

TM-561E

Table Measure

Operation Manual



Caution

To ensure safe and proper use of the Table Measure:

- Be sure to read this manual carefully.
- After reading this manual, store it in a safe place near the measure, so you can review it as needed.

VIBRA

SHINKO DENSHI CO.,LTD

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General Outline

Thank you for purchasing the Table Measure equipment. This Table Measure is used for measuring the size and mass of a carton, by placing the carton directly against the L, W, and H axes of the Table Measure. This Table Measure also contains an RS232C interface as a standard feature, for use in barcode inputs and measurement data outputs.

Safety Precautions

Be sure to observe the following instructions for safe use:

- To ensure safe and proper use of the Table Measure, please read this operation manual carefully before actually using the unit so you can fully understand the necessary operational details.
- This "Safety Precautions" section sets forth precautionary notes that the user should observe in order to prevent physical injury to the user and/or damage to property.
- Here, precautions are grouped into three categories, i.e., "Warning," "Caution," and "Recommended."



This precaution level indicates that improper handling of the unit can cause serious physical injury of the user.



This precaution level indicates that improper handling of the unit can cause a dangerous status leading to physical injury of the user or any damage to property.



This precaution level indicates that improper handling of the unit can degrade the quality or reliability of the unit.

Meanings of pictorial symbols



Each of the pictorial symbols is accompanied by a specific instruction.

Indicates mandatory requirements that must be followed.



Indicates any prohibited actions.



Warning

 Prohibited	<ul style="list-style-type: none"> Do not use any power source other than by the designated. <ul style="list-style-type: none"> It can cause failures or excess heat generation. Excess heat generation can cause an explosion or fire.
 Prohibited	<ul style="list-style-type: none"> Do not disassemble, modify, or repair the unit. <ul style="list-style-type: none"> It can cause failures or excess heat generation. Excess heat generation can cause an explosion or fire. Please contact our sales representative if any repair work is necessary.
 Prohibited	<ul style="list-style-type: none"> Do not install the equipment at a location where gasoline, thinner, or flammable gas can leak. <ul style="list-style-type: none"> This device is not constructed to be explosion proof. If any flammable gas leaks and accumulates in the neighborhood of this equipment, it may cause an explosion or fire.
 Prohibited	<ul style="list-style-type: none"> Do not use the measure in a location where it may be subjected to excess dust. <ul style="list-style-type: none"> It may cause an explosion or fire. It can cause a failure of the Table Measure.
 Prohibited	<ul style="list-style-type: none"> Never put any heavy materials on the AC adapter cord. <ul style="list-style-type: none"> It may cause a fire or electrical shock.
 Prohibited	<ul style="list-style-type: none"> Do not use the Table Measure if the AC adapter cord is damaged. <ul style="list-style-type: none"> It may cause a fire or electrical shock. Please contact our sales representative for any repair work.
 Prohibited	<ul style="list-style-type: none"> Do not use the measure in a location where it may be subjected to rain or water spray. <ul style="list-style-type: none"> Electric shock or short-circuiting could be caused. It can cause failures or corrosion.
 Prohibited	<ul style="list-style-type: none"> Avoid any location of high ambient temperature or high humidity. <ul style="list-style-type: none"> Electric shock or short-circuiting could be caused. The operating temperature/humidity range of the Table Measure is 5 to 35°C, 35 to 80% RH.







Caution

 Prohibited	<ul style="list-style-type: none"> Do not allow any gap between the adjusters and the floor. <ul style="list-style-type: none"> It can be unstable and a load can slip off the measure.
 Prohibited	<ul style="list-style-type: none"> Do not lay down the AC adapter cord on the floor. <ul style="list-style-type: none"> A person could trip over the cord and drop the measure from the work table.
 Prohibited	<ul style="list-style-type: none"> Do not place the measure on an unstable base or use the measure in a location where it may be subjected to vibration. <ul style="list-style-type: none"> The work subject to measurement can be dropped. The display readout may be unstable.
 Prohibited	<ul style="list-style-type: none"> Do not use organic solvents to clean the body. <ul style="list-style-type: none"> Use dry cloth or a neutral detergent. The transparency of the display window may be degraded. Paint can be peeled or worn.

Recommended

 Mandatory	<ul style="list-style-type: none"> Place the Table Measure on a rigid work table. <ul style="list-style-type: none"> Display readout of the Table Measure will be stabilized.
 Mandatory	<ul style="list-style-type: none"> Set the area of use after installation or relocation. <ul style="list-style-type: none"> By setting the area of use, more accurate mass readout can be obtained.
 Mandatory	<ul style="list-style-type: none"> If the device is not used for a long period of time, turn off the power switch and disconnect the AC adapter from the power outlet. <ul style="list-style-type: none"> This is recommended for safety and also for energy conservation.
 Prohibited	<ul style="list-style-type: none"> Do not leave the measure as it is when the "o-Err" is displayed indicating it is outside the measurement range. <ul style="list-style-type: none"> It can cause a damage or failure of the Table Measure.
 Prohibited	<ul style="list-style-type: none"> Do not apply excess shock. <ul style="list-style-type: none"> It can cause a damage or failure of the Table Measure.
 Prohibited	<ul style="list-style-type: none"> Avoid any location where ambient temperature or humidity varies significantly. <ul style="list-style-type: none"> It can cause inaccurate measurement readouts.

Recommended

 Prohibited	<ul style="list-style-type: none">• Do not use the measure in a location where it may be subjected to outside wind.• The display readout may be unstable.
 Prohibited	<ul style="list-style-type: none">• Do not use the measure on a soft floor.• When the measure is loaded, it may not give accurate readouts because the base can be distorted or inclined.
 Mandatory	<ul style="list-style-type: none">• Separate the power supply of the Table Measure from that for welders or compressors.• Any malfunction of the measure could result due to any high level noise interference from the power line.
 Prohibited	<ul style="list-style-type: none">• Do not use the measure in a location where it will be subjected to the direct sunlight.• It can cause inaccurate measurement readouts.

1. Installation and Preparation

1-1. Configuration

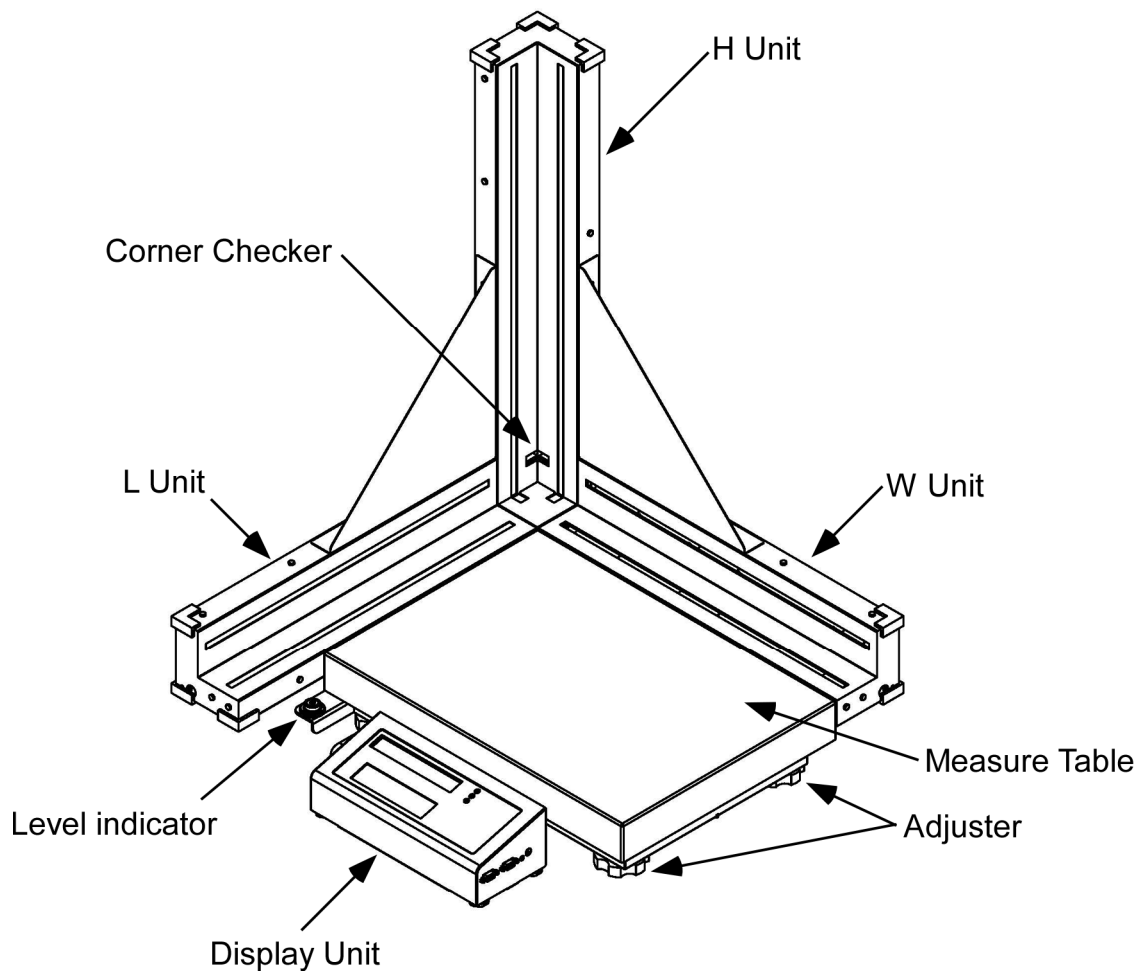
TM-561 generally consists of

3 (L,W,H) units for dimensioning

Scale unit

Display Unit

On the Scale Unit, measure table with the 3 units are placed.

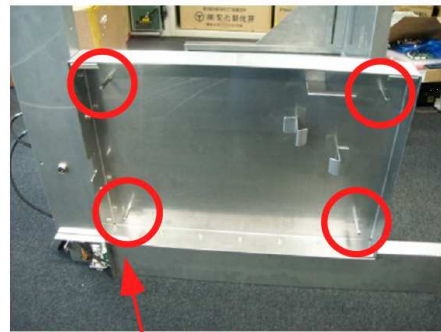
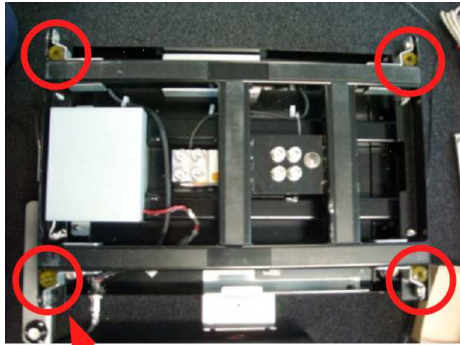


1-2. Assembling

Check the following items in the box

- ① Scale unit
- ② Measure table with L,W unit
- ③ H Unit
- ④ 2 Supportive plates
- ⑤ Corner cover
- ⑥ AC adapter
- ⑦ 10 x Screws
- ⑧ 2 x Cap Screws
- ⑨ Operation Manual
- ⑩ Hexagon wrench

Install the Measure table by fitting the 4 pins into the 4 bushes in the Scale Unit.



Bushes

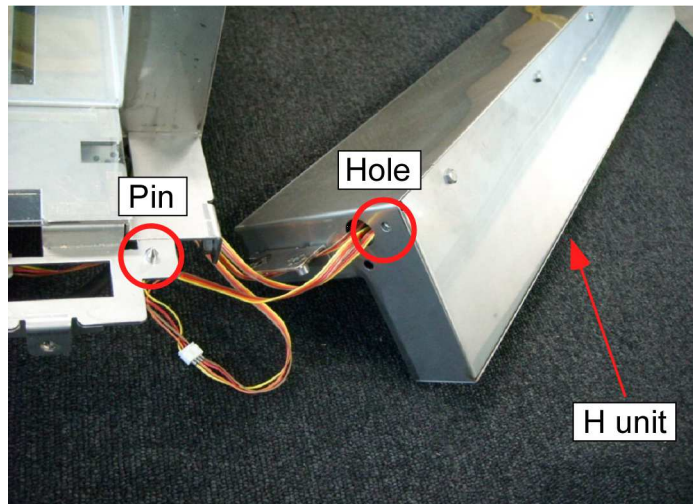


Pins

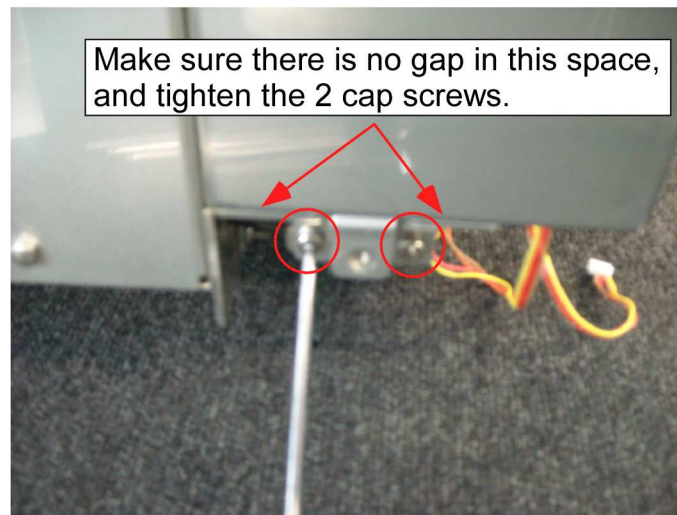
Plug the cable connector from the Scale Unit into the terminal at the bottom of the L unit.



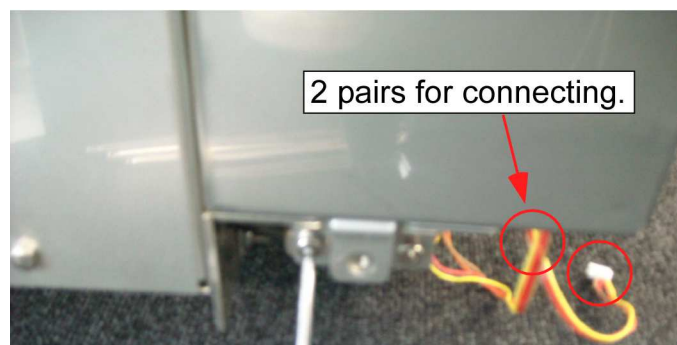
Set the H unit to the Measure Table by fitting the pin into the hole as in the picture.



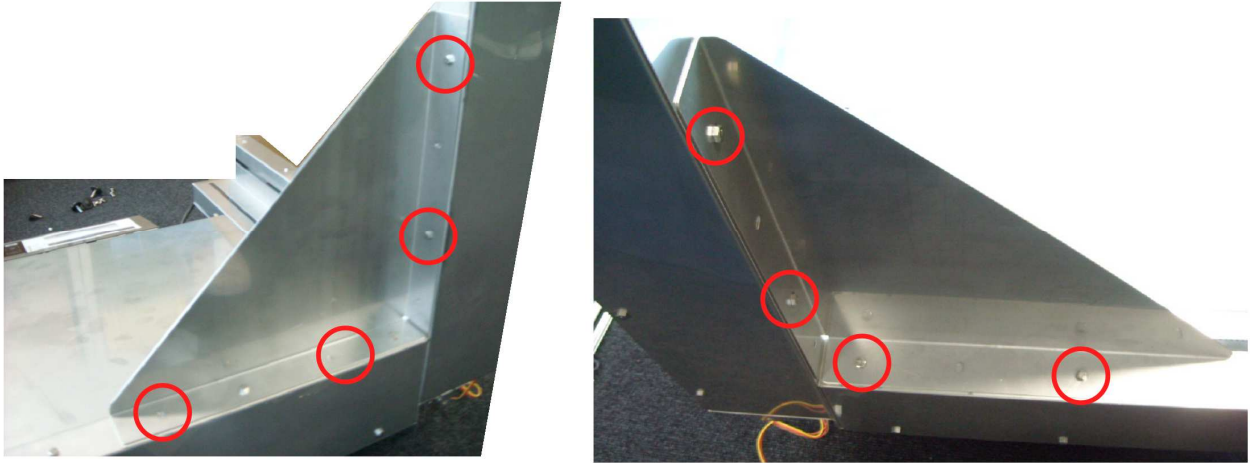
Fix them 2 cap screws.



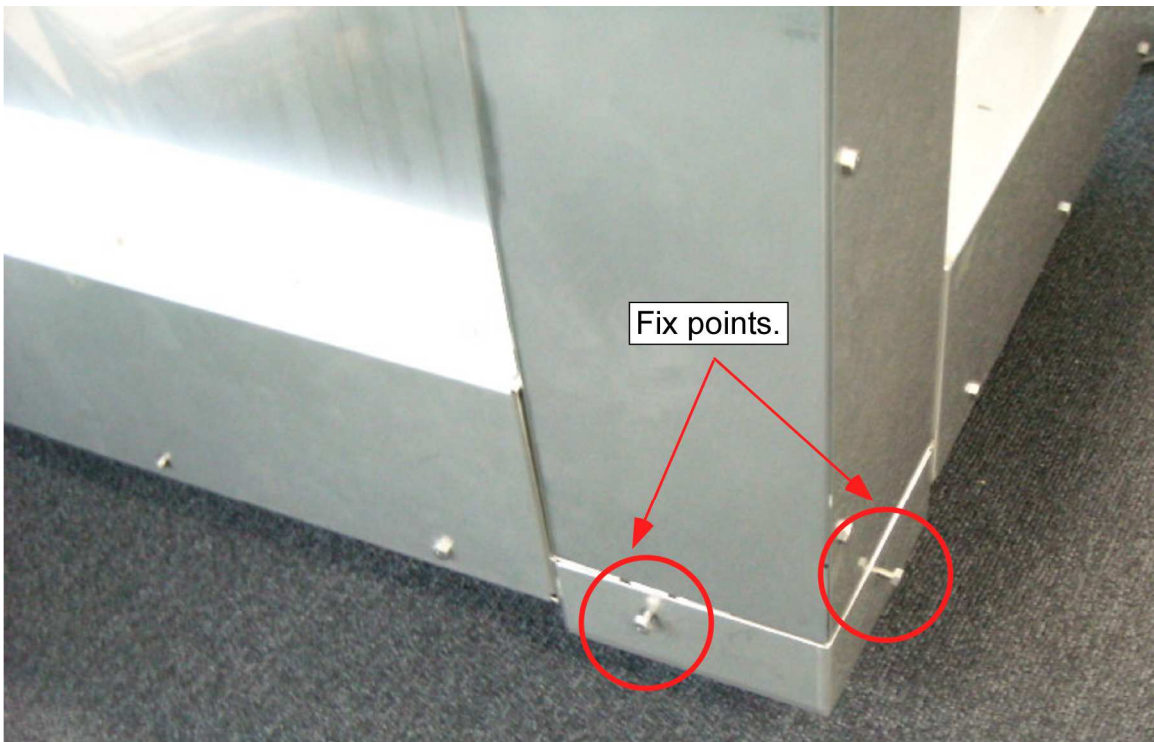
Plug connectors at two points.



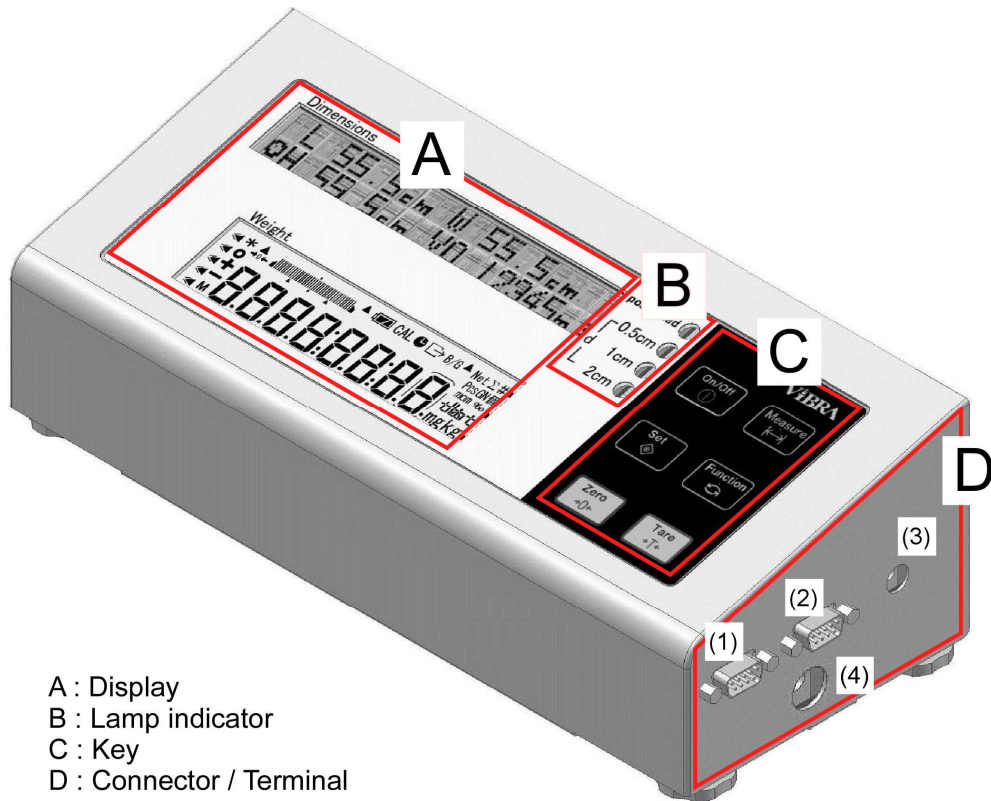
Set 2 supportive plates. 1 between H & L units, 1 between H & W units.
Fix each plate with 4 screws.



Set the corner cover at the bottom of the corner. Fix them 2 screws.



1-3. Display Unit



A : Display
 B : Lamp indicator
 C : Key
 D : Connector / Terminal

A	Display	Dimension Display Scale Display	Dimension data and functions Scale data
B	Lamp Indicator	Positioned d select	Indicates the parcel is placed in the right position and measurement is possible Indicates the selected increment in dimension
C	Key	[On/Off] [Measure] [Set] [Function] [Zero] [Tare]	On / Off Execute measurement in manual mode Set function in function setting Call and forward function settings Return to zero in weighing Tare in weighing. Normally not used
D	Connector / Terminal	(1) BCR (2) RS-232C (3) POWER (4) USB	RS-232C input for barcode reader RS-232C output for PC DC jack for dedicated AC adapter USB type B output for PC

1-4 Basic Operation and Scale Calibration

1-4-1 Basic Operation

- (1) If using a barcode reader, connect the BCR connector to the BCR terminal on the side of the Display Unit. See function setting for BCR selection.
- (2) Connect the AC adapter to the DC input jack on the side of the Display Unit.
- (3) Make sure nothing is on the measure table, and press the [On/Off] switch to turn on.

The following messages appears on the Dimension Display at default setting

. (approximately 30 seconds)

CHECK SUM	PROGRAM NUMBER	AUTO MODE
XXXXX	XXXXX	READY

The scale display should show 0.00kg with stable mark.

- (4) In Auto mode (default setting), place a carton at the right position.
Measurement is completed and the result is on each display.

1-4-2 Scale Calibration

When operated first time after installation, or after period of use, the scale needs to be operated.

Use standard weights set of total 50kg.

Failure of calibration in necessary time, would lead to inaccurate weighing or measurement errors..

Follow the procedure below.

- (1) Call 「6.CAL 」 in the function setting. (See function setting in detail) .
- (2) Make sure nothing on the measure table, and press the [Set] key to start calibration. On the Scale Display, shown 「on 0」 and then 「on F.S.」 .
- (3) Place the standard weight s set of 50kg ※, and keep stable.
- (4) After a couple of seconds, calibration is completed, and back to measurement mode.

* Calibration could be possible with weights of 15kg or higher, however, with full capacity(=50kg) is strongly recommended.

2. Operation in each Measurement Mode

This Table Measure is used for measuring the size and mass of a carton, by placing the carton directly against the L, W, and H axes of the Table Measure equipment. In all of the measurement methods described in the following paragraphs, the carton should be placed on the measure in such a way that the corner of the carton is exactly placed against the corner formed by the L, W, and H axes. **If there are gaps exceeding the allowed space between the carton and the axes, a measurement could not be performed.**

Check before placing a carton that the mass display is showing exactly 0.00 kg. If not, press the Zero key to display an exact 0.00 kg.

To set a measurement mode, call "**MODE SELECT**" and select one of the three modes. See Function Setting in details.

2-1. Automatic Measurements

- (1) Set the MODESELECT to "**1. AUTO MODE**".
- (2) Scan the barcode if necessary.
- (3) Place the carton at the corner and check if the "Positioned" light is on.
Measurement is performed when the mass is stabilized.

2-2. Manual Measurements

- (1) Set the MODESELECT to "**2. MANUAL MODE**".
- (2) Scan the barcode if necessary.
- (3) Place the carton at the corner and check if the "Positioned" light is on.
- (4) Press the [Measure] key. Measurement is performed when the mass is stabilized.

2-3. Automatic Measurement after Reading Barcode

- (1) Set the MODESELECT to "**3. BARCODE MODE**".
- (2) Place the carton at the corner and check if the "Positioned" light is on.
- (3) Scan the barcode. Measurement is performed when the mass is stabilized.

The following conditions commonly apply to all the measurement methods described in the above paragraphs:

- (1) It is necessary to once unload the carton before performing the next measurement.
- (2) A barcode and the corresponding measurement value are paired for output as a set of measurement data.
- (3) Once the data is output, the barcode is cleared.

○ Specifications

1. General Specifications

Measurement method	(1) Length: Infrared beam method (2) Mass: Electric resistance method
Length measurement range	(1) L-axis (length): 9.5 cm to 56.5 cm (10 cm to 56 cm for the interval of 1 cm and 2cm) (2) W-axis (width): 9.5 cm to 56.5 cm (10 cm to 56 cm for the interval of 1 cm and 2cm) (3) H-axis (height): 0.5 cm to 63.5 cm (1 cm to 63 cm for the interval of 1 cm) 2 cm to 62 cm for the interval of 2 cm))
Increment in dimensioning	0.5 cm, 1 cm , 2 cm (selectable)
Weighing capacity/Scale interval	50.0 kg / 0.01 kg or 0.05 kg (selectable)
Weighing accuracy	Repeatability 0.02 kg, Linearity ± 0.02 kg
Tare	Instantaneous tare available up to the weighing capacity.
Operating temperature/humidity range	Temperature: +5 to 35°C, Humidity: 35 to 80% RH (no condensation)
Displays and Indications	(1) Dimensioning 20 digits x 2 lines, Character height 9.66 mm, LCD with backlight (2) Weighing 4 digits x 1 line, Character height 16.5 mm (3) 5 mm diameter LEDs (red) for [Positioned] & Dimension Increment Setting
Operation panel	Material: PET [Zero] key: For zero adjustment [Tare] key: For tare ranging [Function] key: For calling various functions [Measure] key: To start a manual measurement [On/Off] key: On/Off power [Set] key: For setting various functions
Power supply	Custom-made AC adapter Input 100-240 VAC $\pm 10\%$, Output 6 VA
Device Weight	Approximately 30 kg

2. Input/Output Data

1.Barcode reader input	Provided as standard. RS232C, Dsub 9 male
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Connector pinout:

Pin No.	Designation
1	
2 Input	RXD
3	
4	DTR
5	SG
6	
7	RTS
8	CTS
9	

Mating plug: D-Sub 9 pin female (DDK 17JE-13090-02(D8C2) or equiv.)

Inside Unit

2.Measurement data input/output	Provided as standard. Bidirectional RS232C, Dsub 9 male & USB Type-B TM format: Barcode + Measurement number + Length + Width + Height + Mass + Volume
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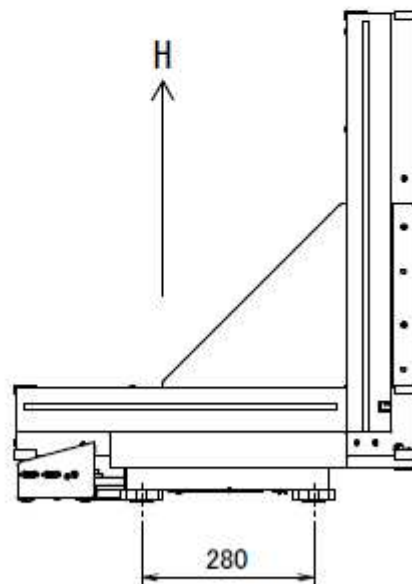
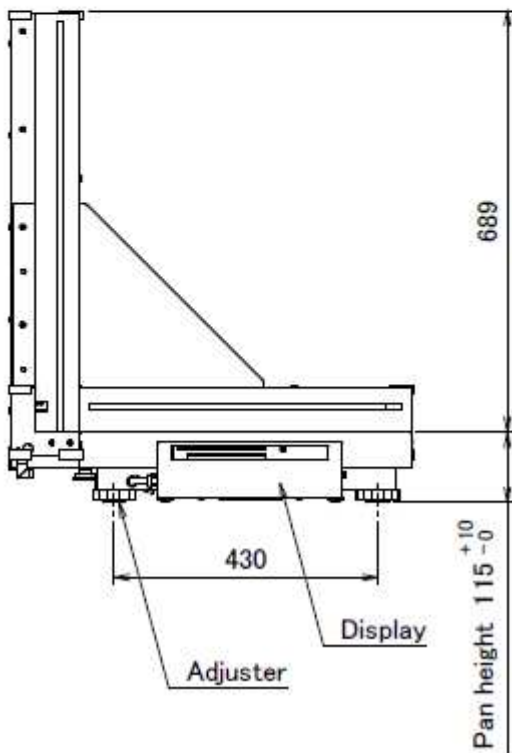
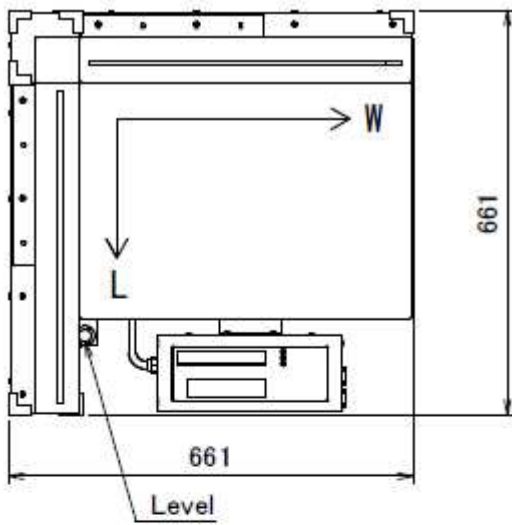
Connector pinout:

Pin No.	Designation
1	
2 Input	RXD
3 Output	TXD
4	DTR
5	SG
6	
7	RTS
8	CTS
9	

Mating plug: D-Sub 9 pin female (DDK 17JE-13090-02(D8C2) or equiv.)
USB Type-B female

Inside

3. Outline Drawings (for reference)



4. Function Setting

Press and hold down the [Function] key until it comes to display 「1. MODE SELECT」.

Then, release the key. Press the [Function] key to display each Function setting. To go into setting display in each Function, press the [Set] key. To change the setting in each function, press the [Function] key. Press the [Set] key to select, and press the [Zero] key to go back to measuring mode.

The symbol ☆ indicates default settings at the time of factory shipment.

Function	Selections	Remarks
1.MODE SELECT	☆ "1. AUTO MODE "	Measured once the object is set.
	"2. MANUAL MODE "	Measured once the [Measure] key is pressed.
	"3. BARCODE MODE "	Measured once barcode is read.
2. RANGE SETTING	☆ " 0.5cm "	Increment in dimension is 0.5cm .
	" 1cm "	Increment in dimension is 1cm .
	" 2cm "	Increment in dimension is 2cm .
3. BUZZER SETTING	☆ " 1. BUZZER ON "	Buzzer sound enable
	" 2. BUZZER OFF "	Buzzer sound disable
4. SCALE SETTING	" 0.01kg "	
	☆ " 0.05kg "	
5.BARCODE SETTING	☆ "BC1 9600, 7,2, EVEN"	9600bps, 7 data bits, 1 start bit, 2 stop bits, even parity, CR/LF terminator
	"BC2 9600, 7,1, EVEN"	9600bps, 7 data bits, 1 start bit, 1 stop bit, even parity, CR/LF terminator
	"BC3 9600, 8,1, NONE" 1.25 SHARE	9600bps, 8 data bits, 1 start bit, 1 stop bit, no parity, CR/LF terminator
6.CAL		For scale calibration
7.INITIALIZE		To set default function setting
8.CORNER SETTING	☆ " 1.SENSOR ON "	Corner sensor enable
	" 2. SENSOR OFF "	Corner sensor disable

※When there is not a corner sensor, item 8 is not displayed

5. Data Output Format

1. Communication Parameters

Data rate 9600 bps
 Data bits 7 bits
 Parity bit Even parity
 Stop bit 1 bit

2. Data Output Protocol

None (After measurement, data is output once. Nonprocedural transmission.)

3. Format Type

TM format: Fixed 30 characters barcode data + Enhanced MB format

3-1. TM Format Details

Character No.	Number of characters	Designation	Description	Codes used/remarks
1	1	STX	Record header	02h
2	1	B	Header of barcode data	42h
3 to 32	30		Barcode data	Alphanumeric characters and symbols
33	1	A	Header of measurement number	41h
34 to 37	4		Measurement number data 0001 to 9999, without zero suppression	30h to 39h
38 to 39	2		Manufacturer check code	*1
40	1	L	Header of length data	4Ch
41 to 45	5		Length data (numeric-only, with zero suppression. Blanks for unused digits, right-aligned.)	30h to 39h, 20h
46 to 47	2		Unit of length data (cm)	63h, 6Dh
48 to 49	2		Status of length data	30h to 39h
50	1	W	Header of width data	57h
51 to 55	5		Width data (numeric-only, with zero suppression. Blanks for unused digits, right-aligned.)	30h to 39h, 20h
56 to 57	2		Unit of width data (cm)	63h, 6Dh
58 to 59	2		Status of width data	30h to 39h
60	1	H	Header of height data	48h
61 to 65	5		Height data (numeric-only, with zero suppression. Blanks for unused digits, right-aligned.)	30h to 39h, 20h
66 to 67	2		Unit of height data (cm)	63h, 6Dh
68 to 69	2		Status of height data	30h to 39h
70	1	M	Header of mass data	4Dh
71 to 76	6		Mass data (6-digit number with decimal point, right aligned) Only positive values.	30h to 39h, 2Eh
77 to 78	2		Unit of mass data (kg)	6Bh, 67h
79 to 80	2		Status of mass data	30h to 39h
81	1	V	Header of volume data	56h
82 to 92	11		Volume data (8-digit number with decimal point, right aligned)	30h to 39h, 2Eh
93 to 94	2		Unit of volume data (m ³)	6Dh, 33h
95 to 96	2		Status of volume data	30h to 39h
97 to 98	2	BCC	Checksum	*2
99	1	ETX	Record footer	03h

3-2. Example Records in TM Format

1
STX
02h

Barcode B
 9000970101101-4
 80009700△△△△△△△△

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
B	9	0	0	0	9	7	0	1	0	1	1	0	1	-	4
42h	39h	30h	30h	30h	39h	37h	30h	31h	30h	31h	31h	30h	31h	2Dh	34H

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
8	0	0	0	9	7	0	0	△	△	△	△	△	△	△
38h	30h	30h	30h	39h	37h	30h	30h	20H	20H	20H	20H	20H	20H	20H

33	34	35	36	37	38	39
A	0	0	0	1	*1	*1
41h	30h	30h	30h	31h		

Measurement No. A Check code *1
 0001

40	41	42	43	44	45	46	47	48	49
L	△	5	5	.	5	c	m	0	0
4Ch	20h	35h	35h	2Eh	35h	63h	6Dh	30h	30h

Length L
 55.5 cm

50	51	52	53	54	55	56	57	58	59
W	△	5	5	.	5	c	m	0	0
57h	20h	35h	35h	2Eh	35h	63h	6Dh	30h	30h

Width W
 55.5 cm

60	61	62	63	64	65	66	67	68	69
H	△	7	1	.	5	c	m	0	0
48h	20h	37H	31h	2Eh	35h	63h	6Dh	30h	30h

70	71	72	73	74	75	76	77	78	79	80
M	△	3	9	.	9	5	k	g	0	0
4Dh	20h	33h	39h	2Eh	39h	34h	6Bh	67h	30h	30h

81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
V	△	△	△	0	.	2	2	0	2	3	8	m	3	0	0
56h	20h	20h	20h	30h	2Eh	32h	32h	30h	32h	33h	38h	6Dh	33h	30h	30h

97	98	99
*2	*2	ETX
		03h

Volume V
 0.220238 m³

*1 Manufacturer check code

This field is reserved for the manufacturer and should be ignored.

*2 Checksum value

Character codes (2 digit hex code for 1 byte) of the character number 2 through 96 are summed (in hex) and the resulting lower 1 byte of the 2 bytes hex checksum number is represented by 2 digits (2 characters) ASCII code.

3-3. TM Format Status Details

Character No.	Description	Status	Definition
48, 49	Status of length data	00	Normal data
		01	No measurable object is present or the work size is below the measurable range.
		02	The sides of the work are not suitably pushed against optical detector portions.
		03	Insufficient intensity of light.
		11	The work size is larger than the measurable range.
58, 59	Status of width data	00	Normal data
		01	No measurable object is present or the work size is below the measurable range.
		02	The sides of the work are not suitably pushed against optical detector portions.
		03	Insufficient intensity of light.
		11	The work size is larger than the measurable range.
68, 69	Status of height data	00	Normal data
		01	No measurable object is present or the work size is below the measurable range.
		02	The sides of the work are not suitably pushed against optical detector portions.
		03	Insufficient intensity of light.
		11	The work size is larger than the measurable range.
79, 80	Status of mass data	00	Normal data
		01	Data is unstable
		11	The mass is less than the measurable range.
		12	The mass exceeds the measurable range.
95, 96	Status of volume data	00	Normal data
		10	Any of L, W, H, and Corner-Checker values are abnormal and thus calculation cannot be made.
		02	The sides of the work are not suitably pushed against optical detector portions.

4. List of Error Codes for TM-561 Measurements

	Display	Data status	Error details	Remarks
Length	L:ERR-01	01	No measurable object is present or the work size is below the minimum measurement.	
	L? XX.X cm	02	The sides of the work are not suitably pushed against optical detector portions.	
	L:ERR-11	11	The work size exceeds the upper limit of measurement.	
	L:OFF ERR		Either the light path is blocked or the work has not been placed on the pan.	
	L: SEN ERR	03	Intensity of transmitted light is insufficient.	
	L:ON ERR		The detector is on while light is not emitted.	

Width	W:ERR-01	01	No measurable object is present or the work size is below the minimum measurement.	
	W? XX.X cm	02	The sides of the work are not suitably pushed against optical detector portions.	
	W:ERR-11	11	The work size exceeds the upper limit of measurement.	
	W:OFF ERR		Either the light path is blocked or the work has not been placed on the pan.	
	W: SEN ERR	03	Intensity of transmitted light is insufficient.	
	W:ON ERR		The detector is on while light is not emitted.	

Height	H:ERR-12	01	No measurable object is present or the work size is below the minimum measurement.	
	H? XX.X cm	02	The sides of the work are not suitably pushed against optical detector portions.	
	H:ERR-10	11	The work size exceeds the upper limit of measurement.	
	H:OFF ERR		Either the light path is blocked or the work has not been placed on the pan.	
	H: SEN ERR	03	Intensity of transmitted light is insufficient.	
	H:ON ERR		The detector is on while light is not emitted.	

Mass	M= XXX.XX kg	01	Mass data is unstable.	"Stable" lamp is off.
	M: u-Err	11	The mass is less than the measurable range.	
	M: o-Err	12	The mass exceeds the measurable range.	
	M: b-Err	13	Malfunction of the measure.	

Volume	V:ERR-10	10	Any of L, W, H, and Corner-Checker values are abnormal and thus calculation cannot be made.	
		02	The sides of the work are not suitably pushed against optical detector portions.	