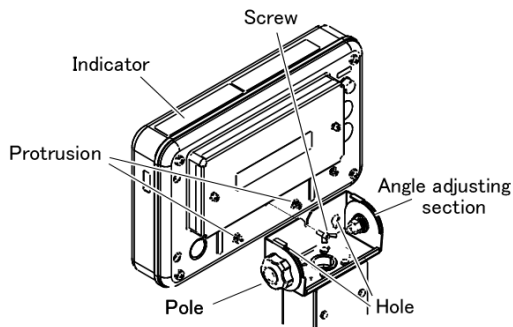
### 3 Mount the pole cover.



(1)  
Mount the pole cover with the removed six screws temporarily.

(2)  
Tighten the screws with the spanner which comes with the scale to fix the pole cover.

### 4 Mount the indicator on the pole.

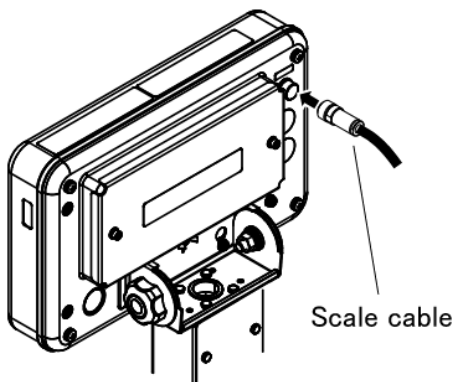


Insert into the hole      Push down to fix

(1)  
Put two protuberances located in the lower portion of the back of the indicator into the holes of the angle adjusting section, and then push down the indicator.

(2)  
Fix the indicator with screws.

### 5 Connect the scale cables to the indicator.



(1)  
Insert the scale cable and tighten the connector screw by hand.

#### Reference

When not using the pole, connect the scale cable directly to the indicator.

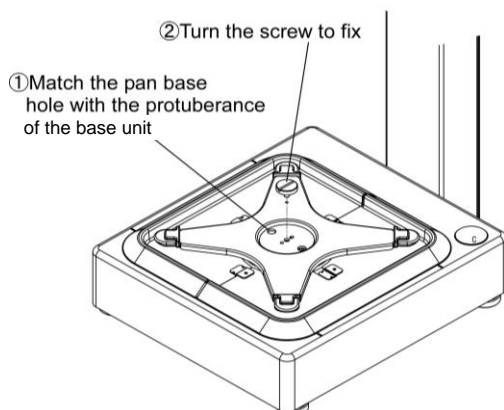
#### Note

Tighten the connector screw securely by hand for protection against dust and water.

To prevent damage to the connector, do not use tools when tightening.

### 1-5-3 Mounting of the pan base and the weighing pan

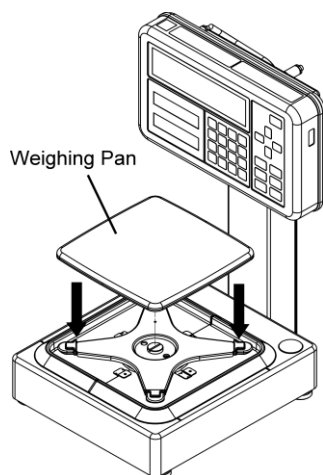
#### 1 Mount the pan base on the scale.



(1)

Put the pan base on the base unit with the pan base hole matched up with the protuberance of the base unit, and then turn the screw with a coin or the like to fix it. Do not turn it excessively.

#### 2 Mount the weighing pan.



(1)

Place the weighing pan on the pan base.

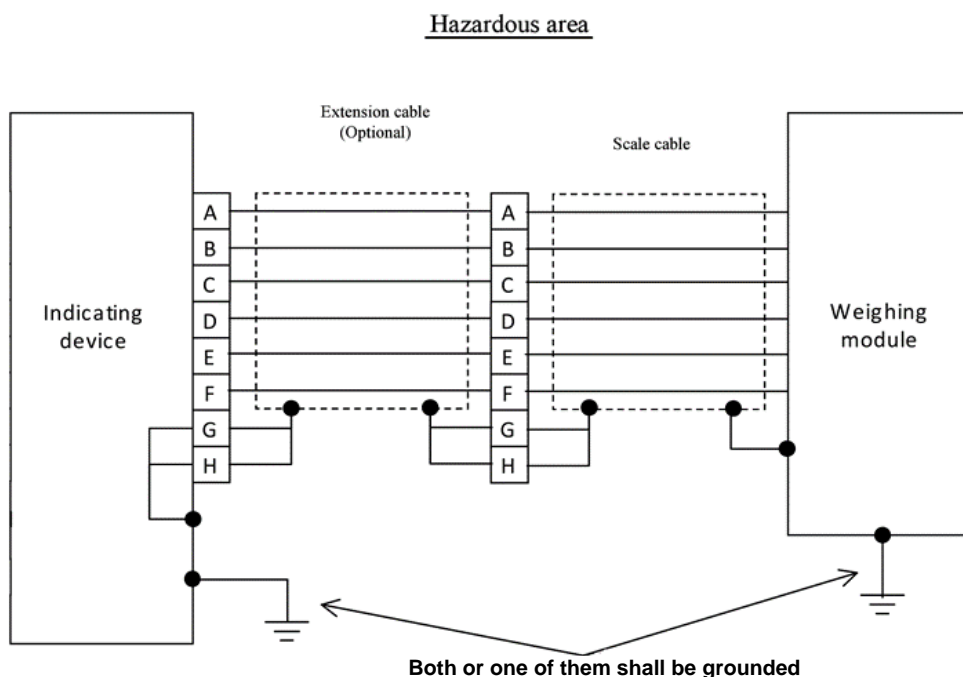
## 1-5-4 Installation

### 1 Installation conditions

This product is a scale safe to use in flammable gas atmosphere. However, it is very dangerous if any mistakes are made with the installation work and handling.

#### WARNING

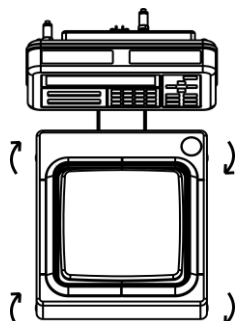
- Separate the scale cable from wiring cables including the motor power line. Provide wiring with enough distance for separation since static induction and electromagnetic induction may be applied and damage the intrinsically safe explosion-proof performance.



1. Install a weight indicator and weight measuring device by composing as shown in the drawing.
2. Four batteries described below shall be set in series in the product.  
Replacement of batteries is prohibited in hazardous areas.  
Battery type: Size D zinc-carbon batteries (primary battery)  
Model: R20P    Manufacturer: Panasonic Corporation  
Nominal voltage: 1.5 V  
Maximum open circuit voltage when using:  $1.725 \text{ V} \times 4 \text{ batteries} = 6.9 \text{ V}$
3. Specification conditions of dedicated cable (scale cable and scale extension cable)  
Total of inductance: 0.1 mH or less  
Total of capacitance: 0.02  $\mu\text{F}$  or less
4. Wires to connect the weight indicator, weight measuring device and other devices shall be allocated not to induce current and voltage to the intrinsically safe main circuit that may damage the intrinsically safe explosion-proof performance of the intrinsically safe main circuit by electromagnetic induction or electrostatic induction.

## 1-5-5 Leveling

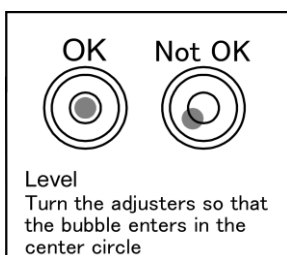
### 1 Release the transportation lock of the adjuster.



(1)

At the time of shipment, the adjusters provided at the four corners of the bottom are locked. Turn them in the direction shown in the figure on the left to loosen them.

### 2 Level the scale.



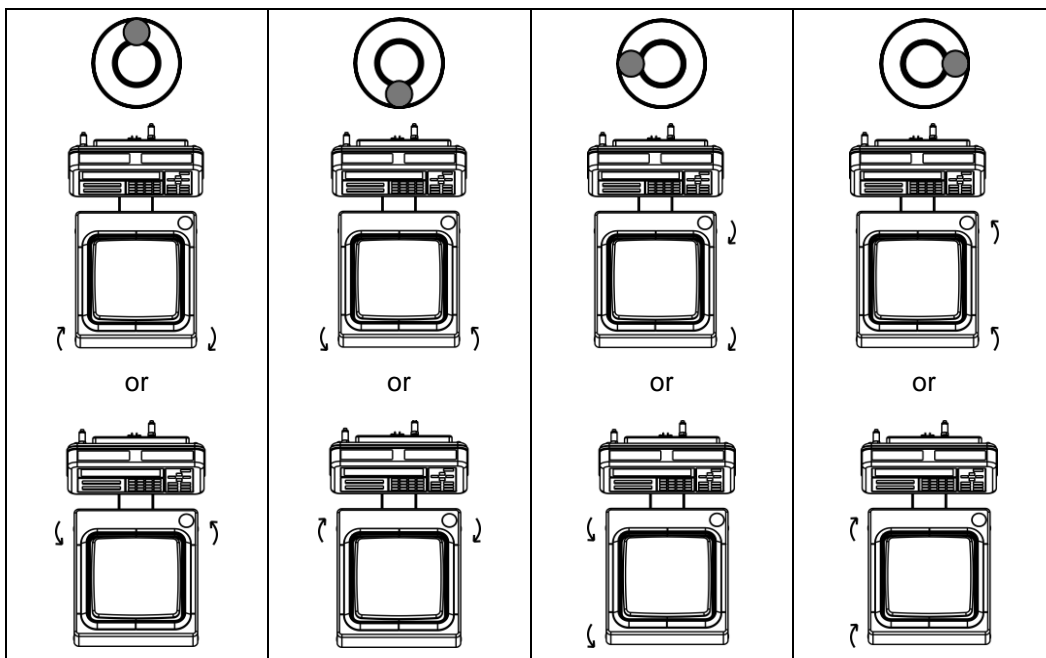
(1)

Turn the adjusters and bring the bubble enters in the center circle as shown in the figure on the left.

(2)

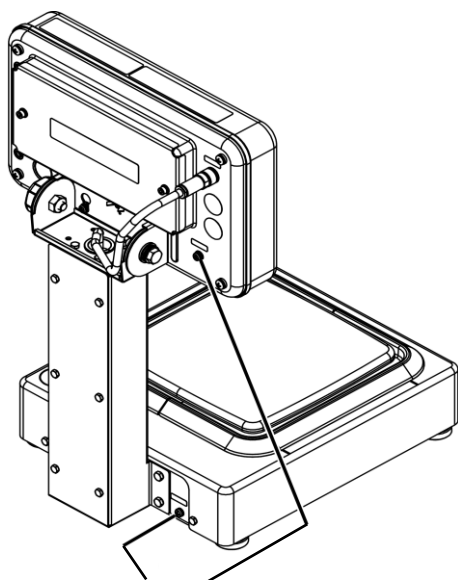
When having leveled the weighing section, slightly push the four corners of the scale to make sure that there is no rattle.

Turn the adjusters as shown below depending on the position of the bubble in the level.



## 1-5-6 Grounding

### 1 Connect a grounding terminal.



Enclosure grounding terminal

In this product, the internal circuit is electrically connected with the enclosure.



For the purpose of safe use, be sure to observe the following grounding conditions in grounding this product.

(1)

Ground both or one of the Enclosure grounding terminals.



## 2 How to maintain

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Keep the following in mind in maintaining this product.

### **2-1 Maintenance method**

Wipe dirt with dry and soft cloth off the weighing section and the indicator section.

### **2-2 Maintenance method in the case of heavy soil**

In the case of heavy soil, remove the weighing pan and/or the indicator section and clean it with a piece of cloth slightly wet with neutral detergent or solvent. In the case of being extremely dirtied, wash the dirt off and then wipe it adequately with dry cloth.

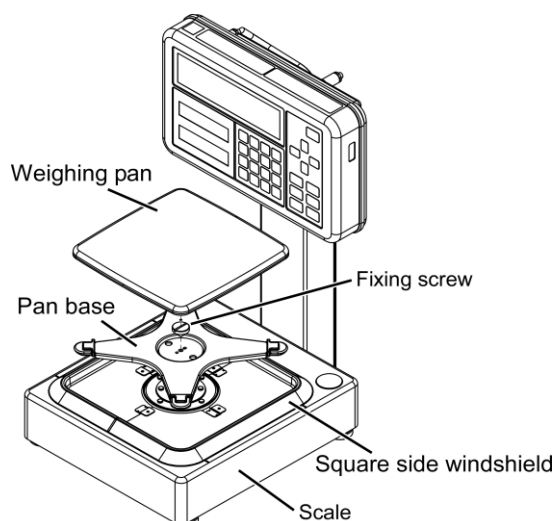
To remove the indicator section from the weighing section, refer to “Assembling and installation of the scale.”

#### **Note**

- Removing a part other than the one referred to in this document will impair the function of the product, leading to a failure. Please note that we will not take any responsibility for the consequence resulting from such removal.
- When washing with water, take care not to submerge the weighing section and indicator section.
- The scale is compliant with IPX5 only when the “Square side windshield”, “Pan base” and “Weighing pan” are mounted on it.

## 2-2-1 How to remove the side windshield

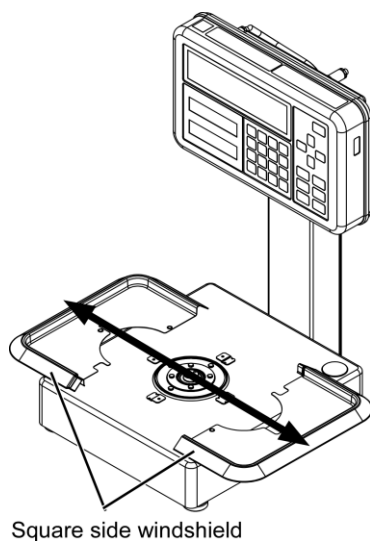
### 1 Remove the weighing pan and the pan base from the scale.



(1)

Remove in the order of the weighing pan, the fixing screw and the pan base.

### 2 Remove the square side windshield.



(1)

Open the square side windshield right and left to remove it.


# Appendix

## Appendix 1 Specification

### Appendix 1-1 Metrological specification

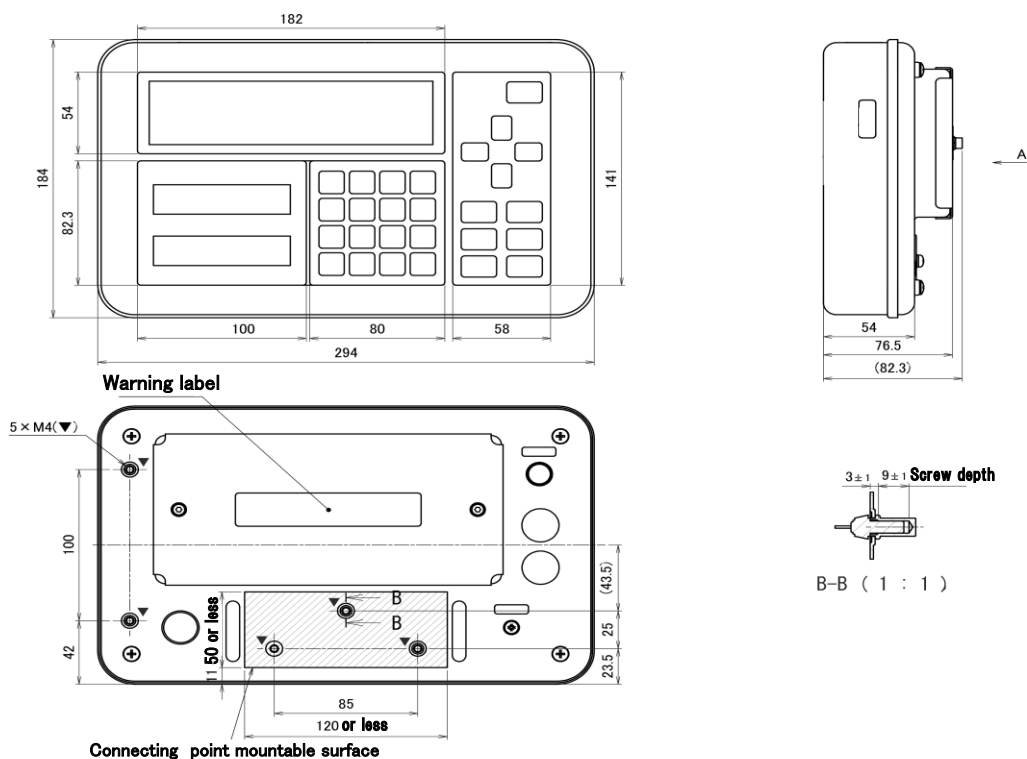
Model name	Max (g)	d (g)	Weighing pan size (mm)
FZ-B3200	3200	0.01	190 x 190
FZ-B6200	6200	0.01	
FZ-B15000	15000	0.1	

### Appendix 1-2 Functional specification

Weighing system	Tuning fork vibration type		
Protection class	IP65 (Weighing section and Indicator section)		
Main unit weight (NET)	Weighing section	FZ-B3200, FZ-B6200, FZ-B15000	Approx 5.8 kg
	Indicator section	i02	Approx 1.7 kg
		i03	Approx 1.8 kg
Package weight (GROSS)	FZ-B3200, FZ-B6200, FZ-B15000		Approx 10.5 kg
Standard cable length	Scale cable		1 m
Operating temperature and humidity	Temperature: Weighing section and Indicator section: +5 °C to +40 °C Humidity: 85%RH or lower (no condensation nor frost)		
Altitude	2000 m or less above sea level		
Overvoltage category	II		
Pollution degree	Indicator and weighing section: 3		
Location of use	Indoor use only		
Option	FJ pole stand FJ table stand Scale extension cable		
Power source	D type zinc-carbon dry cell x 4 pcs. (R20P Panasonic) 4.0 to 6.0 V 		

## Appendix 1-3 Outline drawing

### Indicator section



### ■FZ-B3200, FZ-B6200, FZ-B15000

