

T-Scale



Technical Manual

ROW
Precision Balance
V1.20-V1.10
REV:YM1,OCT 2016

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1. SPECIFICATIONS

Overall View



keyboard

pan



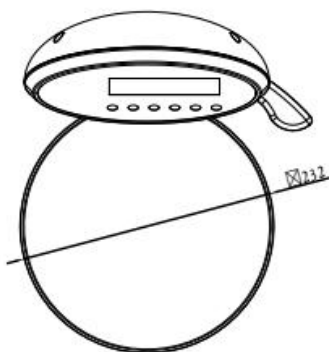
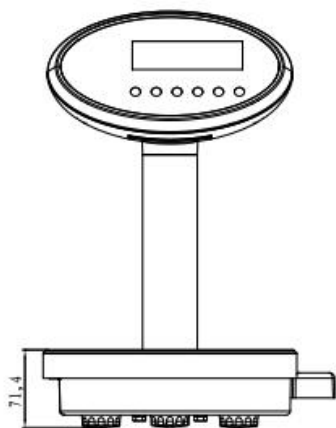
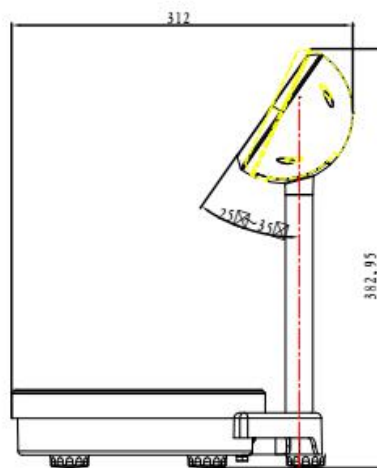
Adjustable foot

RS-232

Adaptor Jack



Dimensions



Model	ROW
Resolution	1/30,000; 1/70,000; 1/150,000
housing	ABS Plastic indicator+ SST pan
Capacity	3kg/7kg/15kg
Stabilisation Time	1 Seconds typical
Operating Temperature	0°C ~ +40°C / 32°F - 104°F
Power supply (external)	AC Adaptor (12V/500mA) / Ni-MH battery (1.2V/2000mAh x 6)
Calibration	Automatic External
Display	6 digits 22mm LCD display, attached backlight
Gross weight	3.8kg
Interface	RS-232 Output Optional
Zero range	0mV~5mV
Signal input range	0~15mV
ADC	Sigma delta
ADC update	Max 60 times /second
Load cell drive voltage	Max 5V/150mA

2. INTRODUCTION

- The ROW series precision balance 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 display

3. INSTALLATION

Unpacking

When you receive the balance, inspect it to make sure that it is not damaged and that all parts are included:

- Remove the Indicator from the carton.
- Remove the protective covering. Store the packaging and to use if you need to transport the scale later.
- Inspect the indicator for damage.
- Make sure all components are included.
 1. Balance
 2. Adaptor
 3. Manual

Installation

- Place the balance 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 balance.
- Connect the adaptor pin in to the indicator adaptor jack. Adaptor jack is located, back side of the balance.
- 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 show the scale capacity and will be starting self-checking.
- After self-checking, display will 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

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 12 hours for full capacity.
- The symbol status of the battery

Battery voltage has dropped



Low voltage



Fully charged

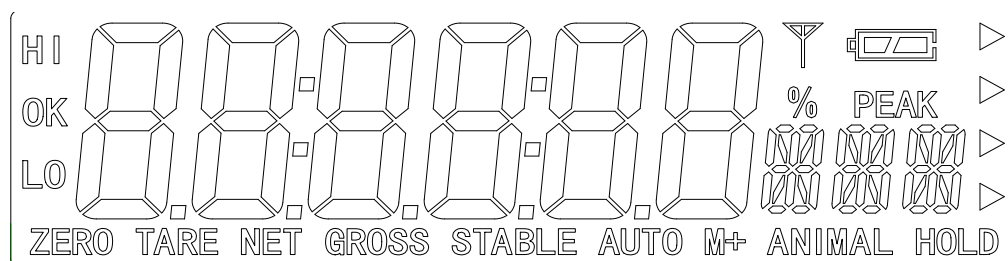


- Do not use any other type of power adaptor than the one supplied with the scale.
- Verify that the AC power socket outlet is properly protected.

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

4. DESCRIPTION

Display



DISPLAY	FUNCTION
HI OK LOW	Check weighing
ZERO	Indicator for Zero display
TARE	Indicator for Tare display
GROSS	Indicator for Gross weight
NET	Indicator for Net weight
STABLE	Indicator for Display stability
AUTO	Indicator for Auto Accumulation
M+	Indicator for Accumulation
ANIMAL	Indicator for Animal Weighing Mode
HOLD	Indicator for Hold/ Lock
	Indicator for Charging status of battery.

Key Board



KEY	FUNCTION
	Turn the power On/ Off
	Used to reset to Zero. In setting mode can use to confirm entry
	Used to recording tare values and change the value from gross value to net value. Insetting mode can use to increase the value and scroll forward in menu.
	When the scale has been tared and display is in gross or net mode. When using the settings mode, can use to move active digits right.
	For print the results, to the PC or printer using the optional RS-232 interface. It also adds the value to the accumulation memory if the accumulation function is not automatic. When using the settings mode,can use to clear active digits
	Switch to unit weight. In setting mode, escape back to menu/ weighing mode. When using the settings mode, can use to move active digits left.

5. OPERATION

Initial Start – Up:

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

5.1. Power ON/OFF:

Switch on the balance by pressing  key.

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

5.2. 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.

5.3. 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 can display 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.

5.4. Sample weighing

- Place goods to be weighed on the platform.
- Wait few seconds for stability display.
- Read the result.
- Avoid overloading. When display appears “ol” reduce the load or unload.

5.5. 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 . For details see the parameter F3 oFF.

- **Check mode 1:** No beep sound in the limits. Function turned off.
- **Check mode 2:** When the weight is between the limits. OK will shown and beeper will be sounded.
- **Check mode 3:** When the weight is out of the limits, the beeper will be sounded and OK will shown.

5.6. Enter to Menu

In the weighing mode, press  and  together.

Display will be appear *FD H-L*

5.7. Set limits

Press  to enter the function.

Press  key to select the limit.

Display will appear *SEt H ,* or *SEt Lo*

Press  key to enter, press  key to move active digits.

Press  to change the value. After enter the value press  to sure.

Press  to escape.

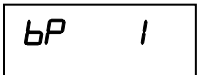
5.8. Set check weighing mode.

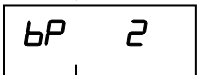
After entering the settings mode,

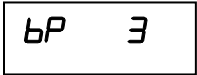
Press  until display will be appear *F3 oFF*

Press  key to enter, press  until display show *bEEP*

Press  key to enter, press

Check mode 1 

Check mode 2 

Check mode 3 

Select desired setting by pressing  and press  key to confirm, press  to escape.

Note: The load weight must greater than 20 scale divisions for the check weighing operations.

To disable the check weighing function, enter zero into both limits.

5.9. Accumulation

To enable accumulation function, select parameter *FS ACC > ACC on*

- Place the goods on the platform to be weigh

Wait few seconds for display stable, then press . The value will be saved and printed (if the printer is connected).

Display will be appear
appear two seconds only.



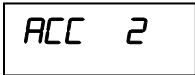
this display will

Remove the load and wait few seconds for display return to zero.

- Place the second goods on the platform.

Wait few seconds for display stable. Then press . The value will be saved.

Followed by the total number of weight will be displayed



It can continue the process until the maximum capacity or value.

Note: When you change the weighing unit this saved values will be clear.

Accumulated Total

Manually, the scale can be set to accumulation by pressing , when an optional printer is connected. See details in *F4 Prt*.

Memory Recall

When display of Zero, you can see the number of weighing and total weight by pressing , display will be shown for two seconds.

Memory Clear

When display of Zero, you can see the number of weighing and total weight by pressing , display will be shown for two seconds. Press  during this display. The memory data are deleted and display will be shown

ACC 0

5.10. Accumulation Automatically

In this function the individual weighing values are automatically added into the memory. No need to press any keys.

For this function, set to parameter *F4 Prt* and select *P AUTO*.

After select this function, display indicator AUTO will be shown.

- Place the goods on the platform to be weighed
After the stable, will be follow beep sound twice.
- Unload the goods, the weighing value will be saved automatically and will be follow beep sound once.

It can continue the process until the maximum capacity or value.

5.11. Animal Weighing

RW can use for vibrate loads.

For this function, set to parameter *P4 CHt* to *mode 2*

After select this function, display indicator ANIMAL will be shown.

- Bring the load on to 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.

5.12. Peak Hold

RW can operate peak hold function, maximum reading will be hold and will update automatically when adding the goods.

For this function, select parameter *P4 CH- to mode 4*

In the normal weighing mode press  and  keys together to turn on or turn off Peak hold operations,

5.13. Backlight Setting

In the weighing mode. Press  key and  key to select parameter F3 OFF >BL. press  key to select (BK AU/BK OFF/BK ON), After select the back light option press  key to confirm and press  key to escape from the settings.

5.14. Auto Power Off Setting

In the weighing mode. Press  key and  key to select parameter *F3 OFF >SEt OF*, press  key to change auto power off time: 0/3/5/15/30. (OF 0: always on, OF 33: auto power off after standby xx minutes), press  key to sure, press  key to escape.

5.15 subtraction scale

This is used for hopper scale, you need set auto zero range to 0 (see detail in section 6 and set scale mode to mode 3

Turn on power, scale will show "Err4", then show current total weight on

platform, press  key, display show 0.00, then remove goods in

hopper, display will show it's weight in "-" mode, press  key, scale will print out weighing ticket.

6. PARAMETERS

KEYS OPERATIONS INTO THE MENU

Enter the menu

- In weighing mode, press  key and  key together.

Select the menu

- Press , it can change the menu block one by one.
- Using increase the digit.

Enter the selected menu

- Press , it can confirm, which will be shown displayed.

Change the digit

- Press , it can change the active digit.

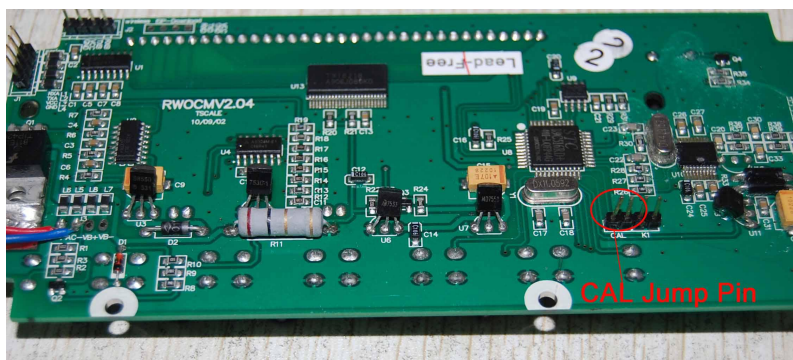
Return to weighing mode

- Press , exit from the menu.

Enter into Prog

When display shows *Prog*, press   and  keys to enter the function

Note: If want to change the settings *FS St*, *P1 SPed* and *P2 mode*
Before enter the parameters, should be short the Jump Pin CAL in the PCB



PARAMETER BLOCK

Menu	Sub-Menu	Description	
<i>F0 H-L</i> Weighing with set limits	<i>SEt Lo</i>	Lower limit value	
	<i>SEt Hi</i>	Upper limit value.	
<i>F1 totL</i>	<i>to CLr</i>	Clear the accumulation memory with out printout	
	<i>to P-C</i>	Print the total accumulation memory and clear the total memory	
	<i>to Prt</i>	Print the total accumulation and keep all the memory.	
<i>F2 Unt</i>	<i>G</i>	Weighing units	
<i>F3 oFF</i>	<i>bL</i>	<i>bL on</i>	Display of back light on
		<i>bL AU</i>	Display of back light on automatically
		<i>bL oFF</i>	Display of back light off
	<i>bEEP</i>	<i>bP 1</i>	Beep sound off during the check weighing
		<i>bP 2</i>	Beeper will be sounded within the check weighing limits
		<i>bP 3</i>	Beeper will be sounded above the check weighing limits
<i>F4 Prt</i>	RS 232 mode		
	<i>P Prt</i>	By pressing [M+] , weighing value will be added to the memory and print the print out	
	<i>P Cont</i>	Send data continuous	
	<i>SE irE</i>	Also send data continuous	
	<i>AST</i>	Bi- direction , through PC	

		Commands R= Send, T= Tare, Z= Zero
	<i>P Cnt 2</i>	No documented
	<i>P StAb</i>	Send data of stable weighing values
	<i>P AUto</i>	Automatic accumulation. Individual weighing values are automatically added
	Set BAUD rate After setting the RS 232 mode, display will be shown current baud rate <i>b XXX</i> . Available baud rate: <i>b600</i> , <i>b 1200</i> , <i>b2400</i> , <i>b4800</i> and <i>b9600</i> If necessary change the baud rate by pressing TARE and enter by pressing ZERO	
	Set print out format If enter settings <i>P Prt</i> , <i>P AUto</i> , <i>P Cnt</i> and connected optional printer	
	<i>Pr X</i>	M+ format- Date/Time
	<i>LAb X</i>	M+ format – Gross/Accumulation
	<i>Cnt 1</i>	Only for <i>P Cnt</i> only
	<i>Cnt 2</i>	N.A
	<i>Cnt 3</i>	
	Set printer type	
	<i>ty-tp</i>	Ticket printer
	<i>ty 711</i>	Label printer
	<i>LP 50</i>	Label printer
<i>FS S t</i>	<i>on</i>	Multi tare operation turn on
	<i>oFF</i>	Multi tare operation turn off
<i>Prog</i>	<i>P in</i>	Enter the programming and calibration menus by using password

PROGRAM PARAMETERS

P1 SPEd	SPd 7 5		To select A/D speed			
	SPd 15					
	SPd 30					
	SPd 60					
P2 nod	S, C rA	To select single range operation				
		dEC ,	To set decimal points. Options: 0 , 0 0 , 0 00 , 0 000 , 0 0000			
		inC	To set increment Options: 1 , 2 , 5 , 10 , 20 , 50			
		CAP	Set Capacity			
		CAL	Normal Calibration			
			Linear Calibration			
	dUAL rA	To select dual range Note: Once active second division (div 2), Then second division will work until display return to zero				
		dEC ,	To set decimal points. Options: 0 , 0 0 , 0 00 , 0 000 , 0 0000			
		inC	d , u 1	To select first division Options: 1 , 2 , 5 , 10 , 20 , 50		
			d , u 2	To select second division Options: 1 , 2 , 5 , 10 , 20 , 50		
			CAP	CAP 1	To select first capacity	
				CAP 2	To select second capacity	
		CAL	Normal Calibration			
			Linear Calibration			
		dUAL	To select dual interval Note: First interval will active in CAP 1 Second interval will active in CAP 2			
			dEC ,	To set decimal points		
			d , u 1	To select first division		

	in	inC		Options: 1, 2, 5, 10, 20, 50
			d i v 2	To select second division Options: 1, 2, 5, 10, 20, 50
		CAP	CAP 1	To select first capacity
			CAP 2	To select second capacity
		CAL	Normal Calibration	
			Linear Calibration	
P3 Pro	CoUnt		This display will show XXXXX for indicating the internal counts.	
	rESEt		Factory default settings	
	GrA		Set the local gravity	
P4 CHt	modE 1		Normal weighing mode. (check weighing, accumulation)	
	modE 2		Animal weighing mode. (scale will lock reading unstable loads, when display get little stable)	
	modE 3		This is a subtraction scale (print out “-” weight)	
	modE 4		Peak Hold mode. (Scale can hold maximum reading)	

7. CALIBRATION

- In weighing mode, press  key and  key together. *Fo H-L*
- Press  continuous until display will be shown. *ProG*
- Press  , display will be shown. *P in*
- Enter the password. Press ,  and  Display will be shown *P 1 SPed*
- Press  , display will be shown. *P 2 CAL*
- Enter the function by pressing  , display will be shown *dEC*
- Press  continuous until display will be shown. *CAL*
- Enter the function by pressing  , display will be shown *L inEAR*
- Press  to select for normal calibration *nonL in*

Normal Calibration:

nonL in

- Enter the function by pressing  , display will be shown *UnLoAd*
- Make sure there are no loads on the platform and wait few seconds for stable indicator on.

- Enter the function by pressing  , display will be shown
Currently adjustment 05 000

- If want to change by using the keys  ,  ,  to select the required setting

- Enter the selected setting by pressing  , display will be shown. LoAd

- Load the calibration mass weight on the platform and wait few seconds for display stability.

- After the stable indicator on press  , display will be shown. PASS

After the calibration the display will start a self test. Remove the load from platform during the test. Display will come to weighing mode automatically.

If display will be shown any error or incorrect value, repeat the procedure again.

Linear Calibration

L inERr

The linearity deviation caused by the performance of the weighing unit. The digital linearization function can reduce the linearity deviation using weighing points during the zero and capacity. Up to three weighing points can be specified.

L inERr

- Enter the function by pressing  , display will be shown LoAd 0
- Make sure there are no loads on the platform and wait few seconds for stable indicator on.
- Enter the function by pressing  , display will be shown LoAd 1

- Load the first calibration mass weight on the platform (mass weight should be $1/3$ of the max capacity) and wait few seconds for display stability.

- Then press  , display will be shown

LoAd 2

- Load the second calibration mass weight on the platform (mass weight should be $2/3$ of the max capacity) and wait few seconds for display stability.

- Then press  , display will be shown

LoAd 3

- Load the third calibration mass weight on the platform (mass weight should be $3/3$ of the max capacity) and wait few seconds for display stability.

- Then press  , display will be shown

PASS

After the calibration the display will start a self test. Remove the load from platform during the test. Display will come to weighing mode automatically.

8. RS-232 OUTPUT

ROW series balance can take out data through RS 232 output.

Specifications:

RS-232 output of weighing data

Code : ASCII

Data bits : 8 data bits

Parity : No Parity

Baud rate : 600bps to 9600bps selectable

RS-232 (9pin connector)

Pin 2	RXD	Input	Receiving data
Pin 3	TXD	Output	Transmission data
Pin 5	GND	—	Signal ground

9pin D Connector:

Indicator

Pin 2:

Pin 3:

Pin 5:

Computer / Printer

Pin 3

Pin 2

Pin 5

Note: If data not getting in to PC, want to inter-change the Pin 2 and Pin 3 connections from one of the connector.

Continuously output protocol

Weighing Mode;

		,		-/□								k	g	CR	LF
HEADER1		HEADER2		WEIGHT DATA								WEIGHT UNIT		TERMINATOR	

HEADER1: ST=STABLE, US=UNSTABLE

HEADER2: NT=NET, GS=GROSS

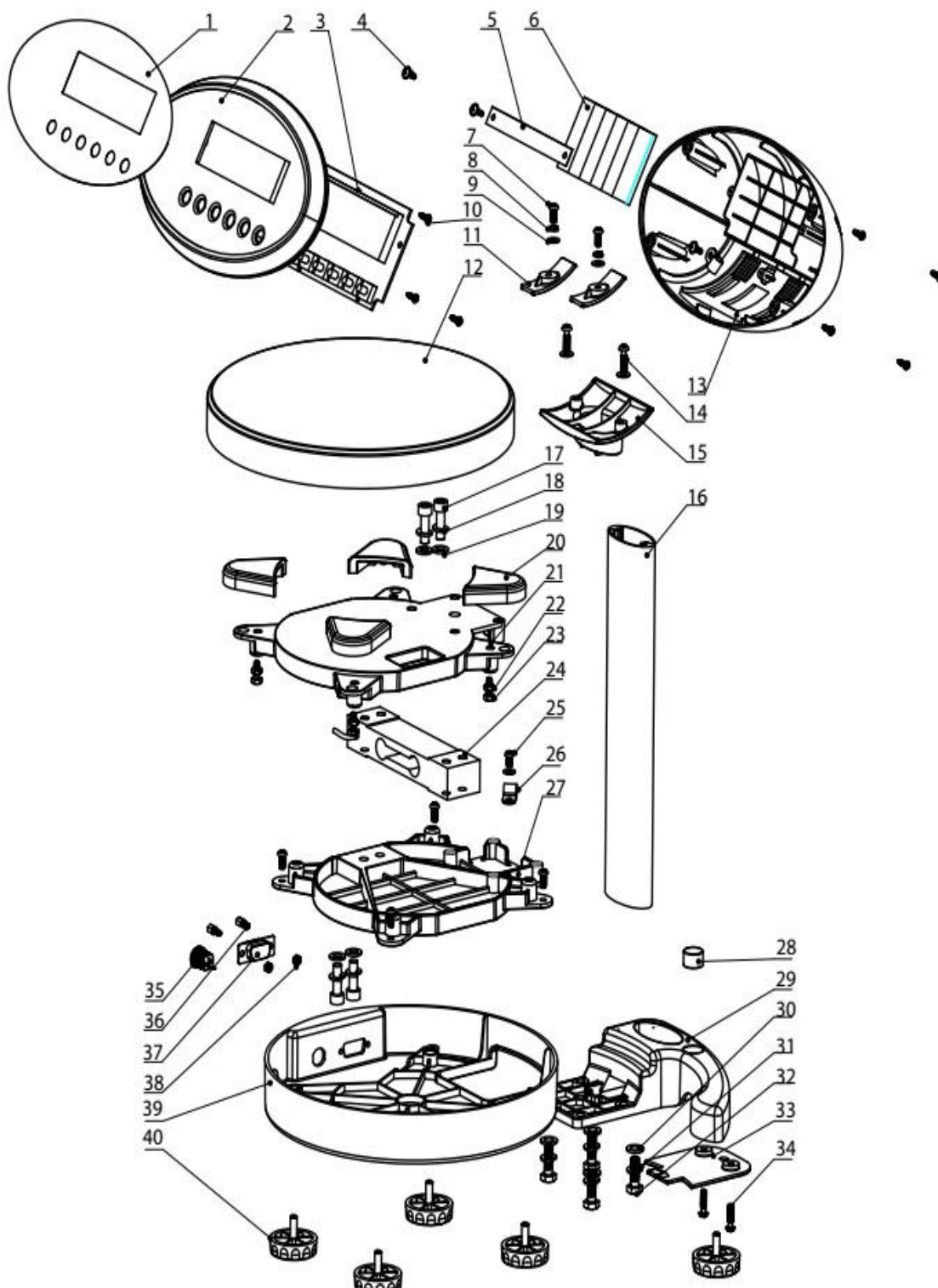
Print Out Formats

Note: Lab 0 & 2 for English and Lab 1 & 3 for Chinese Language

Lab Pr	0	1	2	3
0	2016/09/16 11:11 WEIGHT: 1.00kg		WEIGHT: 1.00kg	
1	2016/09/16 11:11 WEIGHT: 1.00kg TOTAL: 1.00kg		WEIGHT: 1.00kg TOTAL: 1.00kg	
2	2016/09/16 11:11 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg		NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg	
3	2016/09/16 11:11 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg TOTAL: 10.00kg		NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg TOTAL: 10.00kg	
4	2016/09/16 11:11 S/NO: 10 WEIGHT: 1.00kg		S/NO: 10 WEIGHT: 1.00kg	
5	2016/09/16 11:11 S/NO: 10 WEIGHT: 1.00kg TOTAL: 10.00kg		S/NO: 10 WEIGHT: 1.00kg TOTAL: 10.00kg	

<p>6</p>	<p>2016/09/16 11:11</p> <p>S/NO: 10 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg</p>		<p>S/NO: 10 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg</p>	
<p>7</p>	<p>2016/09/16 11:11</p> <p>S/NO: 10 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg TOTAL: 10.00kg</p>		<p>S/NO: 10 NET: 1.00kg GROSS: 1.00kg TARE: 0.00kg TOTAL: 10.00kg</p>	

9. DRAWING



40	NB Foot	5	PP+ Carbon Steel	Gray
39	ROW-Frame housing	1	ABS	
38	D Type nut M2.5	2		
37	DB9 Socket -95	1		
36	D Type Screw M2.5	2		
35	Adaptor Jack - Round	1		
34	M4x16 Round Head Screw	2	SS	
33	Rod Holder Cover	1	ABS	
32	M6*20 Hex Screw	4	SS	
31	M6 Spring Washer	4	SS	
30	Flat Washer $\phi 6$	4		
29	Rod-Holder	1	AL	
28	Level Bubble $\phi 14.7$	1		
27	Pan Recepticle Bottom	1	AL	
26	Cable tie	2	PVC	
25	M4x8 Round Head Screw	1		F
24	Load Cell	1	AL	X6-10KG-0.85m
23	M4*12 Hex Screw	4		Over load Protection
22	M4 Nut	4		Over load Protection
21	Pan Recepticle	1	AL	
20	Bush -Pan	4	NBR	Pan Support
19	$\phi 6$ Flat Washer	4		
18	M6 Spring Washer	4	65Mn	Load Cell Secure
17	M6x20 Allen Screw	4		
16	Pole- Aluminum	1	AL	
15	ROW- Head Folder	1	ABS	
14	M4x16 Star Screw	2		
13	Indicator Rear Cover	1	ABS	
12	ROW- Pan	1	SUS304	
11	ROW-Transfer Layer	2		
10	M3x8 Star- Screw	8		Self Thread
9	$\phi 4$ Flat Gasket	5		
8	M4 Spring Washer	2	65Mn	
7	M4x10 Head Screws	6		
6	Battery	1	Ni-MH	7.2V/2000mAH
5	Battery Clamp	1	PVC	
4	M3x8 Self Thread Screw	3		
3	PCB	1		
2	Indicator Front Cover	1	ABS	
1	Overlay	1		
S.No	Name	Pcs	Materials	Remarks

10. ERROR CODES

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 7</i>	Percentage Error	Please check input data, must be > 0.5d
<i>Err 8</i>	Calibration weight error	Check the test weights for calibration or linear calibration
<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 10</i>	Wireless communication failure	Check wireless settings or change Com settings from the wireless
<i>Err 11</i>	Communication protocol error	Check communication settings
<i>Err 12</i>	Accumulation error	Max accumulation times 99 / 999 / weight 999999
<i>Err 13</i>	Lack of unit weight	Check unit weight entry data, must be >0.5d
<i>Err 14</i>	Lack of sample	Check counting samples entry, must be >20d
<i>Err 15</i>	Gravity error	Check the gravity settings. Gravity range must be 0.9xx ~ 1.0xx
<i>Err 16</i>	Paper error	Check the printer paper
<i>Err 17</i>	Tare out of range	Minus weight or overload. Remove the load and restart

		scale again.
<i>Err IB</i>	Pre-tare error	Check the pre-tare value
<i>Err 19</i>	Initialize zero error	Calibration the scale.
<i>Err P</i>	Printer error	Check the printer settings or connections
<i>Err L</i>	Approval setting error	Check the PCB jumper settings. Must be connect jumper pin to K1 (BW series)
<i>--oL--</i>	Over range	Remove the load. Re calibrate
<i>--Lo--</i>	Underload	Minus weight, check the platform and restart or calibrate.
<i>FA, L H / FA, L L / FA, L</i>	Calibration Error	Check the test weights & Re calibrate
<i>bA Lo / Lo bA</i>	Battery low	Re charge battery, check the voltages.