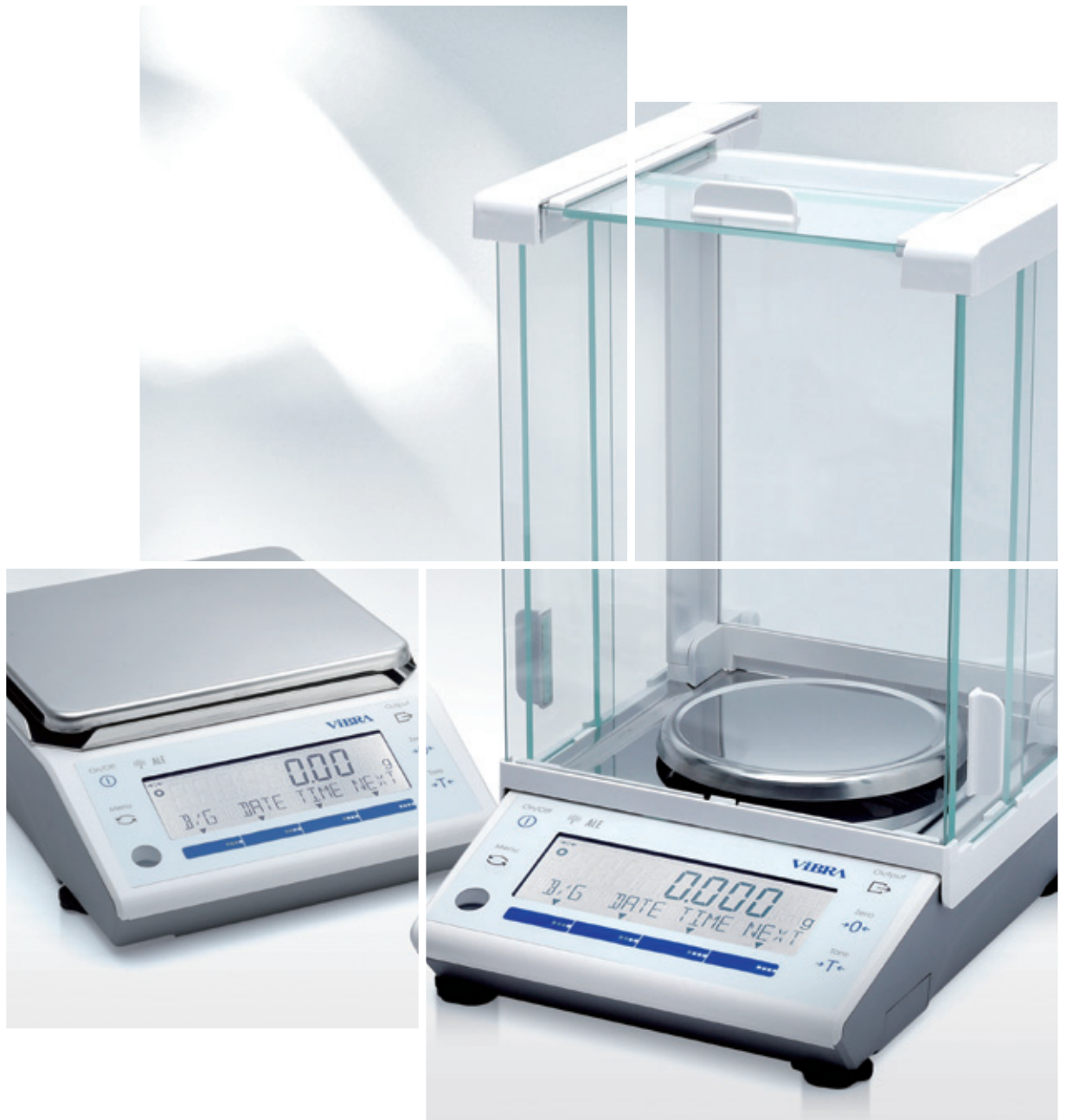


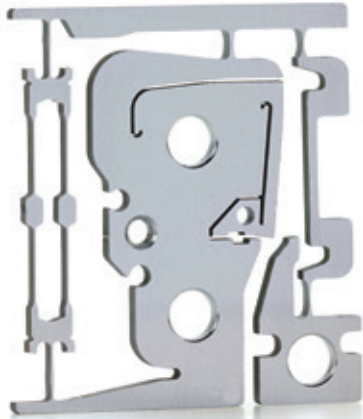
# Products Catalogue

Vol.3



Core competence of Shinko Denshi

# Tuning Fork sensor, Only one “technology in the world.”



Sensor part cutout from one-piece metal alloy using sub-micron processing accuracy.

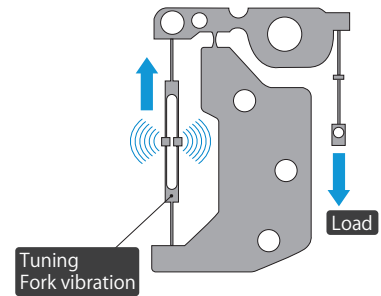
Shinko Denshi always pursue spirit of innovation and originality, thus released world and Japan first products into the market. Amongst many Shinko Denshi products, Tuning Fork, utilizing vibration frequency of tuning fork commonly used to tune music instruments and corresponding to the industry needs require high accuracy weighing and measurement, is the only one technology in the world which Shinko Denshi is proud of.



## Sensor part cutout from one-piece metal alloy using sub-micron processing accuracy.

Measure frequency upon applied weight

Tuning Fork vibration frequency is extremely accurate. That is why it is used for tuning of music instruments. Force Sensor detects change of tuning fork frequency which corresponds to weight, then convert into weight value. Frequency is determined by shape and material used for tuning fork, resulting the consistency against temperature change, durability for secular change, high accuracy and robustness



### Durable and Long Life

Simple mechanism with less parts, durability with no trouble for long time. Save troublesome maintenance work.

### High Scale Capacity High Resolution Capability

Realize the wide measuring range scale which is relatively difficult in other type scale sensor. In production, we can provide one scale with Tuning fork sensor, instead of two big and small capacity's scales.

### Power Saving

Power consumption is one in couple tenth of strain gage type. Suitable for Battery operation since the necessary energy consumption is minimum. As it has almost no heat development, even work place with dangerous materials can use this scale.

## Six Advantages of Tuning Fork Sensor

### Insusceptible to noise

The output of Tuning Fork sensor is a digital signal so that it has high S/N ratio and hardly susceptible to noise. It has less flickering, thus achieves the stable indication even for micro-weight.

### No warm-up periods

Tuning Fork sensor has minimum weighing error by temperature alteration and in addition there is no warm-up periods. It can be used immediately after power on.

\* Warm-up period varies depend on products and usage circumstances.

### No decline in the span adjustment

Normal scale requires scheduled span adjustment to keep its accuracy, but as Tuning Fork sensor's material and shape dimension remains unchanged, the span adjustment of Tuning Fork sensor also remains unchanged, thus can be used with long-term stability.

# Technology supporting “SUBARU” astronomical telescope watching for 13.8 billion years away.

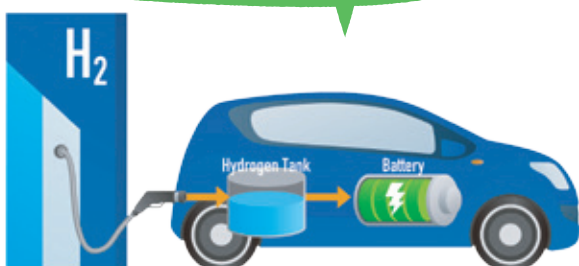
Shinko Denshi made Tuning Fork sensor are used in SUBARU astronomical telescope, the world largest optical outer red telescope, build on the summit of Mauna Kea Hawaii in 2000 by National Astronomical Observatory of Japan.

“SUBARU” reflector mirror performing astronomical observation corresponding to the movement of stars weighs 23 metric tons. It loses focus due to deformation by its own weight when changing its force direction. In order to compensate the deformation, it requires super accuracy sensor which measures the micro change: 1g against 150kg weight. Under the circumstance of top of the 4,000 meter high mountain, large difference in temperature day or night, and hardly perform maintenance work, there is no other equipment but Shinko Denshi Tuning Fork sensor. Implementing total 261 pieces of Tuning Fork sensor, which supports 90 kg weight per piece, are still performing its full function to unravel space mystery without no maintenance whatsoever since its installation in year of 2000.



SUBARU Optional Telescope© NAOJ

Contribute to Hydrogen Energy Society with Tuning Fork sensor:



Currently spotlighted Hydrogen energy as environment friendly fuel. Hydrogen itself is very light weight but its container is heavy so that in order to perform weighing accurately, large capacity yet fine resolution weighing apparatus is necessary. Also, hydrogen is hazardous material so that explosion-proof is crucial factor. To fulfill these several conditions, Shinko Denshi’s Tuning Fork sensor is the only one available. We contribute to the environment conscious new society with only one technology for which only Shinko Denshi can realize.

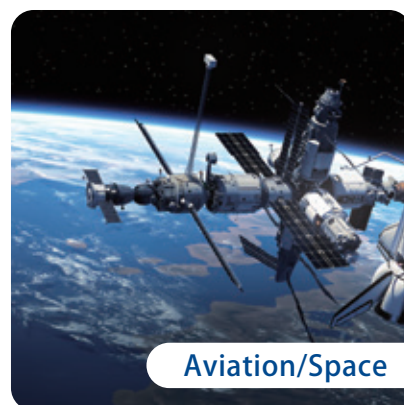
# Contribute widely in various fields.

Not only physical/chemical science and industrial field, but also logistics and space industry. Shinko Denshi is responding to automation in the production venue.

High performance yet durable ViBRA scales are leveraged in various markets other than overwhelmingly supported pharmaceutical and explosion-proof markets.

In fact, as well as Physical and Chemical field where research development is conducted by enterprises and/or educational institutes, Shinko Denshi contributes automated production line in the industry field to make up for shortfall in human resource with dynamic weighing scales

High accuracy of ViBRA scales have received recognition in various venues where scale feature/function is requested.

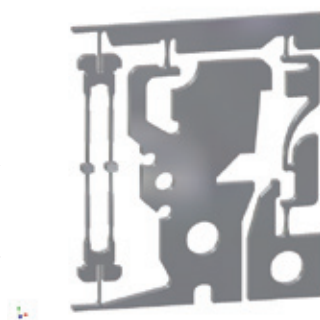


# Support customer with only-one technology

Shinko Denshi provides “Long Life/Accurate/Reassured” scales for use in pursuing convenience/user-friendliness and functionality.

## 1 "Tuning Fork sensor", Only one technology in the world

Measure frequency upon applied weight. Tuning Fork vibration frequency is extremely accurate. That is why it is used for tuning of music instruments. Force Sensor detects change of tuning fork frequency which corresponds to weight, then convert into weight value. Frequency is determined by shape and material used for tuning fork, resulting the consistency against temperature change, durability for secular change, high accuracy and robustness.

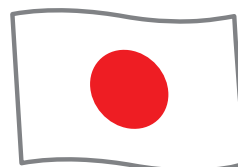


## “Made in Japan” products. Consolidated work from R&D to Production.

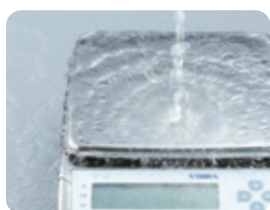
To materialize engineer’s idea, professional Meister skill is inevitable.

Shinko Denshi, having unique production techniques, dwells on Japan domestic production to assure and maintain highest quality.

# 2



Made In Japan



## Heavy Duty; the Professional-Caliber

Shinko Denshi is to provide the products with toughness and long-term stability for heavy-duty usage. Especially for explosion-proof, dust-proof and water-proof products, which complies with International or national Standard, Shinko Denshi has gained an implicit credence.

# 3

## Measure the future by the technology continuously producing the world first.

Shinko Denshi’s DNA is “the Challenge” spirit which produce world first products such as Counting Scale or Explosion-proof Electronic scale. Shinko Denshi contribute to the society with keep providing products responding to the customer’s needs



# Index for products searches

○...Standard

▲...Option

※It may vary according to a model.  
Please check on product pages for more details.

## Semi-micro & Analytical balance

## Precision balance



P10



P12



P14



P16

List of publication function items	LF	HT	ALE	AJ
Capacity	92g-220g	80g-220g	220g-15000g	320g-12kg
Readability	0.01mg-0.1mg	0.1mg	1mg-0.1g	0.001g-0.1g
Tuning-fork sensor		○	○	○
Strain gauge load cell				
Electro-magnetic sensor	○			
LCD display				
Back-light LCD display	○	○	○	○
Fluorescent display				
Switching function for min. readability	○	○	○	○
Double range	○			
Direction Key				
Comparator Function	○	○	○	○
Add/Accumlate Function	○	○	○	
Bar Graph Display	○	○	○	○
Internal calibration weight	○	○ (HTR)	○ (ALE-R)	○ (AJH)
Counting mode	○	○	○	○
Percent mode	○	○	○	○
Coefficient Mode	○	○	○	
Specific Gravity Mode	○	○	○	
Animal weighing mode			○	
Statistic Calculation Mode	○		○	
RS232C output	○	○	○	○
Printer output		○		
USB output	○		○	
ISO/GLP/GMP corresponding print	○	○	○	
Clock/Calendar Function	○	○	○	
Under weighing	○	○	○	▲
Rechargeable battery				▲
Dry-cell battery			○	
IP65				
Hold display mode			○	

Precision balance



P17






P18



P19

CJ	AB	SJ
820g-15kg	320g-12kg	220g-12kg
0.01g-1g	0.001g-0.1g	0.01g-1g
○	○	○
○	○	○
○	○	○
○		
○	○	○
	○ (AB-R)	
○	○	○
○	○	○
○		
○		
○		
○	○	▲
○		
○		▲
		▲
▲	▲	
○		

	Platform Scale		Ex-proof scale
	 P24	 P26	 P28
List of publication function items	HJK	FS	FZ
Capacity	17kg-62kg	620g-300kg	620g-300kg
Readability	0.1g-1g	0.001g-1g	0.001g-1g
Tuning-fork sensor	○	○	○
Strain gauge load cell			
Electro-magnetic sensor			
LCD display			○
Back-light LCD display		○	
Fluorescent display	○		
Switching function for min. readability	○	○	○
Double range	○ (HJ-62K(R))		
Direction Key	○	○	○
Comparator Function	○	○	○
Add/Accumlate Function	○	○	○
Bar Graph Display	○	○	○
Internal calibration weight	○ (HJKR)		
Counting mode	○		
Percent mode	○	○	○
Coefficient Mode		○	○
Specific Gravity Mode		○	○
Animal weighing mode			
Statistic Calculation Mode		○	○
RS232C output	○	○	○
Printer output	○	○	
USB output			
ISO/GLP/GMP corresponding print	○	○	○
Clock/Calendar Function	○	○	○
Under weighing	○		
Rechargeable battery	▲		
Dry-cell battery		○	
IP65	○	○	○
Hold display mode			

○...Standard

▲...Option

※It may vary according to a model.  
Please check on product pages for more details.



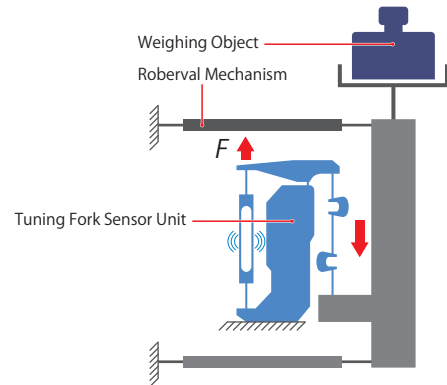
## Embedded Sensor

Shinko Denshi is the only company who is selecting sensors from 3 different types.

Utilizing each sensor's characteristics, Shinko Denshi has deployed wider range products corresponding to the resolution, price and customer's needs.

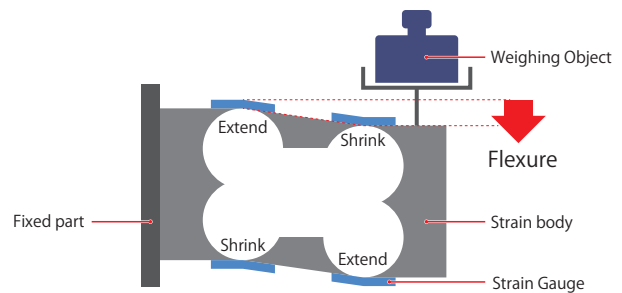
### Tuning Fork sensor — No trouble with high accuracy and fast response time. —

Vibration frequency changes against the application of load to two piece coupled Tuning Fork. Scale measures this frequency change then convert to the weight value. Stress-strain of the Tuning Fork is 1/10th and its output sensitivity is 50 times of Strain Gauge. This gives enormous difference in scale performance, such as resolution, stability and repeatability.



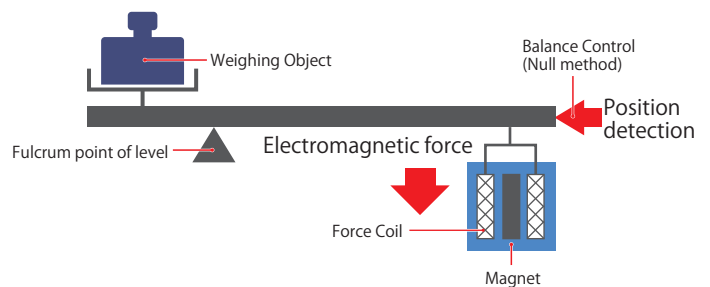
### Strain Gauge Sensor — Suitable for relatively heavy item and it is durable. —

Applying load to Strain Gauge affixed metal makes gauge's resistor value change by metal strain. Strain Gauge type sensor measures the change of resistor value then convert into weight value. Structure of the sensor is relatively simple so that sensor cost is inexpensive, thus the sensor is suitable for heavy weight measurement.



### Electromagnetic Sensor — Suitable for weighing of extreme light weight and/or micro piece. —

Electromagnetic force, raised by the combination of Magnet and Coil, makes in balance of applied load. Sensor measures the current flow in the coil to determine weight value. It is suitable for high accuracy (high resolution) measurement. It has been noted as suitable for smaller capacity and high-resolution weighing.



	Tuning Fork Sensor	Strain Gauge Sensor	Electromagnetic Sensor
Scale capacity	80g to 300kg	Few Hundred gram to few metric tons	Few grams to few kgs
Actual resolution	>1/3,000,000	>1/20,000	>1/60,000,000
Long-term stability (Example of span shift by year base)	High (1/200,000)	Low (1/10,000)	Normal (1/50,000)
A/D Conversion (Analogue/Digital)	N/A (Digital output)	Necessary (Analogue output)	Necessary (Analogue output)
Power consumption of Sensor	Extremely small (less than few percent of Strain Gauge type sensor)	Small	Large
Noise resistance	Strong	Weak	Normal
Warming up	Unnecessary (depend upon products and usage circumstances)	Necessary	Necessary

## Eye-friendly display



### LCD display

Crisp and clear contrast LCD display.



### Back-light LCD display

It equipped back-light in the LCD so that indication is visible even in the dark.



### Fluorescent display

Fluorescent display visible in the dark.

## Various modes

### Counting mode

Able to count piece with simple and easy sampling operation

### Perxent mode

Indicate the ratio (%) against the set reference weight

### Carat mode

Indicate in Carat (ct) for jewel measurement

### Momme mode

Indicate Monme (mom) for Pearl weight measurement.

### Coefficient mode

Indicate calculation result of weight value multiplied with any value.

### Specific gravity mode

Indicate specific gravity value with measuring weight in the air and in the water.

### Animal weighing mode

Function to weigh ambulant animals with accuracy.

### Statistics calculation mode

Functions indicating statistic value like maximum or average.

## Plenty functions

### Stand-by function

Stand-by/sleep function, the scale can be used immediately after main power on.

### Switching function of min. readability

Indication changeover function for selecting minimum readability unit.

### Double range

Min display unit changes automatically when applied load exceed smaller range capacity.

### Comparator (Limit) function

3 ranks discrimination is possible with setting two points (Upper limit and Lower limit).

### Accumulative Adding function

Indicate addition or accumulation result of measured result.

### Bar-Graph indication

Indicate by Bar-Graph the measured weight value occupancy to scale capacity.

### Built-in calibration weight

Calibration weight is built-in so that manual span adjustment can be done easily by means of dial or knob.

### Built-in automatic calibration weight

Motor-driven type calibration weight is built-in so that automatic span adjustment is performed by single key depression.

### RS232C Output

Able to connect to computer or printer which RS-232C interface is built-in.

### Printer output

Shinko Denshi's exclusive printer CSP-160II or can be connected to scales.

### ISO/GLP/GMP compliant printing

Simply connect to CSP-160 II or printer, then ISO/GLP/GMP compliant printing becomes available.

### Clock/Calendar function

Date and time can be set to built-in Date/Time function. When exclusive printer is connected, data can be printed with date and time information.

### Warning by Buzzer

Notify Limit function discrimination result by buzzer (mega volume type available) sound.

### Display Unit angle adjustment

Able to adjust angle of display unit to visible angle position.

### Under weight

Able to weigh beneath the floor weighing suitable for gravity measurement.

### Battery Drive

Able to weigh things at anywhere, driven by exclusive rechargeable battery unit.

### Dry-Call Battery drive

Able to weigh anywhere by dry battery drive.

### IP65 Standard compliant dust-proof and water-proof structure.

Able to weigh under splashing water or dusty work place. The structure is IP65 compliant, dust-proof and water-proof.

Comparator function

Bar-Graph display



Balance

Capacity : 92g - 220g / Readability(d) : 0.01mg-0.1mg

Back-light LCD display

Under weighing

Windshield

# LF series Semi-micro Balance

Electro-magnetic Sensor

**Thoroughly pursued the User-friendliness**  
Semi-micro Balance with Readability 0.00001g (0.01 mg)

### Features

- Automatic Span Adjustment Function to keep maintain high accuracy  
Advice CAL function to notify proper calibration timing
- Combination Door which opens to left/right/double door
- Windshield designed for wide and space saving
- Large and eye-friendly display unit with back-light
- Able to use as Counting Scale
- Standard equipped USB Output



### Common Specification

- Tare Zero to Full weighing range
- Span adjustment Automatic and semi-automatic Span Adjustment with built-in calibration weight
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 10-30°C, Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output 5.95VDC
- Output RS232C output (D-sub 9pin)  
USB output

Model name	LF225DR		LF224R
Capacity	92g	220g	220g
Readability (d)	0.01mg	0.1mg	0.1mg
Repeatability	0.02mg	0.1mg	0.1mg
Linearity	± 0.03mg	± 0.2mg	± 0.2mg
Stabilization time	5.0 sec.	3.0 sec.	3.0 sec.
Pan size	80mm dia		
Dimensions(WDH)	210 × 320 × 335mm (Including Windshield)		

### Options

Models	Option name
LFDK	Density measurement kit

### Peripheral equipment

Models	Option name
CSP-160 II *	Statistics Printer
CBM-910 II	Standard Printer
LAS-05D-SD	"No wind" Ionizer



Density measurement kit



"No wind" Ionizing blower

\* Not available to use in EEA, Switzerland & Turkey.

Semi-micro Balance

Counting Mode

Percent Mode

Carat Mode

Monme Mode

Coefficient Mode

Specific Gravity Mode

Animal weighing mode

Statistic Calculation Mode

Stand-by Function

Switching function for min. readability

Display function for actual readability

Switching of Scale range

Double Range

Direction key

Comparator Function

Add/Accumulate Function

Bar Graph Display

Built-in Calibration Weight

RS-232C Output

Printer Output

SO/GLP/GMP corresponding print

Clock/Calendar Function

Buzzer Alarm

RTS Free Download

## Outclassing usage of Windshield unit

In keeping wider space of scale capacity, wind shield is a two step slide door type, so that no flared section comes out from backside. It is a space saving design. Because it is a combination door, it can open to left/right/double side and close by one hand. Able to achieve operational efficiency with using both hands.

## Full Automatic Span Adjustment function to keep high-accuracy

Full-automatic Span Adjustment function, which automatically detect a shift in the environment like ambient temperature change or lomger time usagea and calibrate (span adjustment) scale, is equipped. Periodic calibration maintains high-accuracy of the scale. In addition, Advice CAL function to inform the timing of calibration makes calibration easier.



## Variety weighing mode

Weighing mode setting for gravity, percent, counting and jewellery scale. Reliable scale with variety weighing modes in small body enclosure.

- **Measurement mode**
  - Weighing mode(g)
  - Counting Mode(Pcs)
  - Percent Mode(%)
  - Coefficient mode (#)
  - Momme Mode(mom)
  - Carat Mode(ct)
- **Specific Gravity Mode**
- **Statistic Calculation Mode**



## Standard equipped RS-232C and USB

Bidirectional RS-232C output and USB are standard equipped. Able to communicate with peripheral equipment, like printer etc, or PC.

## Print date and time with ISO/GLP/GMP compliant format

Able to print calibration records in ISO/GLP/GMP compliant format with date and time stamp when Shinko printer is connected.

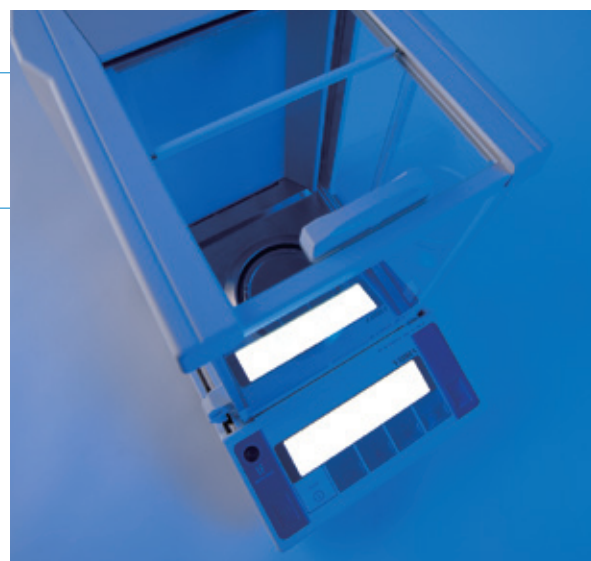


## Bar graph display to indicate available weighing range.

Usage status to scale capacity is displayed in 40 fraction bar graph. Able to grasp the remaining weighing range at glance.

## Large display unit with back-light

Large and eye-friendly LCD display with 16.5 mm character hight can still read off in the dark workplace.



Capacity : 80g - 220g / Readability(d) : 0.1mg(0.0001g)

Back-light LCD display

Under weighing

Windshield

# HT series Analytical Balance

Tuning-fork sensor

World-first!! Analytical Balance with Tuning Fork sensor  
Revolutional performance outreaches the common sense of Analytical Balance field.



## Features

- Resolution: 1/2,200,000
- Built-in calibration weight for Automatic and semi-automatic Span Adjustment(HT-R)
- Light weight: Gross weight is reduced with approx. 50%
- Compact: overall size is approx. 60% shrunk
- Shorten warm-up time (reduced with approx. 90%)
- Correspondence product for Free Download Data Acquisition software

\* Data is the comparison result with Shinko one generation older products (same capacity, same min-graduation, force balance type analytical balance with built-in calibration weight)

## Common Specification

- Tare Zero to Full weighing range
- Span adjustment HT-R.....Automatic and semi-automatic Span Adjustment with built-in calibration weight  
HT.....Manual operation Span Adjustment with external calibration weight
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 10-30°C、Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output 12VDC
- Output RS232C & peripheral device output

Model name	HT84RCEN	HT124RCEN	HT224RCEN	HT84CEN	HT124CEN	HT224CEN
Capacity	80g	120g	220g	80g	120g	220g
Readability (d)	0.1mg	0.1mg	0.1mg	0.1mg	0.1mg	0.1mg
Verification intervals (e)	1mg	1mg	1mg	1mg	1mg	1mg
Accuracy class	I	I	I	I	I	I
Repeatability	0.1mg	0.1mg	0.1mg	0.1mg	0.1mg	0.1mg
Linearity	± 0.3mg	± 0.3mg	± 0.3mg	± 0.3mg	± 0.3mg	± 0.3mg
Stabilization time	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.
Pan size	80mm dia					
Dimensions(WDH)	213 × 290 × 314mm (Including Windshield)					

## Options

Models	Option name
HTDK	Density measurement kit

\* not available for Verified model

## Peripheral equipment

Models	Option name
CSP-160 II*	Statistics Printer
CBM-910 II	Standard Printer
LAS-05D-SD	"No wind" Ionizer

\* Not available to use in EEA, Switzerland & Turkey.



"No wind" Ionizer

## Tuning-fork sensor inside, Only one analytical balance in the world

VIBRA HT series provides outstanding advantages to analytical weighing with tuning-fork sensor. The most remarkable features are sustainably high quality weighing performance and high durability in the long run. Since these are inherent in the principle and the design of tuning-fork sensor, the customers can enjoy the advantages even in highly precise laboratory weighing operation. VIBRA HT series makes a difference in analytical weighing.



## Best usability, comfortable weighing operation

Two line display is adopted in new HT series. Assistant text in information display can help the user to operate the advanced functions. Customizable free keys enable comfortable and efficient operations furthermore.



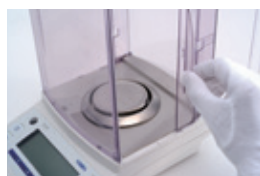
## Print date and time in ISO/GLP/GMP compliant format

Able to print calibration records in ISO/GLP/GMP compliant format with date and time stamp when Shinko printer is connected. In addition, fixed time elapsed printing is available with using interval function.



## Strongly Resistant to harsh environment

Analytical balance must be sometimes installed in the harsh environment where there are a lot of equipment generating disturbing vibrations. New HT which is equipped with newly developed filtering technology is highly resistant to disturbances in the environment.



## Security control

The administrator requires the users to input password to log in the balance. It prevents the unauthorized operators to do unnecessary operations. And the weighing results are output with user-ID information.



## Short stabilization time for more efficient weighing operation

Thanks to newly developed filtering technology, the stabilization time has been reduced. It leads to more efficient weighing operation.



## Simple structure, easy to clean

Structure of windshield and weighing chamber are very simple. It is easy for user to de-assemble and re-assemble, and easy to clean.



## Full Automatic Span Adjustment Function

Span Adjustment function, which automatically detect a shift in the environment like ambient temperature change or longer time usage and calibrate (span adjustment) scale, is equipped. Periodic calibration maintains high-accuracy of the scale.

## Optional density measurement kit

The specific gravity (density) of the objects can be easily measured in specific gravity mode. The density kit is available as option.



### Analytical Balance

Counting Mode
Percent Mode
Carat Mode
Monme Mode
Coefficient Mode
Specific Gravity Mode
Animal weighing mode
Statistic Calculation Mode

Stand-by Function
Switching function for min. readability
Display function for actual readability
Switching of Scale range
Double Range
Direction key
Comparator Function
Add/Accumulate Function
Bar Graph Display
Built-in Calibration Weight

RS-232C Output
Printer Output
ISO/GLP/GMP corresponding print
Clock/Calendar Function
Buzzer Alarm
RTS Free Download

Capacity : 220g-15kg / Readability(d) : 0.001g-0.1g

Back-light LCD display

Under weighing

Windshield ※

# ALE series Precision Balance

Tuning-fork sensor

Saturate really required things and user-friendliness into tiny body enclosure.

## Features

- Speeding up, to approximately 1/2 of stability time, becomes a reality with using newly developed Tuning Fork sensor \*
- Compact design, pursued user-friendliness and minimum size in its class(\*)
- Approximately 30 kinds of function, as well as 8 kinds weighing modes, are mounted inside scale

(\*) Compared with Shinko's equivalent model.



ALE223



ALE3202

## Common Specification

- Tare
  - Span adjustment
  - Over error
  - Temperature and humidity range
  - Power source
  - Output
- Zero to Full weighing range  
 ALE..... Manual operation Span Adjustment with external calibration weight  
 ALE-R..... Semi-automatic Span Adjustment with built-in calibration weight  
 "o-Err" showed when Full weight range + 9 more digits over  
 10-30°C、Up to 85% rh(without the dew condensation)  
 AC adapter: Input 100-240VAC,50-60Hz / Output 5.95VDC  
 Dry-cell battery: AA batteries 4 pcs  
 RS232C + USB (TypeB)

Model name	ALE223R	ALE323R	ALE623R	ALE1502R	ALE2202R	ALE3202R	ALE6202R	ALE6201R	ALE8201R	ALE15001R
Capacity	220g	320g	620g	1500g	2200g	3200g	6200g	6200g	8200g	15000g
Readability (d)	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g
Verification intervals (e)	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g	0.1g	1g	1g	1g
Accuracy class	II	II	II	II	II	II	II	II	II	II
Repeatability	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g
Stabilization time	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.
Pan size	118mm dia			180 × 160mm						
Dimensions(WDH)	205 × 270 × 301mm (Including Windshield)			192 × 265 × 86mm						
Windshield	○	○	○	×	×	×	×	×	×	×

Model name	ALE223	ALE323	ALE623	ALE1502	ALE2202	ALE3202	ALE6202	ALE8201	ALE15001	
Capacity	220g	320g	620g	1500g	2200g	3200g	6200g	8200g	15000g	
Readability (d)	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g	
Verification intervals (e)	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g	0.1g	1g	1g	
Accuracy Class	II	II	II	II	II	II	II	II	II	
Repeatability	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g	
Stabilization time	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	1.6 sec.	
Pan size	118mm dia			180 × 160mm						
Dimensions(WDH)	205 × 270 × 301mm (Including Windshield)			192 × 265 × 86mm						
Windshield	○	○	○	×	×	×	×	×	×	

## Options

Models	Option name
ALE-LM	Relay contact
ALE-RS	Extension RS232C
ALE-DU	Under weighing hook
ALE-DK	Density measurement kit

## Peripheral equipment

Models	Option name
CSP-160 II*	Statistics Printer
CBM-910 II	Standard Printer
LAS-05D-SD	"No wind" Ionizer

\* Not available to use in EEA, Switzerland & Turkey.



## Tuning Fork sensor is mounted

Stability time is greatly reduced.

Signal process of Tuning Fork sensor realize the speed up. Stability time becomes 1/2 compared with current models.

## Windshield outclassingly convenient

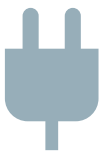
Newly designed Windshield is standard option for ALE223(R) through 623(R). Attaching/detaching are in one touch! Superior for cleaning.



## Able to drive by dual power source

"AC adapter 100-240V", "Dry Battery (AA: 4pcs)", Main power will not be shut down when dry batteries are placed.!

AC adapter  
100 · 240VAC

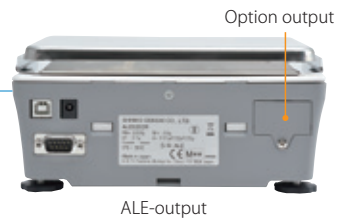


Dry Battery



## Correspond with various system by extensive output options

RS-232C output and USB output are standard equipped. Other than that, Ethernet output, Relay contact and Extension RS232C (optional\*) are able to correspond to various system.



## Battery drive

ALE can be operated with dry-cell batteries low power consumption in tuning-fork sensor unit. Battery is useful also as reserve electric power.



ALE-battery



Capacity : 220g-12kg / Readability(d) : 0.001g-0.1g

Back-light LCD display

Under weighing

Windshield ※

# AJ series Precision Balance

Tuning-fork sensor

## High-Accuracy / Multiple Functions Tuning Fork sensor equipped standard model

### Features

- High performance model, scale's basic performance is upgraded
- Tuning Fork sensor equipped basic model
- Widely correspond to various use application
- Eye-friendly large LCD display with back-light
- RS-232C is standard option



### Common Specification

- Tare Zero to Full weighing range
- Span adjustment AJ.....Manual operation Span Adjustment with external calibration weight  
AJH.....Semi-automatic Span Adjustment with built-in calibration weight
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 5-35°C (E type), 10-30°C (CEN type) Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output 12VDC
- Output RS232C(Din5p)

Model name	AJH-220E AJH-220CEN	AJH-320E AJH-320CEN	AJH-420E AJH-420CEN	AJH-620E AJH-620CEN	AJH-2200E AJH-2200CEN	AJH-3200E AJH-3200CEN	AJH-4200E AJH-4200CEN	AJ-220E AJ-220CEN	AJ-320E AJ-320CEN	AJ-420E AJ-420CEN	AJ-620E AJ-620CEN
Capacity	220g	320g	420g	620g	2200g	3200g	4200g	220g	320g	420g	620g
Readability (d)	0.001g	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.001g	0.001g	0.001g	0.001g
Verification intervals (e)	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g	0.01g	0.01g	0.01g	0.01g
Accuracy class	II	II	II	I	II	II	II	II	II	II	I
Repeatability	0.001g	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.001g	0.001g	0.001g	0.001g
Linearity	±0.001g	±0.001g	±0.001g	±0.001g	±0.01g	±0.01g	±0.01g	±0.001g	±0.001g	±0.001g	±0.002g
Stabilization time	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	2.5 sec.	2.5 sec.	2.0 sec.	2.0 sec.
Pan size	118mm dia				180 × 160mm			118mm dia			
Dimensions(WDH)	182 × 235 × 168mm (Including Windshield)				192 × 265 × 87mm			182 × 235 × 168mm (Including Windshield)			
Windshield	○	○	○	○	×	×	×	○	○	○	○

Model name	AJ-820E AJ-820CEN	AJ-1200E AJ-1200CEN	AJ-2200E AJ-2200CEN	AJ-3200E AJ-3200CEN	AJ-4200E AJ-4200CEN	AJ-6200E AJ-6200CEN	AJ-8200E AJ-8200CEN	AJ-12KE AJ-12KCEN
Capacity	820g	1200g	2200g	3200g	4200g	6200g	8200g	12000g
Readability (d)	0.01g	0.01g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g
Verification intervals (e)	0.01g	0.1g	0.1g	0.1g	0.1g	0.1g	1g	1g
Accuracy class	I	II	II	II	II	I	II	II
Repeatability	0.01g	0.01g	0.01g	0.01g	0.01g	0.01g	0.1g	0.1g
Linearity	±0.01g	±0.01g	±0.01g	±0.01g	±0.01g	±0.02g	±0.1g	±0.1g
Stabilization time	2.0 sec.	2.0 sec.	2.5 sec.	2.5 sec.	2.5 sec.	3.0 sec.	2.5 sec.	2.5 sec.
Pan size	170 × 142mm		180 × 160mm					
Dimensions(WDH)	182 × 235 × 75mm		192 × 265 × 87mm					
Windshield	×	×	×	×	×	×	×	×

### Options

Models	Option name
AJBT(S)	Rechargeable battery (200g-1200g)
AJBT(M)	Rechargeable battery (2200g-12kg)
AJUH(S)	Under weighing hook (220g-1200g)
AJUH(M)	Under weighing hook (2200g-12kg)
AJDK	Density measurement kit

### Peripheral equipment

Models	Option name
CSP-160 II *	Statistics Printer
CBM-910 II	Standard Printer
LAS-05D-SD	"No wind" Ionizer
SDI	Satellite Second Display

\* Not available to use in EEA, Switzerland & Turkey.

Capacity : 820g-15kg / Readability(d) : 0.01g-1g

Back-light LCD display

IP65

Dry-cell battery

# CJ series Precision Balance

Tuning-fork sensor

**World first! IP65 compliance with min. graduation at 10mg.**  
**Electronic Balance used for heavy duty purpose in stainless steel body.**

## Features

- Stainless Steel enclosure (SUS304), rust-resistance and strong for corrosion
- Low power consumption and earth-friendly eco-product
- Ubiquitous weighing scale with dry battery (four AA battery) drive (optional)
- Large LCD display with auto-off back light  
Able to use as Counting Scale
- Employed 2 way drive method: AC Adaptor, Dry Battery
- Ubiquitous weighing, anywhere and anytime (Dry Battery type is optional)
- Corresponding to free download Data Acquisition Software "RTS"



## Common Specification

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- Ingress Protection Rating IP65
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 0~40°C, Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output 5.95VDC
- Output RS232C(Dsub 9P)

Model name	CJ-820E CJ-820CE	CJ-3200E CJ-3200CE	CJ-8200E CJ-8200CE	CJ-15KE CJ-15KCE
Capacity	820g	3200g	8200g	15000g
Readability (d)	0.01g	0.1g	0.1g	1g
Repeatability	0.01g	0.1g	0.1g	1g
Linearity	± 0.01g	± 0.1g	± 0.1g	± 1g
Pan size	140mm dia	190 × 190mm		
Dimensions(WDH)	206 × 312 × 89mm			

## Options

Models	Option name
CJ-R4	RS422A output
CJ-BZ	Buzzer output
CJ-LM	Relay contact
CJ-LS	Full pack (BZ, RS, LM)
CJ-BT	Dry-cell battery pack
CJ-WR	Water-proof cable for RS232C output
AJUH(S)	Under-weighing hook
CJ-AP(S)	Bucket for animal weighing (820g)
CJ-AP(M)	Bucket for animal weighing (3200g)
CJ-AP(L)	Bucket for animal weighing (8200g-15kg)

## Peripheral equipment

Models	Option name
CSP-160 II*	Statistics Printer
CBM-910 II	Standard Printer

\* Not available to use in EEA, Switzerland & Turkey.

## Precision Balance

- Counting Mode
- Percent Mode
- Carat Mode
- Monme Mode
- Coefficient Mode
- Specific Gravity Mode
- Animal weighing mode
- Statistic Calculation Mode

- Stand-by Function
- Switching function for min. readability
- Display function for actual readability
- Switching of Scale range
- Double Range

- Direction key
- Comparator Function
- Add/Accumulate Function
- Bar Graph Display
- Built-in Calibration Weight

- RS-232C Output
- Printer Output
- SO/GLP/GMP corresponding printer
- Clock/Calendar Function
- Buzzer Alarm
- RTS Free Download

Capacity : 320g - 12kg / Readability(d) : 0.001g - 0.1g

Back-light LCD display

Windshield

# AB series Precision Balance

Tuning-fork sensor

High-spec with Tuning Fork sensor equipped.  
Middle class equipment with 1mg Readability.

### Features

- Line-ups featured usability and general versatility
- Adopt large size weigh platter in its class
- Large and eye-friendly LCD display with back light
- RS-232C is standard option
- Corresponding product to free download Data Acquisition Software "RTS"



### Common Specification

- Tare
  - Span adjustment
  - Over error
  - Temperature and humidity range
  - Power source
  - Output
- Zero to Full weighing range  
 AB·····Manual operation Span Adjustment with external calibration weight  
 AB-R·····Semi-automatic Span Adjustment with built-in calibration weight  
 "o-Err" showed when Full weight range + 9 more digits over  
 5 - 35°C, Up to 80% rh(without the dew condensation)  
 AC adapter Input 100-240VAC / Output DC6V  
 RS232C(D-Sub9Pin)

Model name	AB323	AB623	AB1202	AB3202	AB12001
Capacity	320g	620g	1200g	3200g	12000g
Readability (d)	0.001g	0.001g	0.01g	0.01g	0.1g
Verification intervals (e)	0.01g	0.01g	0.1g	0.1g	1g
Accuracy class	II	II	II	II	II
Repeatability	0.001g	0.001g	0.01g	0.01g	0.1g
Linearity	± 0.003g	± 0.004g	± 0.02g	± 0.03g	± 0.2g
Stabilization time	3.0 sec.	3.5 sec.	3.0 sec.	3.5 sec.	3.0 sec.
Pan size	140mm dia		190 × 190mm		
Dimensions(WDH)	293 × 202 × 206mm (Including Windshield)			293 × 196 × 89mm	
Windshield	○	○	×	×	×

Model name	AB323R	AB623R	AB1202R	AB3202R	AB12001R
Capacity	320g	620g	1200g	3200g	12000g
Readability (d)	0.001g	0.001g	0.01g	0.01g	0.1g
Verification intervals (e)	0.01g	0.01g	0.1g	0.1g	1g
Accuracy class	II	II	II	II	II
Repeatability	0.001g	0.001g	0.01g	0.01g	0.1g
Linearity	± 0.003g	± 0.004g	± 0.02g	± 0.03g	± 0.2g
Stabilization time	3.0 sec.	3.5 sec.	3.0 sec.	3.5 sec.	3.0 sec.
Pan size	140mm dia		190 × 190mm		
Dimensions(WDH)	293 × 202 × 206mm (Including Windshield)			293 × 196 × 89mm	
Windshield	○	○	×	×	×

### Options

Models	Option name
ABBT	Dry cell battery

### Peripheral equipment

Models	Option name
CSP-160 II *	Statistics Printer
CBM-910 II	Standard Printer
LAS-05D-SD	"No wind" Ionizer

\* Not available to use in EEA, Switzerland & Turkey.

Capacity : 220g-12kg / Readability(d) : 0.01g-1g

Back-light LCD display

# SJ series Precision Balance

Tuning-fork sensor

Compact Electronics Balance with by far the best operability.  
General purpose equipment in high-resolution yet reasonable.



## Features

- High Cost Performance equipment in high-resolution and durable
- Correspond widely to various usage purpose. Base equipment mounted Tuning Fork sensor

## Common Specification

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 5-35°C (E type) & 10-30°C (CE type), Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output 12VDC
- Output RS232C (Optional)

Model name	SJ-220E SJ-220CEN	SJ-420E SJ-420CEN	SJ-620E SJ-620CEN	SJ-1200E SJ-1200CEN	SJ-2200E SJ-2200CEN	SJ-4200E SJ-4200CEN	SJ-6200E SJ-6200CEN	SJ-12KE SJ-12KCEN
Capacity	220g	420g	620g	1200g	2200g	4200g	6200g	12000g
Readability (d)	0.01g	0.01g	0.01g	0.1g	0.1g	0.1g	0.1g	1g
Verification intervals (e)	0.01g	0.01g	0.1g	0.1g	0.1g	0.1g	1g	1g
Accuracy class	II	II	II	II	II	II	II	II
Repeatability	0.01g	0.01g	0.1g	0.1g	0.1g	0.1g	1g	1g
Linearity	± 0.01g	± 0.01g	± 0.01g	± 0.1g	± 0.1g	± 0.1g	± 0.1g	± 1g
Stabilization time	2.5 sec.	2.0 sec.	2.0 sec.	2.0 sec.	2.5 sec.	2.5 sec.	3.0 sec.	2.5 sec.
Pan size	140mm dia			170x140mm	180 × 160mm			
Dimensions(WDH)	182 × 235 × 75mm				192 × 265 × 87mm			

## Options

Models	Option name
SJBT(S)-N	Rechargeable battery (200g-1200g)
AJBT(M)-N	Rechargeable battery (2200g-12kg)
SJR(S)-N	RS232C output (220g-1200g)
SJR(M)-N	RS232C output (2200g-12kg)
SJLM(S)	Relay contact (220g-1200g)
SJLM(M)	Relay contact (2200g-12kg)
AJUH(S)	Under weighing hook (220g-1200g)
AJUH(M)	Under weighing hook (2200g-12kg)

\* Some options are not available together at the same time.

## Peripheral equipment\* 2

Models	Option name
CSP-160II* 1	Statistics Printer
CBM-910II	Standard Printer
SDI	Satellite Second Display

\* 1 Not available to use in EEA, Switzerland & Turkey.

\* 2 Need to install option SJR(S) or SJR(M) to connect

# MD series Moisture Determination Balance

## Adaptability

ViBRA MD series can be available for moisture analysis of various objects and various locations. Unique organic carbon heater has strong power and is environmentally correct heat source.

## Simplicity

ViBRA MD series has automatic measurement mode in which MD monitors the drying process and automatically stops the operation. And the structure is quite simple that daily cleaning and maintenance are easy.

## Reliability

No other factor is more important than reliability in measurement performance. Combination of auto-taring system and newly developed organic carbon heater realize excellent repeatability in measurement results.



## Features

- Simple structure - easy to clean
- Newly adopted, organic-carbon heater
- Fast drying, high repeatability
- Connection to outside devices
- Alert signal
- Clear, bright and large LCD display

Grain, Processed Food, Medicine, Wood, Paper, Concrete, Jute, Copra, coke, Nonwoven fabric, Plastic pellets, ...etc. In many products, moisture content is one of the key factors in quality control process. ViBRA MD series provides simple but reliable measurement of moisture content in laboratory and manufacturing process.

## Common specifications

- Measurement format Evaporation weight loss method
- Measurement mode Automatic operation mode, Timed operation mode
- Display LCD with backlit (96 × 40 mm)
- Storage of measurement conditions 5
- Heat source Organic carbon heater (280W × 2)
- Power supply AC100 ~ 120V/220 ~ 240V
- Power consumption Max. 900W
- Sample pan Stainless steel (110mm dia., 11mm depth)
- Output RS232C
- Items included Sample pan × 2, sample pan handler, windshield, sample pan tray, spoon, spare fuse, sample aluminum sheet × 10, power cord, 3P-2P plug, operation manual

Model name	MD83
Maximum sample weight	80g
Minimum sample weight	1g
Readability of balance	0.005g
Readability moisture content	0.01% / 0.1% *1
Repeatability with 5g sample	0.1% *2
Measurement range	0 ~ 100% (wet base, solids), 0 ~ 500% (dry base)
Temperature range	30 - 180 °C
Increment in temperature	1°C

\*1 0.01% unit is displayable only.

\*2 standard deviation

## Options

Models	Option name
DA-1	Disposable aluminium sheet (500pcs)
FW-100	Deodorizing windshield

## Peripheral equipment

Models	Option name
VZ-380	Printer
TQ-100	Sample crusher
FDL-02	Data logger software

## Platform Scale

Capacity:17kg - 62kg . Readability:0.1g - 1g

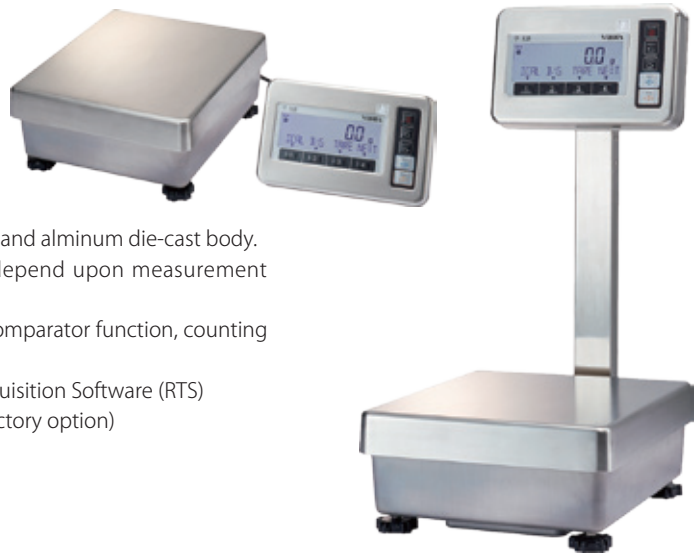
Fluorescent display

IP65

# HJK series Platform Scale

Tuning fork sensor

**High-precision Platform Scale compliant to IP65 standards (Resolution: 1/330,000) Stainless Steel body, able to wash down.**



## Features

- Durable design with stainless steel enclosure surface and aluminum die-cast body.
- Able to assemble to pole type or separate type depend upon measurement purpose or location
- Correspond to various measurement occasion like comparator function, counting mode or % mode
- Correspondence product to free download Data Acquisition Software (RTS)
- Scale cable length: 1m (extended to 5m or 10m as factory option)
- OIML & EU approval class II

## Common Specification

- Tare Zero to Full weighing range
- Span adjustment HJK.....Manual operation Span Adjustment with external calibration weight  
HJKR.....Semi automatic Span Adjustment with internal calibration weight
- Ingress Protection Rating IP65
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 5-35°C, Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / DC12V
- Output RS232C (Dsub 9P)

## Tough body with superior dust-proof and water-proof structure. (IP65 standards compliant)

Weighing and Display unit is made by stainless steel which is superior for durability and anti-corrosion.



It is still comfortable in dusty or high-humidity place, because it is IP65 standard compliant product in concealed structure so that it is washable.

In addition, aluminum diecast, which is robust, strong for radio wave interference and chemical resistance, is used. Tough design in focus of actual workplace usage.

## Smooth angle adjustment

For standard type, Panel angle can be adjusted in non-step. Panel's best position, suitable for location and purpose of usage, can be selected.

## Type change suitable for usage

Set up scale in pole type or separate type depend upon how to use and usage location. It turns into a compact integrated type with using integration bracket for display (standard).



In case when integration bracket for display (optional) is attached.

## Platform Scale

Counting Mode

Percent Mode

Carat Mode

Monme Mode

Coefficient Mode

Specific Gravity Mode

Animal weighing mode

Statistic Calculation Mode

Stand-by Function

Switching function for min. readability

Display function for actual readability

Switching of Scale range

Double Range

Direction key

Comparator Function

Add/Accumulate Function

Bar Graph Display

Built-in Calibration Weight

RS-232C Output

Printer Output

SO/GLP/GMP corresponding print

Clock/Calendar Function

Buzzer Alarm

RTS Free Download



## External weight types

Model name	HJ17K0.1S	HJ22K0.1S	HJ33K0.1S	HJ62K0.1DS	
Capacity	17kg	22kg	33kg	6200g	62kg
Readability (d)	0.1g	0.1g	0.1g	0.1g	1g
Verification intervals (e)	1g	1g	1g	1g	
Non-linearity	± 0.3g	± 0.3g	± 0.3g	± 0.3g	± 3g
Repeatability (σ)	0.1g	0.1g	0.1g	0.1g	1g
Pan size	400 × 350mm				
Dimension (LDH)	350 x 482 x 175mm (350 x 482 x 700mm when pole option installed)				
Calibration	With external weight				

## Internal weight types

Model name	HJ17K0.1SR	HJ22K0.1SR	HJ33K0.1SR	HJ62K0.1DSR	
Capacity	17kg	22kg	33kg	6200g	62kg
Readability (d)	0.1g	0.1g	0.1g	0.1g	1g
Verification intervals (e)	1g	1g	1g	1g	
Non-linearity	± 0.3g	± 0.3g	± 0.3g	± 0.3g	± 3g
Repeatability (σ)	0.1g	0.1g	0.1g	0.1g	1g
Pan size	400 × 350mm				
Dimension (LDH)	350 x 482 x 175mm (350 x 482 x 700mm when pole option installed)				
Calibration	With internal and external weight				

## Options

Models	Option name
HJK-DU	Hook for hanging weighing
HJK-LM	Relay output *1,
HJK-R4	RS422 output *1 *2,
HJK-BT	Internal rechargeable battery *1,
HJK-PK	Pole kit for Separate type
HJK-PU	Extended scale cable 5 m / 10 m (factory option),

\* 1 Relay output, RS422 output and Internal rechargeable battery cannot be installed together.

\* 2 When RS422 output is installed, the standard RS232C output is not available.

## Peripheral equipment

Models	Option name
CBM-910 II	Standard Printer

Counting Mode
Percent Mode
Carat Mode
Monme Mode
Coefficient Mode
Specific Gravity Mode
Animal weighing mode
Statistic Calculation Mode

Stand-by Function
Switching function for min. readability
Display function for actual readability
Switching of Scale range
Double Range
Direction key
Comparator Function
Add/Accumulate Function
Bar Graph Display
Built-in Calibration Weight

RS-232C Output
Printer Output
SO/GLP/GMP corresponding print
Clock/Calendar Function
Buzzer Alarm
RTS Free Download

Capacity : 620g - 300kg / Readability : 0.001g - 1g

Back-light LCD display

IP65

# FS series

## Precision Platform Scale

Tuning-fork sensor

Large capacity, max. 300kg  
High resolution up to 620,000 divisions IP65

### Features

- High Capacity and High Precision – Two in One  
Reliable measurement for every process in manufacturing



### Common Specification

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- Ingress Protection Rating IP65
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 5 - 40°C, Up to 85% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC / Output DC6V and dry-cell battery \*1
- Output RS232C(Dsub 9Pin)+Printer out put(Din 8Pin)
- Scale cable length 5m for FS 150K1GF and 300K1GF.1m for all other models \*2

Model name	FS 623	FS 3202	FS 6202	FS 15001	FS 30K0.1G
Capacity	620g	3200g	6200g	15000g	30kg
Readability (d)	0.001g	0.01g	0.01g	0.1g	0.1g
Verification intervals (e)	0.01g	0.1g	0.1g	1g	1g
Accuracy class	II	II	II	II	II
Repeatability	0.001g	0.01g	0.01g	0.1g	0.1g
Linearity	± 0.002g	± 0.02g	± 0.02g	± 0.2g	± 0.1g
Stabilization time	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.
Pan size	140mm dia.	190 × 190 mm	190 × 190 mm	190 × 190 mm	310 × 330 mm
Dimensions(WDH)	294 x 352 x 570mm				310x444x672mm

Model name	FS 60K0.1G	FS 100K1G	FS 200K1G	FS 150K1GF	FS 300K1GF
Capacity	60kg	100kg	200kg	150kg	300kg
Readability (d)	0.1g	1g	1g	1g	1g
Verification intervals (e)	1g	10g	10g	10g	10g
Accuracy class	II	II	II	II	II
Repeatability	0.1g	1g	1g	0.7g	0.8g
Linearity	± 0.2g	± 2g	± 2g	± 3g	± 5g
Stabilization time	2.5 sec.	2.5 sec.	2.0 sec.	2.0 sec.	2.0 sec.
Pan size	380 × 530 mm	380 × 530 mm	380 × 530 mm	800 × 600 mm	800 × 600 mm
Dimensions(WDH)	380x653x804m			800x600x142mm	

### Options

Models	Option name
FS-RS	additional RS232C output
FS-R4	RS422A output
FS-LM	Relay contact
FS-DS	Display stand
FS-PK	Pole stand
FS-SC	Extended scale cable (5m, 10m)
FS-WS	Windshield for FS 623 (S, M, L. Three sizes selectable)
FS-OX(S)	Communication option box (S)
FS-OX(M)	Communication option box (M)

### Peripheral equipment

Models	Option name
CBM-910II	Standard Printer

\*1 D type(U. S. A.), R20 & LR20(IEC category)are available.

\*2 "Scale cable" is cable between indicator and platform.

Platform Scale

Counting Mode

Coefficient Mode

Specific Gravity Mode

Animal weighing mode

Statistic Calculation Mode

Stand-by Function

Switching function for min. readability

Display function for actual readability

Switching of Scale range

Double Range

Direction key

Comparator Function

Add/Accumulate Function

Bar Graph Display

Built-in Calibration Weight

RS-232C Output

Printer Output

SO/GLP/GMP corresponding print

Clock/Calendar Function

Buzzer Alarm

RTS Free Download

## High Capacity and High Precision – Two in One

FS series attains high capacity and high precision in single unit. With FS 300K1GF model, you can measure up to 300kg with 1g Readability, which satisfies two demands in single unit, high capacity and high resolution. Unique technology "tuning-fork" sensor enables "two-in-one" feature. This unique technology also ensures excellent weighing performance and long-term stability even in tough condition.



FS150K1GF & FS300K16F



FS3202  
FS6202 & F15001

## Reliable measurement for every process in manufacturing

FS series helps your daily weighing operation in every process in manufacturing line. With weighing range from 620g to 300kg and minimum read-out 1mg, FS can cover every process, in-bound material control, production, inspection and out-bound control, etc...

## Selectable indicator

You can choose one of two indicators, i02 type and i03 type. i03 type has two sub-displays in which two additional information can be indicated (tare weight, gross weight, lower and upper limit, etc..) It make weighing operation easier and more comfortable. (NOTE : Not change after delivery)



i02



i03

## in manufacturing

Ingress Protection rating (IP65) which allows FS to be used in tough environment. After daily operation you can wash FS with water and keep balance in clean condition.



## Options – for more efficient and useful operation



wind shield for FS623



Floor Stand



Pole Stand

Capacity : 620g - 300kg / Readability(d) : 0.001g - 1g

LCD display

IP65

# FZ series

## Explosion-proof scale

Tuning-fork sensor

Correspond to the needs at explosion-proof workplace with 2 kinds of display and variety line-ups.



### Features

- Dust-proof/Water-proof structure compliant with IP65 standards
- Panel angle can be adjusted in non-step (excluding FZ-150KF, 300KF)

### Common Specification

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- ATEX approval II 1 G Ex ia II B T4 Ga
- Ingress Protection Rating IP65
- Over error "o-Err" showed when Full weight range + 9 more digits over
- Temperature and humidity range 5-40°C (Scale & display), 0-40°C (Power supply box), Up to 85% rh (without the dew condensation)
- Power source Power supply box attached as standard
- Output RS232C or option connector
- Indicator i02 or i03 selectable \*2  
model name with i02: FZ 623Ex-i02  
model name with i03: FZ 623Ex-i03
- Scale cable length 5m for FZ 150K1GFEx and 300K1GFEx  
1m for all other models \*3
- Power supply cable 5m \*4

FZ 30K0.1GEx



FZ 60K0.1GEx  
FZ 100K1GEx  
FZ 200K1GEx

Model name	FZ 623Ex	FZ 3202Ex	FZ 6202Ex	FZ 15001Ex	FZ 30K0.1GEx
Capacity	620g	3200g	6200g	15000g	30kg
Readability (d)	0.001g	0.01g	0.01g	0.1g	0.1g
Verification intervals (e)	0.01g	0.1g	0.1g	1g	1g
Accuracy class	II	II	II	II	II
Repeatability	0.001g	0.01g	0.01g	0.1g	0.1g
Linearity	± 0.002g	± 0.02g	± 0.02g	± 0.2g	± 0.1g
Stabilization time	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.	3.0 sec.
Pan size	140mm dia.	190 × 190 mm	190 × 190 mm	190 × 190 mm	310 × 330 mm
Dimensions(WDH)	294 × 352 × 570mm				310x444x672mm

Model name	FZ 60K0.1GEx	FZ 100K1GEx	FZ 200K1GEx	FZ 150K1GFEx	FZ 300K1GFEx
Capacity	60kg	100kg	200kg	150kg	300kg
Readability (d)	0.1g	1g	1g	1g	1g
Verification intervals (e)	1g	10g	10g	10g	10g
Accuracy class	II	II	II	II	II
Repeatability	0.1g	1g	1g	0.7g	0.8g
Linearity	± 0.2g	± 2g	± 2g	± 3g	± 5g
Stabilization time	2.5 sec.	2.5 sec.	2.0 sec.	2.0 sec.	2.0 sec.
Pan size	380 × 530 mm	380 × 530 mm	380 × 530 mm	800 × 600 mm	800 × 600 mm
Dimensions(WDH)	380x653x804mm			800x600x142mm	

### Options

Models	Option name
FZ-RS	additional RS232C output
FZ-R4	RS422A output
FZ-LM	Relay contact
FZ-DS	Display stand
FZ-PK	Pole stand
FZ-PC	Replacement power cable (10m~70m, per/10m) *5
FS-SC	Extended scale cable (5m, 10m)
FZ-WS	Windshield for FZ623Ex (S, M, L. Three sizes selectable)
FZ-OX(M)	Communication option box (M)

\* Some options are not available together at the same time. Please contact distributor

### Peripheral equipment

Models	Option name
CBM-910II	Standard Printer

\*2 Not changeable after delivery

\*3 "scale cable" is cable between platform and indicator.

\*4 "power supply cable" is cable between indicator and power supply box.

\*5 Please contact local distributor in case you need more than 70m length

Ex-proof scale

- Counting Mode
- Percent Mode
- Carat Mode
- Monme Mode
- Coefficient Mode
- Specific Gravity Mode
- Animal weighing mode
- Statistic Calculation Mode

- Stand-by Function
- Switching function for min. readability
- Display function for actual readability
- Switching of Scale range
- Double Range
- Direction key
- Comparator Function
- Add/Accumulate Function
- Bar Graph Display
- Built-in Calibration Weight

- RS-232C Output
- Printer Output
- SO/GLP/GMP corresponding print
- Clock/Calendar Function
- Buzzer Alarm
- RTS Free Download

## High Capacity and High Precision – Two in One

FZ series attains high capacity and high precision in single unit. With FZ 300K1GF model, you can measure up to 300KG with 1g Readability, which satisfies two demands in single unit, high capacity and high resolution. Unique technology "tuning-fork" sensor enables "two-in-one" feature. This unique technology also ensures excellent weighing performance and long-term stability even in tough condition.



FZ 150K1GFEx  
FZ 300K1GFEx  
Scale cable length: 5m

FZ 623Ex  
\* Wind Shield is an option.

FZ 3202Ex  
FZ 6202Ex  
FZ 15001Ex

## 2 kinds of display selectable for usage

Display i02: Convenient Key layout, and Display i02 for direct key, Display i03 with supplemental display is attached to indicate weighing status, selectable from 2 kinds of display .

### Display Unit i03

Indicate weighing value

Tare / Upper Limit

Gross Weight / Lower Limit  
Date / Time



### Display Unit i02

Indicate weighing value



Power Supply Box

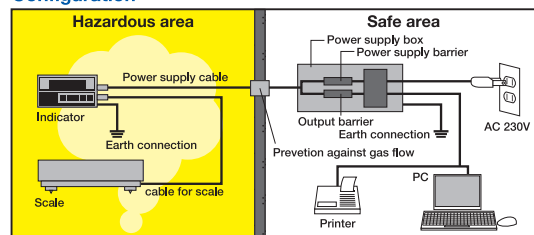
## Shinko Denshi's explosion-proof scale is compliant for international standards' engineering criteria



### II 1 G Ex ia IIB T4 Ga

Weighing operation must be often carried out in hazardous area in industry like pharmaceutical, aloma-chemicals, etc...We offer Ex models as FZ series with category 1G (zone 0, 1 and 2). All advantages such as "two-in-one" , IP protection, excellent weighing performance are available in FZ series.

### Configuration



### Operation area

	II A	II B	II C
T1	aceton, benzene, ammonia, methanol, ethane, toluene, propane, methane, acetic acid	coke-oven gas, acrylonitrile, hydrocyanic acid, cyclopropane	hydrogen
T2	ethanol, butanol, butane, methyl methacrylate	ethylene, ethylene oxide, ethyl acrylate	acetylene
T3	gasoline, hexane, pentane	acrylaldehyde, dimethyl ether	
T4	acetaldehyde, trimethylamine	ethyl methyl ether, diethyl ether	
T5			carbon disulfide
T6	ethyl nitrite		ethyl nitrite

Capacity: 60g -150kg/ Readability (d): 0.001g-20g / minmum unit weight for countable: 0.1mg-1.5g

Back-light LCD display

# CUX series Counting Scale

Tuning-Fork

Strain Gauge

## This scale realizes a counting error of "ZERO"

in counting work on parts both smal and large

### Features

- Equipped with a back-light LCD display that makes it easy to see quantity, unit weight, and total weight
- Equipped with and ACR (Automatic Counting Revision) function that revises variation to count accurately.for accurate counting operation
- comes equipped standard with RS232C output that can connect to computers and printers
- Equipped with a taring tare skip prevention function to stop mistakes in the work process (Tare-reminder function)
- Comes with maximum and minimum value setting and a distinction buzzer function
- Three back-lit LCD display to indicate "quantity", "unit weight" and total weight at the same time



### Common Specification

- Tare Zero to full weighing range
- Maximum counting quantity 600,000pcs for CUX60~12K, 16KS, 30KS  
100,000pcs for CUX16K, 30K, 60K, 150K
- Span adjustment Manual operation span adjustment with external weight
- Over error "o-Err" appears when load of full weight range + 9 digits over
- Temperature and humidity range 0-40°C、Up to 80% rh(without the dew condensation)
- Power source AC adapter Input 100-240VAC,50-60HZ / Output 6VDC,1A
- Output RS232C (D-sub 9P)

Model name	CUX60	CUX150	CUX300	CUX600	CUX1500	CUX3000	CUX6000	CUX12K
Measurement system	Tuning-fork sensor							
Capacity	60g	150g	300g	600g	1500g	3000g	6000g	12kg
Countable unit weight	0.1mg	0.25mg	0.5mg	1mg	2.5mg	5mg	10mg	20mg
Minimum readability	0.001g	0.002g	0.005g	0.01g	0.05g	0.05g	0.1g	1g
Pan size	118mm dia.		140mm dia.		234x204mm			
Dimension (WxDxH)	260x344x173mm (including windshield)				260x344x101mm			
Windshield	○	○	○	△	△	△	△	△

\* Windshield : ○=Standard,△=Option, ×=Not included

Model name	CUX16KS	CUX30KS	CUX16K	CUX30K	CUX60K	CUX150K
Measurement system	Tuning-fork sensor			Strain guage loadcell sensor		
Capacity	16kg	30kg	16kg	30kg	60kg	150kg
Countable unit weight	50mg	0.1g	0.16g	0.3g	0.6g	1.5g
Minimum readability	0.5g	1g	0.002kg	0.005kg	0.01kg	0.02kg
Pan size	360x320mm		330x310mm		380x530mm	
Dimension (WxDxH)	360x482x683mm		330x448x491mm		380x669x766mm	
Windshield	×	×	×	×	×	×

\* Windshield : ○=Standard,△=Option, ×=Not included

### Option

Models	Option name
LM	Relay contact
BT	Dry-cell battery pack

### Peripheral equipment

Models	Option name
CSP-160 II*	Statistics Printer
CBM-910 II	Standard Printer

\* Not available to use in EEA, Switzerland &amp; Turkey.



CUX300-600



CUX1500-12K



CUX16KS-30KS

Counting scale

Counting Mode

Percent Mode

Carat Mode

Monme Mode

Coefficient Mode

Specific Gravity Mode

Animal weighing mode

Statistic Calculation Mode

Stand-by Function

Switching function for min. readability

Display function for actual readability

Switching of Scale range

Double Range

Direction key

Comparator Function

Add/Accumlate Function

Bar Graph Display

Built-in Calibration Weight

RS-232C Output

Printer Output

SO/GLP/GMP corresponding print

Clock/Calendar Function

Buzzer Alarm

RTS Free Download

## Counting Scale

### Counting Mode

- Percent Mode
- Carat Mode
- Monme Mode
- Coefficient Mode
- Specific Gravity Mode
- Animal weighing mode
- Statistic Calculation Mode

### Stand-by Function

- Switching function for min. readability
- Display function for actual readability
- Switching of Scale range
- Double Range

### Direction key

- Comparator Function
- Add/Accumulate Function

### Bar Graph Display

- Built-in Calibration Weight

### RS-232C Output

### Printer Output

- SO/GLP/GMP corresponding print
- Clock/Calendar Function

### Buzzer Alarm

### RTS Free Download

## An intelligent counting scale with perfect accuracy and usability

The full lineup of products comes equipped with excellent features and the pioneering spirit of counting scales, made to be easy to use, accurate, and robust.

**Variation Guide**

**Displays distinction results of the limit function**

**Displays total weight**

**Displays weight per unit for sampling.**

**300 item memory function.**  
Registers 300 items to memory.  
Registers up to 30 of these in these in combination with tare weight.

**Counting Limit Function**  
Set maximum and minimum values to distinguish measurement results with "Hi (high)", "OK (proper quantity)" and "Lo (low)".  
Saves unit weight with any number.

**Accumulative adding function**  
Calculates the accumulative total by adding each time after doing sub-division work.  
Total and accumulative total are displayed simultaneously, making them easy to see.

**Counting Setting Function**  
Saves quantities with any number.  
CR function operation ON.

**Unit Weight Setting**  
Saves unit weight with any number.

**AISCS Function**  
Restore function that improves counting accuracy

**Variation Guide**

**ACR function**

## "ACR (Automatic Counting Revision Function)"

If data stabilizes when the variation function (-0.5 pcs. To +0.5 pcs.) is in the safe range, then the CR function can work automatically (ACR function) to do counting work accurately.




It is also possible to turn the ACR function OFF so it can be used to detect contaminants being mixed in.

## NEW Tare Skip Prevention Function CUX Series New Function



Tare Skip Prevention Function in operation

## Tare Skip Prevention Function Mechanism

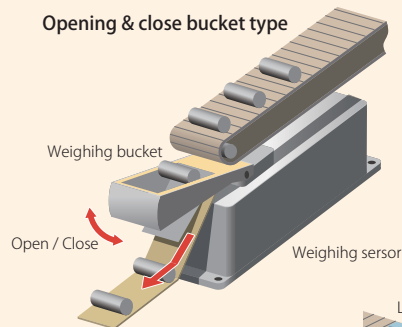
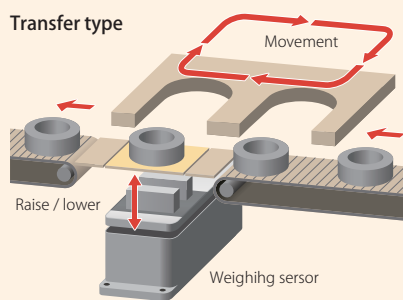
1. Counting 
2. Remove the container 
3. Screen display 
4. Cannot count quantity until you press the taring button.



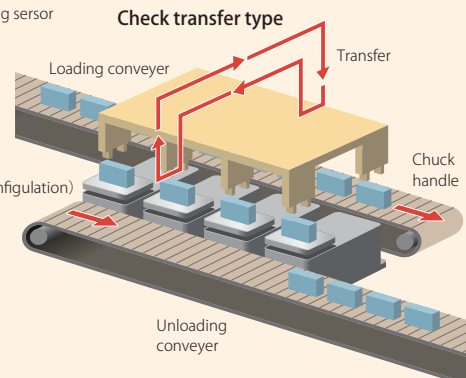
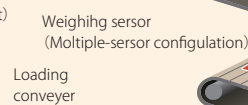
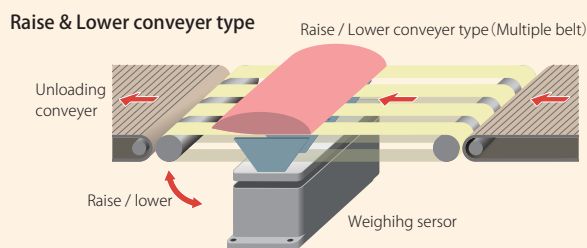


# Built-in weighing unit

Shinko Denshi is a pioneer of Built-in Weighing Unit. Shinko's unit is able to built-in to several production system and/or apparatus.



- High-performance sensor is employed correspond to the usage.
- Panel mount type suitable for built-in.
- Multi-Communication Function convenient for PLC connection.



Capacity: 300g -3200g / Readability (d): 0.001g-0.01g

IP65  
(\*Only for UF-620 and UF-3200)

# UF series Built-in weighing unit

Electro-magnetic sensor

High-Accuracy/Fast response in 25 mm width !

### Features

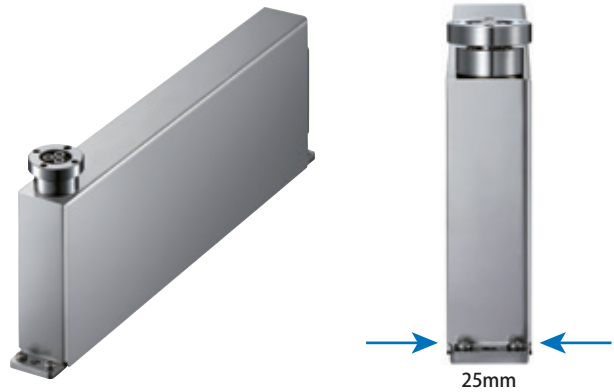
- Realized a high-accuracy weighing with min. resolution (0.001g)
- Display resolution 1mg at 5% capacity.: approx. 0.4 sec, Weighing renewal rate at max.100 times/sec, Fast response

### Common specifications

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- Temperature and humidity range 0 to 40 °C , Up to 80%rh (No condensation)
- Power source DC +24V± 10%, 0.1A
- Interface Half duplex RS485, Full duplex RS232C 1200 to 38.4kbps

Model name	UF-300
Capacity	300g
Readability (d)	0.001g *1
Repeatability	0.001g
Linearity	± 0.002g
Stabilization time	0.4 sec.
Data updating interval (max.)	106 times/sec.
Dimensions(WDH)	25x250x99mm

\*1 switchable among 0.001g/0.002g/0.005g/0.01g/0.02g



### Options

Models	Option name
UD-1	Display unit

Counting Mode
Percent Mode
Carat Mode
Monme Mode
Coefficient Mode
Specific Gravity Mode
Animal weighing mode
Statistic Calculation Mode
Stand-by Function
Switching function for min. readability
Display function for actual readability
Switching of Scale range
Double Range
Direction key
Comparator Function
Add/Accumulate Function
Bar Graph Display
Built-in Calibration Weight
RS-232C Output
Printer Output
SO/GLP/GMP corresponding print
Clock/Calendar Function
Buzzer Alarm
RTS Free Download

## High-Accuracy/Fast Response in 56 mm width of top class in the industry.

### Features

- Realized a high-accuracy weighing with min. resolution (0.001g). (UF-620)
- Display resolution 1mg at 5% capacity.: approx. 0.4 sec, Weighing renewal rate at max.100 times/sec, Fast response (UF-620)
- Dust-proof and water-proof: All enclosure is made with stainless steel
- IP65 standards compliant, implement water-proof connector (Optional)
- Able to output data directly to PLC or PC



UF-620  
(Weigh Platter is an option.)

### Common specifications

- Tare Zero to Full weighing range
- Span adjustment Manual operation Span Adjustment with external calibration weight
- Ingress Protection Rating IP65 \*4
- Power source DC +24V ± 10%, 0.1A
- Interface Half duplex RS485, Full duplex RS232C 1200 to 38.4kbps

Model name	UF-620	UF-1200	UF-3200	UF-8000
Capacity	620g	1200g	3200g	8000g
Readability (d)	1mg(0.001g) *1	1mg(0.001g) *1	10mg(0.01g) *1	10mg(0.01g) *1
Repeatability	1mg(0.001g)	1mg(0.001g)	10mg(0.01g)	10mg(0.01g)
Linearity	± 2mg(0.002g)	± 3mg(0.003g)	± 20mg(0.02g)	± 30mg(0.03g)
Stabilization time	0.4 sec. *2	0.4 sec. *2	0.4 sec. *2	0.4 sec. *2
Data updating interval (max.)	Max 106 times/sec. *3	Max 106 times/sec. *3	Max 106 times/sec. *3	Max 106 times/sec. *3
Dimensions(WDH)	56x230x85mm	56x230x95mm		
IP Rating	IP65 *4	×	IP65 *4	×
Exterior	All stainless steel			

\*1 Selectable among 0.001g/0.002g/0.005g/0.01g/0.02g

\*2 In case of load of 5% of full capacity with smallest read-out

\*3 When connecting with display unit, max.50t times/sec.

\*4 With optional water proof connector cable

\*5 Selectable among 0.01g/0.02g/0.05g/0.1g/0.2g

### Options

Models	Option name
UD-1	Display unit
UF WPAN	Weighing pan
UF CB	Connector cable (10m)
UF WPCB	Water proof connector cable (10m)

### Display Unit

Model	UD-1
Display	LCD with Back-light
Power source	DC +24V ± 10%, 0.1A
Dimensions(WDH)	144x130x72mm
Weight	Approx. 700g
Option	AC adapter (100 -240V) Cable between unit and the display(3m, 4.5m, 10m) BCD output



Counting Mode
Percent Mode
Carat Mode
Monme Mode
Coefficient Mode
Specific Gravity Mode
Animal weighing mode
Statistic Calculation Mode
Stand-by Function
Switching function for min. readability
Display function for actual readability
Switching of Scale range
Double Range
Direction key
Comparator Function
Add/Accumulate Function
Bar Graph Display
Built-in Calibration Weight
RS-232C Output
Printer Output
SO/GLP/GMP corresponding print
Clock/Calendar Function
Buzzer Alarm
RTS Free Download



## Peripherals & Accessories

## CBM-910 II Standard Printer

Printer

Simply print the output data from balance

### Features

CBM-910II is dot-matrix standard printer in compact body. It can be connected to VIBRA balance through RS232C output

### Common specifications

Model name	CSP-240
Printing method	Dot matrix
Printing direction	One-way printing
Character configuration	(5+1) × 8
Number of columns per line	24 columns: 144 dots/line
Printing speed	Approx. 2.5 lines/sec.
Character size (W × H)	1.62 × 2.4mm
Character spacing	1.98 mm
Line pitch	3.52 mm
Paper feed speed	Approx. 5.0 lines/s
Paper	Single sheet, copier paper, Total thickness: 0.13mm or less, Paper roll: 57.5 ± 0.5 (W) × 60 or 80 (dia) mm, ID: φ 12 ± 1mm, Core OD: φ 18 ± 1 mm
Power consumption	7 VA
Physical dimension (W × L × H)	106 × 80 × 88 mm
Operating temperature and humidity	0 to 40°C, 35 to 85% (RH)



### Option

Connector RS232C cable  
(D-sub 9pin female, D-sub 25pin male)

## CSP-160 II Statistic Printer

Printer

Easy operation of useful statistics calculation as well as simple printing.

### Features

CSP-160II offers easy operation of useful statistic from weighing results. Contents of output in statistics are: Number of data, Average, Maximum, Minimum, Standard Deviation, Failure ratio, Range and Total. And it can judge "OK", "HI" and "LOW" to limit values which users can set according to its own criteria

### Common specifications

Models	CSP-160II
Character construction	5 × 7 dot matrix
Printing digits	16 digits maximum
Printing speed	Approx. 1 line/sec.
Character sizes	1.8mm(W) × 2.5mm(H)
Dimensions	155mm(W) × 145mm(D) × 48mm(H)
Operation temp	0°C to 40°C, 80%R.H. or less
Power source	AC adaptor (not included)
Ink ribbon	Cartridge ERC-05
Recording paper	45mm(W) × 30m diameter roll paper



### Option

- Ink ribbon 1 set (5 pcs)
- Roll paper 1 set (20 rolls)

# LAS-05D-SD "No wind" Ionizer

Ionizer

Neutrizing electro-static to prevent instable indication

## Features

It is sometimes happen that weighing objects, especially non-conductive material like plastic, generate static electricity. It could influence the weighing results and cause large measurement error. Ionizer is commonly used to neutralize static electricity of weighing objects and in the environment.



## Common specifivcatiouns

Model name	LAS-05D-SD
Ionizing type	DC corona discharge (± both polarity)
Effective ionizing area	50 to 700mm
Ionizing performance	Approx. 8 seconds
Ion balance control method	TAIBS method
Life time of ionization	50,000 operation hours
Life time of needle	6,000 operation hours
Amount of O3 generation	less than 0.04 PPM
Power consumption	2.8 W

# SDI Satellite Second Display

DISPLAY

SDI works as second display in various scene like face-to-face sales in jewelry shops, hang-on display in manufacturing line...

## Features

- Just connect to the printer or RS232C output port of the VIBRA balance (AJ,SJ).
- The power supply of the display is through output port from the balance



## Common specifivcatiouns

Models	SDI
Display	LCD 12.5mm(H)
Dimensions	150mm(W) × 89mm(D) × 60mm(H)
Operation temperature	0°C to 40°C, 80%R.H. or less
Power source	Supplied from the balance
AC adapter	None
Standard cable length	1m
Optional cable	None

# RTS Data Collecting Software

Software

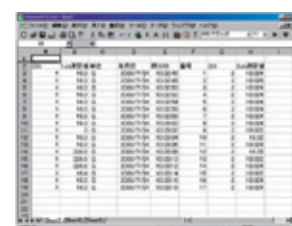
RTS software is a Windows application that connects SHINKO DENSHI'S balance to Windows PC. RTS consists of two types of tools, RTS Log Tool and RTS Input Tool. You can freely download from our website.



RTS Log Tool



RTS Input Tool



## Terminology

### Capacity

Maximum weighable weight value with keeping consistent accuracy of the scale.

### Readability

Value expressed in units of mass of : the difference between two consecutive indicated values, for digital indication.

### Verification intervals

Value expressed in units of mass, used for the classification and verification of an instrument.

### Repeatability

Repeatability is the ability of reading same value under the test condition deems as consistent, with applying the same load to load receptive equipment in the same means for several times.

### Eccentric Error

It refers as "Four Corner Error". The difference between indicated weight value for the weight at any position on the platter and actual weight value.

### Warming Up

Period which makes scale internal circumstances (temperature, etc) ready for weighing after power on.

### Stabilization time

Period from weighing object is placed on to measured weight value is indicated in display.

### Resolution

Ability to identify minimum weight value. It is indicated as "minimum display unit per scale capacity". Smaller in display unit is higher in resolution.

### Instrumental error

Difference in subtracting real value from measured value, or difference value in subtracting real value from nominal value of the Reference Equipment.

### Tolerance

Difference between designated max value and minimum value.

### Reproducibility

Ability showing the same weighing result data even when measuring condition (time, location and measurer. It usually is indicated as standard deviation ( $\sigma$ ). The same result is obtained in several times shows high reproducibility.

### Linearity

Means the shifted amount from the theoretical line connected with two points depending upon each other,

### Traceability

Measurement result or characteristics of standard value associated with the designated reference standards by means of contiguous comparison chain which describes all uncertainties. Standard is usually the National Standards or International Standards.

### Drift

Means scale's gradual and consecutive characteristic declination under the consistent circumstance condition.

### Authentication for trade

Trade means the act of business, regardless of whether compensation is received or not, for bennies package of things or service. And authentication means the authorization act, for the public and/or anyone else of the business, expressing that the certain fact is truth.

### Auto Zero

Means the equipment to clear indication to zero automatically without the intervention by humans.

### Type Approval

Means the country approval of the scale type, provided that the manufacturer conducts the test (durability and else performance test, depend directly upon type approval) to specific scales whether the scale structure complies with the technical standards designated by ministerial ordinance. in prior to mass production.

### Creep

Means the change in output occurred by the lapse of time under the application of fixed load to scale, while maintaining all environmental condition and other variables consistent.

### Secular change

Means the change in measuring instrument or its elements characteristics after elapsed time usage.

### Weighing range

Means the range from minimum measuring value to scale capacity.

### Calibration

Means the series of operation to nail down the relativeness between the value of measuring instrument/system or true weight apparatus or standard material value, and indicated value of standard material. Calibration operation does not include the adjustment procedure for scale to correct error of the scale.

### Non-automatic weighing instrument

Means the scale needs operator intervention for weighing to apply or remove load to/from platter and to get weighed result. Display or print of weighed result can be read directly, and either case they are included in the term of "Display".

### Automatic weighing instrument

Means the scale weighs automatically without having operator's intervention, and operates scale in accordance with the set program for automatic operation.

### Accuracy

Means the degree of measured data agreement with true value, including measured result data correctness and veracity.

### Multi-interval instrument

Means the scale that it's weighing range is divided into portioned weighing range and weighing range is automatically selected corresponding to the applied load increment and decrement.

### Single-interval instrument

Means the scale with single weighing graduation.

### Multiple range instrument

Means the scale having more than 2 different capacity and interval to the same platter, and each weighing range can be expanded from zero to capacity.

### Intrinsically Safe

Means the explosion-proof structure constructed to make ignition source energy lower than firing one."







The brand name "VIBRA" was a compound of Libra and Vibration, and we devised originally. It has been registered a trademark in Japan and also measure countries. We blended "Libra" which means balance and weight of Latin word, with "Vibration" which was the technique that we developed originally. We wish to contribute to the industrial society globally in order that the value of "Vibra" spreads like a vibration wave of the tuning fork.

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