

BW/CW/VW/BWS

SERIES

WEIGHING INDICATOR



TECHNICAL MANUAL

TSCALE



Declaration of Conformity

Manufacturer	Taiwan Scales Mfg. Co., Ltd
Model	BW/BWS/VW/CW
Attestation No	06061503-A
EMC Directive	89/336/EEC
Applicable Standards	EN 55022: 1998 / A1:2000 / A2-2003 (Class B) EN 55024: 1998 / A1:2001/ A2:2003 EN61000-3-2: 2000, EN 61000-3-3: 1995 / A1: 2001

Note: The declaration is only valid if the non-automatic weighing instrument was verified by the manufacturer or with a certificate of conformity issued by a notified body.

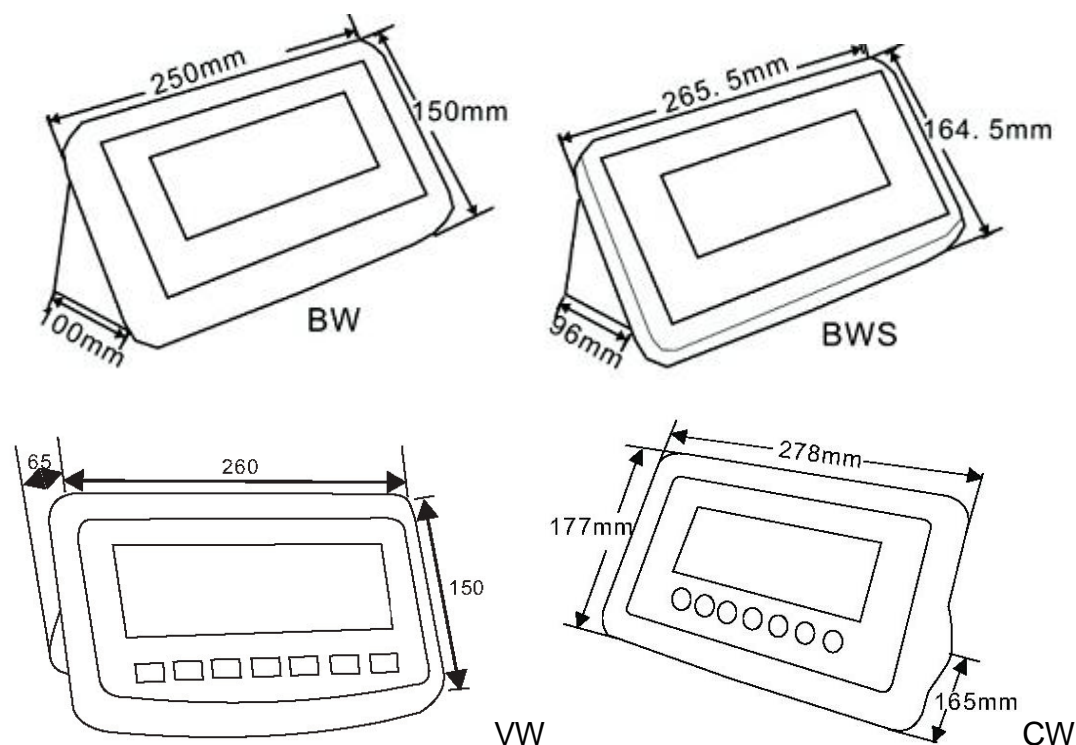
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1. SPECIFICATION



Model	BW/VW/CW	BW-E	BWS	BWS-E
Display	52mm LCD	1.2" LED	52mm LCD	1.2" LED
Housing	ABS Plastic		SST	
Operating Temperature	-10 °C - 40 °C / 14 °F - 104 °F			
Resolution	1/6000 (OIML Approved)			
Key Pad	7 Keys			
Power	AC Adaptor (12V/500mA)/ Battery (6V/4Ah)			
Calibration	Automatic External			
Interface	RS-232 Output Optional			
Load cell drive Voltage	Max: 5V/150mA			
Load Cells	Up to 4 load cell			
ADC	Sigma Delta			
ADC Update	≤1/10 second			
Stabilization Time	One seconds typical			

2. INTRODUCTION

- The BW/CW/VW/BWS series weighing indicator that amplifies signals from a load cell, converts it to digital data and displays it as a mass value.
- It is suitable for general weighing or more specialized applications such as check weighing, animal weighing and accumulation applications.
- It can connect the indicator to a printer or a PC.
- Large LCD with white LED back light or LED displays

3. INSTALLATION

Precautions



- The weighing indicator is a precision electronic instrument, handle it carefully.
- Do not install the scale in direct sunlight.
- Verify the local voltage and receptacle type are correct for the scale.
- Only use original adaptor, other could cause damage to the scale.
- Pluggable equipment must be installed near an easily accessible socket outlet.
- Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.
- Avoid sudden temperature changes, vibration, wind and water.
- Avoid heavy RF noise.
- Keep the indicator clean.

Parts Description



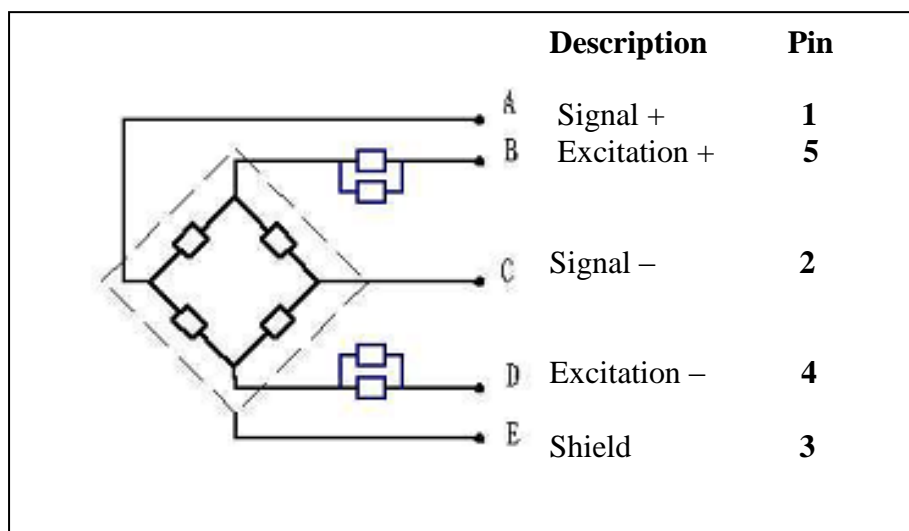
Installation

- Place the Indicator on a table or connect with proper stand.
- Connect the platform load cell cable in to the indicator load cell connector. Load cell connector is located back side of the indicator.
- Connect the adaptor pin in to the indicator adaptor jack. Adaptor jack is located, back side of the indicator.
- Adaptor connects into your AC power socket. Pluggable equipment must be installed near an easily accessible socket outlet with a protective ground/ earth contact.
- Turn on the On/Off key. If you want to turn off, press the key again.
- Display will be shown the scale capacity and will be starting self checking.
- After self checking, display will be come to normal weighing mode.
- Warm-up time of 15 minutes stabilizes the measured values after switching on.
- Calibrate with exact calibration weights, minimum 1/3 of the scale capacity want to use for calibration. For calibration see details in parameter.

Then you can start your operation

Load cell connections

- Connect the load cell cables to the terminal as shown below.



- It can connect four 350 ohm load cells.
- The load cell drive voltage is 5V DC $\pm 5\%$ between Excitation + and Excitation -.

Connect Adaptor and Charging








- To charge the battery insert the adaptor pin to jack. Adaptor simply plug into the mains power. The scale no needs to be turned on.
- The battery should be charged for 12 hours for full capacity.
- Left down side of the keyboard there is an LED to indicate the status of battery charging. When the scale is plugged into the mains power the internal battery will be recharged. If the LED is green, the battery has a full charge. If it is red, the battery is nearly discharged and if yellow, the battery is being charged.
- Do not use any other type of power adaptor than the one supplied with the scale.
- Verify that the AC power socket outlet is properly protected.

Note: Please charge the battery before using the scale for the first time.







4. KEYS DESCRIPTION

Key Board

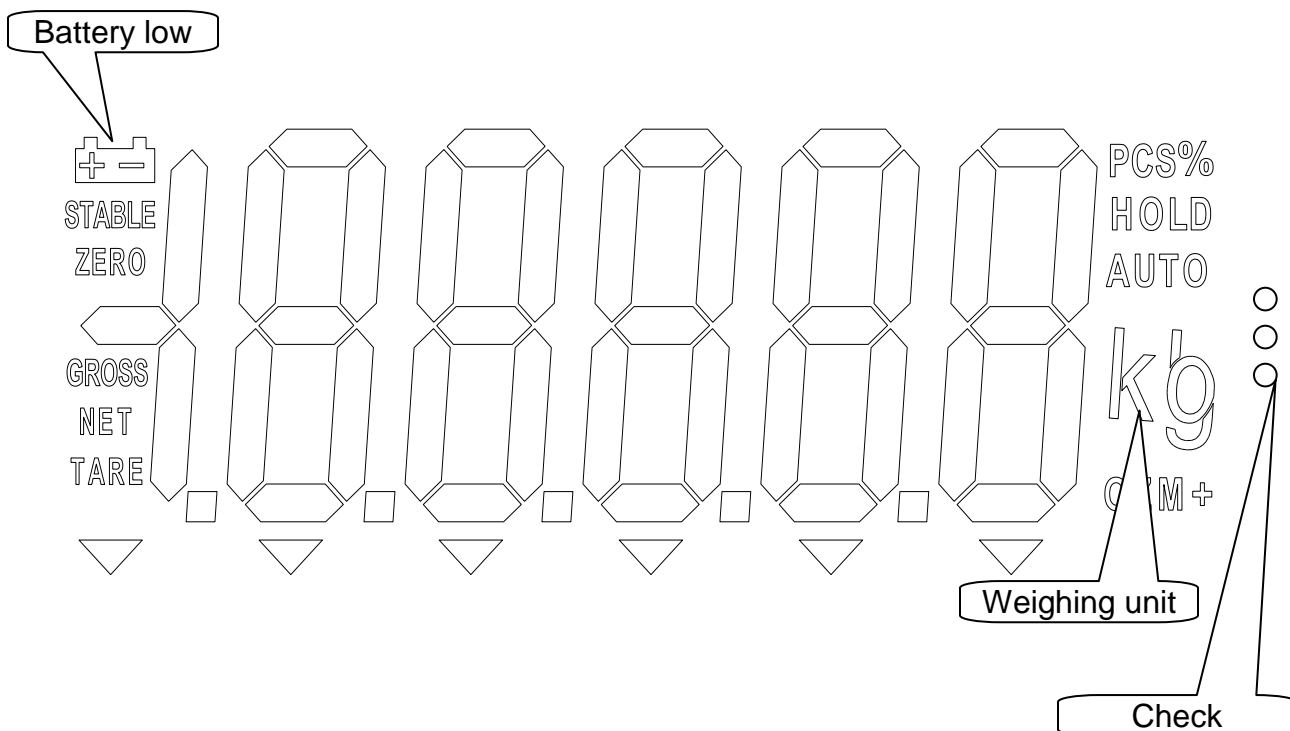


Keys	Description
	Power turn ON/OFF
	Set the Zero Display
	To perform a tare function, Subtracts weights.
	Memory recall key, show the stored values from the memory
	Accumulator key, current values will store to the memory
	To send the data to printer or PC
	Shift to Gross / Net Weight. To change Unit hold three seconds.

Secondary functions of the keys

Function	Keys
To confirm the selected menu	
To change the menu and active digit	
To move the active digit to right	
To move the active digit to left	
To enter in to the menu	
Escape from the menu to normal operation.	

Display



5. OPERATION

Initial Start-up

Warm-up time of 15 minutes stabilizes the measured values after switching on.

5.1. Basic Operation


1. Power On/Off:

Switch on the balance by pressing on/ off key.


The display is switched on and the test is started and if want to switched off, press again the key.



2. Zero

Environmental conditions can lead to the balance exactly zero in spite of the platform not taking any strain. However, you can set the display of

your balance to zero any time by pressing  key and therefore ensure that the weighing starts at zero.

3. Tare

The weight of any container can be tared by pressing  button so that with subsequent weighing the net weight of the object being weighed is always displayed.

- Load weight on the platform.
- Press  key. Zero is displayed, and tare is subtracted.
- Remove weight on the platform. Tared weight is displayed. It can set only one tare value. It will be shown with a minus value.
- Press G/N to change between gross weight and net weight.
- To clear the tare value, remove the load and press  key. Zero is displayed, tare weight is cleared.














4. Select Unit

Press and hold three seconds  key, it can change to unit.





5.2. Check Weighing

It can set an upper or lower limit when weighing with the limits range. During the limit controls dividing the unit will indicate whether a value upper or lower limits with an alarm sound .

5.2.1. Set Limits

- Press  and  key together, display will be show *SEt H*
- Press  key to select *SEt H* or *SEt L*
- Press  key to confirm, display will show *00000* and will blink the last digit.
- Enter the high limit value by using  and  keys to change the active digits and press  key to increment the value.
- Press  key to confirm, display will show *SEt L*
- Enter the high limit value by using  and  keys to change the active digits and press  key to increment the value.
- Press  key to confirm.
- To escape from the settings press  key.


5.2.2. Set Check Weighing

- Press  and  key together, display will be show *SEt H*
- Press  key to select display *bEEP*.
- Press  key to confirm, display will be shown *no* or *oL* or *nG*
- **Check mode *no*** : No beep sound in the limits. Function turned off.
- **Check mode *oL*** : When the weight is between the limits. OK will shown and beeper will be sounded.


- **Check mode \overline{M}** : When the weight is out of the limits, the beeper will be sounded and OK will shown.

Note: Check weighing available only when weight more than 20d

5.3. Accumulation

The scale can be set to accumulate manually by pressing  key. For settings, see the parameter $P \geq \text{Coñ} \gg \overline{\text{nodE}} \gg Pr \geq$
 Before operation scale should be stable and return to zero, accumulation available only when weight more than 20d

Accumulation Operation

- Place the load on the platform.
- Press  key, when displayed STABLE indication.
- Display will be show $ACC \ 1$ then will be show the total saved value. These displays will be shown only three seconds.
- Remove the weight from the pan.
- When display get zero and stable then place the second weight.
- It can continue until the memory gets fully or 99 items.

5.3.1 Memory Recall

To recall the memory press  key.

Display will be show $ACC \ X$ (X: Total number of accumulation) then will be show the total saved value. These displays will be shown only three seconds.

5.3.2. Memory Clear

To clear the memory, press  and  keys together.

Display will be show $ACC \ 0$, all accumulation memory cleared from the memory.


5.3.3. Automatically accumulation.


The scale can be set to accumulate automatically. For settings, see the parameter $P \geq \text{Coñ} \gg \overline{\text{nodE}} \gg \text{Auto}$

Automatic Accumulation Operation

- Place the load on the platform.
- When display gets STABLE indication, display will be show *ACC 1* then will be show the total saved value. These displays will be shown only three seconds.
- Remove the weight from the pan.
- When display get zero and stable then place the second weight.
- It can continue until the memory gets fully or 99 items.


5.4. Parts Counting


To enter the parts counting, press and hold  key display will be show *P 10*

Press  to change the parts quantity.

Options: *P 10 / P 20 / P 50 / P 100 / P 200*

Parts Counting Operation

- Select the parts quantity as per the option
- Place the load on the platform
- Press  key to confirm, display will be shown *----* then will show the quantity
- Then can add goods on the platform, display will update the parts quantity automatically



Press  key to change normal mode, when in counting mode.

5.5. Animal Weighing

BW/BWS/VW can use for vibrate loads weigh. This function can use for animal weighing. For settings, see the parameter *P 4 oLH » An*

Bring the load on the platform, when the load few seconds get stable, the reading will be locked for few seconds and will be follow beep.

It can add or remove loads also update the weighing locked values.




To enter or exit animal weighing mode, press  and  key together. When in animal weighing mode **HOLD** indicator will be displayed.

5.6. Keyboard Lock

It can set lock key board, for settings, see the parameter $P\ 4\ oLH\ »\ LoCt$





When the keys are not using with in 10 minutes, the keys will be lock automatically.

After entering into the lock function, when we press the keys display will be show $t-LoL$. Then will come to normal display.

If want to unlock and want to use the keys press and hold  ,  and  keys three seconds. Display will be show $U\ LoL$ Then will come to normal display

5.7. Set auto power off

It can set auto power of the scale, when scale not in use, scale will turn off after the setting time.



- Hold  key three seconds display will show $SEt\ oF$
- Press  key to change $SEt\ oF$ and press  key to confirm
- Press  key to change the options.

$SEt\ oF$	$oF\ 0$	To set auto off function turn off, for scale always on
	$oF\ 3$	Set to turn off three minutes later
	$oF\ 5$	Set to turn off five minutes later
	$oF\ 10$	Set to turn off 10 minutes later
	$oF\ 30$	Set to turn off 30 minutes later



- After select the auto off option press  key to confirm and press  key to escape from the settings.

5.8. Set Back Light

It can set back light when scale in use.





- Hold  key three seconds display will show $SEt\ bL$
- Press  key to confirm


<i>SEtBL</i>	<i>bL AU</i>	To set auto option. When start to use back light will be on and when stop the operation back light also will off.
	<i>bL on</i>	To set always on. After turn on the power, back light also will be on.
	<i>bL oFF</i>	To set back light turn off. No back light in the operations


- After select the back light option press  key to confirm and press  key to escape from the settings.

6. PARAMETERS

To set parameter, you should short K2 jumper, then turn on the scale.

- Press  key during the self checking.
- Display will be show P_n
- Press ,  and  to enter, display will be show P_0 *CHK*

Menu	Sub Menu	Description	
P_0 <i>CHK</i>	<i>SEt H</i>	Set high limits for check weighing	
	<i>SEt Lo</i>	Set low limits for check weighing	
	<i>BEeP</i>	<i>no</i>	No beep for check weighing
		<i>oN</i>	Beep, when check weighing between the limits
<i>nG</i>		Beep, when check weighing out of the limits	
P_1 <i>Coñ</i>	<i>ñodE</i>	<p>This option is used to set accumulation and RS-232 communication</p> <p>Options:</p> <p><i>Cont</i> : data send continues</p> <p><i>St 1</i> : Send data one time, when stable.</p> <p><i>St C</i> : Send data continuously, when stable</p> <p><i>Pr 1</i> : Send data one time, when press print Key (in printer mode)</p> <p><i>Pr 2</i> : Send data to print and accumulation, When press .key</p> <p><i>AUto</i> : Auto accumulate and auto print mode. When weight stable and return to zero.</p> <p><i>RS-</i> : Ask mode, Command R: read data Command T: Tare Command Z: Zero</p> <p><i>ñ ir-ELES</i>: Wireless mode (communication through wireless)</p>	
		<i>BAUD</i>	To set the baud rate. Options: <i>600 / 1200 / 2400 / 4800 / 9600</i>

	<i>Pr</i>	To set the parity Options: <i>7 E 1 1 7 0 1 1 8 n 1</i>	
	<i>PtYPE</i>	To set printer model Options: <i>LPJ P</i> : set the Tscale printer tpup <i>LP50</i> : Set the Tscale printer LP-50	
<i>P 2 CAL</i>	<i>DEC</i>	To set to use decimal Options; <i>0 1 00 1 000 1 0000</i>	
	<i>dUAL</i>	<i>oFF</i>	<i>r 1 inC</i> To select the scale division. Options: <i>1 1 2 1 5 1 10 1 20 1 50 1 100 1 200</i> <i>r 1 CAP</i> To set the scale capacity
		<i>oN</i>	<i>r 1 inC</i> To select the scale division. Options: <i>1 1 2 1 5 1 10 1 20 1 50 1 100 1 200</i> <i>r 1 CAP</i> To set the scale capacity. Then press  to set <i>r 2 inC</i> and <i>r 2 CAP</i>
	<i>CAL</i>		To set non linear calibration
	<i>CoUnt</i>		Showing scale internal counts
	<i>GrA</i>		To set local gravity
	<i>P4 oth</i>	<i>LoCk</i>	To set keypad lock Options: <i>oN 1 oFF</i>
<i>Ann</i>		To set animal mode. Options: <i>oN 1 oFF</i>	









Note: *dU AL* – This function is used to dual interval.

On: Dual interval enables / **Off:** Dual interval disable.








Then can set Capacity and Division

7. CALIBRATION

To set calibration, turn on the scale.

- Press  key during the self checking.
- Display will be show *Pn*
- Press ,  and  to enter, display will be show *Po CH-*
- Press  until display will be show *P 2 CAL*
- Press  key to confirm and press  to select *CAL*
- Press  key to confirm

Calibration *CAL*

- Press  key to enter calibration, display will be show *UnLd*
- Remove all the weight from the platform.
- When indicator get stable, press  key to confirm.
- Display will be show the last calibration weight. If want to change the calibration weight value, press  and  keys to change the active digits and press  key to increment the value.
- When the calibration value is correct, press  key to confirm.
- Display will be show *LoAd*
- Place the calibration weight on the platform.
- When indicator get stable, press  key to confirm.
- Display will com to normal weighing mode

8. RS-232 OUTPUT

8.1. Specifications:

RS-232 output of weighing data
 Code : ASCII
 Data bits : 8 data bits
 Parity :No Parity
 Baud rate : 600bps to 9600bps selectable

8.2. Connector:

RS-232 Output

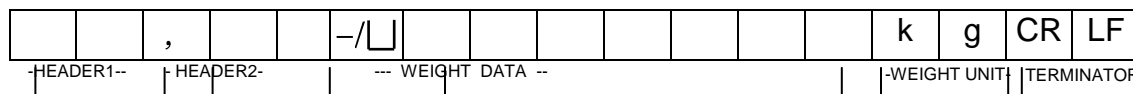
Pin 2: Input
 Pin 3: Out put
 Pin 5: Signal Ground

Check Weighing Output

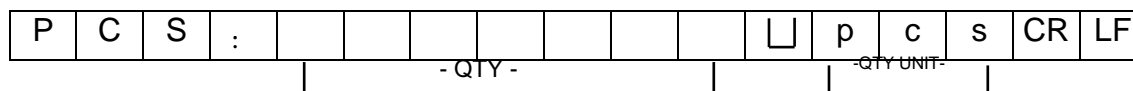
Pin 1 : VB
 Pin 4: Vcc 5v (Output)
 Pin 5: Com (Ground)
 Pin 6: Ok (Output)
 Pin 7: Low (Output)
 Pin 8: Hi (Output)
 Pin 9: Beep (Output)

8. 3. Continuously output protocol

Con1: Weighing mode



Counting mode



HEADER1: ST=STABLE, US=UNSTABLE
 HEADER2: NT=NET, GS=GROSS

Con2:

Header0	Header1	Header2	Header3	Weight1	Weight2	Weight3	Weight4	Weight5	Weight6	Tare1	Tare2	Tare3	Tare4	Tare5	Tare6	Terminator1	Terminator2
---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	-------	-------	-------	-------	-------	-------	-------------	-------------

Header0=02H

Header1 follow decimal point

Decimal point=0, header1=22H

Decimal point=1, header1=23H

Decimal point=2, header1=24H

Decimal point=3, header1=25H

Decimal point=4, header1=26H

Header2 follow weigh status, default value=20H

If in net mode (tare value not 0), header2=header2|01H

If gross weight “-“, header2=header2|02H

If overload or gross weight “-“, header2=header2|04H

If unstable, header2=header2|08H

If weighing unit=kg, header2=header2|10H

Header3 follow weighing unit

If weighing unit=g, header3=21H

If weighing unit=oz, header3=23H

Weight1~weight6: weighing data

Tare1~tare6: tare value

Terminator1: 0DH

Terminator2: 0AH

Con3:

Header0	Header1	Weight1	Weight2	Weight3	Weight4	Weight5	Weight6	Weight7	Unit1	Unit2	Status	Terminator1	Terminator2
---------	---------	---------	---------	---------	---------	---------	---------	---------	-------	-------	--------	-------------	-------------

Header0=01H

Header1 follow weight “+” or “-“

When weight “+”, header1=”+”, when weight “-“, header=”-“

Weight1~weight7: weight data (include decimal point)

Unit1~unit2: weight unit

Status: when stable, status=0, when unstable, status=1

Terminator1: 0DH

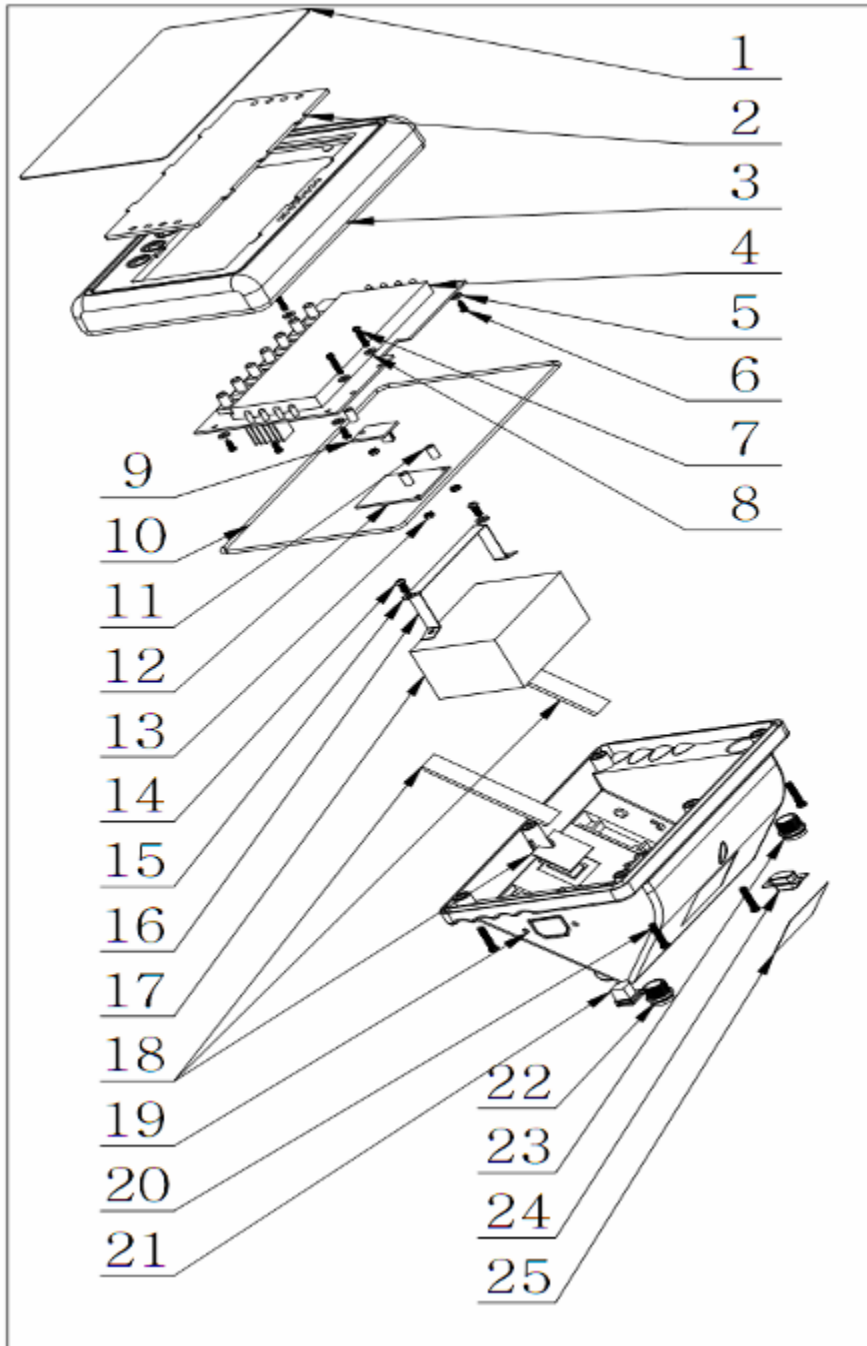
Terminator2: 0AH

9. ERROR CODE

Error Message	Description	Solution
-----	Maximum load exceeded	Unload or reduce weight
<i>Err 1</i>	Incorrect date	Enter the date by using format "yy;mm:dd"
<i>Err 2</i>	Incorrect time	Enter the time by using format "hh:mm:ss"
<i>Err 4</i>	Zero setting error	Zero setting range exceeded due to switching on.(4%max) Make sure platform empty.
<i>Err 5</i>	Key board error	Check the keys and connector.
<i>Err 6</i>	A/D value out of range	Make sure platform empty and check the pan is installed proper. Check the load cell connectors.
<i>Err 9</i>	Unstable Reading	Check any air variation, vibration, RF noise and touching some where. Check the load cell and connectors.
<i>Err 17</i>	Tare out of range	Remove the load and restart scale again.
--oL--	Over range	Remove the load. Re calibrate
<i>FA, L H / FA, L L</i>	Calibration Error	Re calibrate
<i>Err P</i>	Printer error	Check the printer and settings
<i>bA Lo / Lo bA</i>	Battery low	Re charge battery, check the voltages.

12. DRAWING

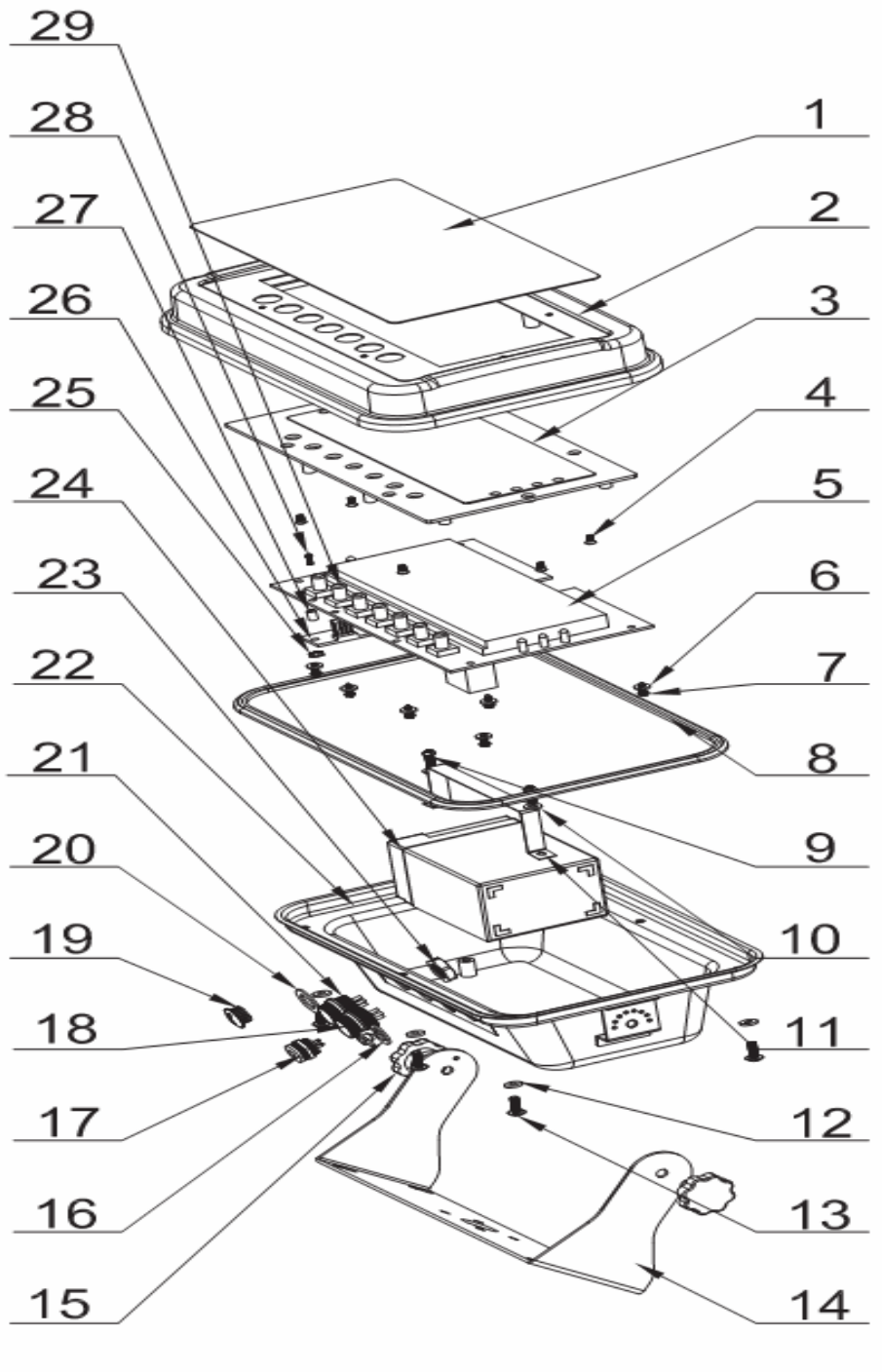
12.1. BW/CW/VW Drawing



12.2. BW/CW/VW Parts List

No	Parts Name	Qty	Spec
1	Key Panel	1	
2	Display Protection Plate	1	
3	Front Cover	1	
4	Main PCBA	1	
5	Insulation Washer	6	8x3.1x1.5t
6	Self Thread Screw	6	3x10
7	Screw	3	M3x16 (Optional)
8	Insulation Washer	3	8x3.1x1.5t (optional)
9	RS-232 PCBA	1	(Optional)
10	Seal Ring	1	
11	Screw Column	3	5.8x3.8x10H (Optional)
12	Analog Output PCBA	1	
13	Nut	3	M3, Hexagon
14	Self Thread Star (+) Screw	2	4x10
15	Washer	2	9x4.4x0.8t
16	Battery bar	1	
17	Battery	1	6V/4Ah
18	Spacer	2	(Optional)
19	Back Cover	1	ABS
20	Self Thread Star (+) Screw	6	4x116
21	AC Adaptor Jack	1	
22	Air Connector	1	5Pin For load cell
23	Air Connector	1	9Pin for Out Put (Optional)
24	D Connector	1	9 Pin (Optional0
25	Name plate	1	

12.3. BWS Drawing



12.4. BWS Parts List

No	Parts	Qty	Spec
1	Key Panel	1	
2	Front Cover	1	
3	Display Protection Plate	1	
4	Nut	6	M3*6
5	Main PCBA	1	
6	Washer	6	8x3.1x1.5
7	Star (+) Self Thread screw	6	M3x8
8	Water Proof Rubber Bar	1	
9	Star (+) Screw	2	M4x10
10	Washer	2	M4
11	Battery Clamp	1	
12	Washer	6	M4
13	Star (+) Big head Screw	6	M4x12
14	Bracket	1	
15	Bracket Screw	2	
16	Water Proof Adaptor jack	1	
17	Interface Module	1	
18	Air connecter	1	5Pin
19	Plug	1	
20	Rubber Spacer	3	
21	Air Connector	1	7Pin
22	Back Cover	1	
23	Air Connector Water Proof Nut	1	
24	Battery	1	6V/4Ah
25	Nut	1	M3x6
26	Main Serial board	1	
27	Spacer	1	
28	Star (+) Screw	1	3Mx20
29	Micro Switch Cap	7	