T-Scale

Technical Manual

ROW

Precision Balance

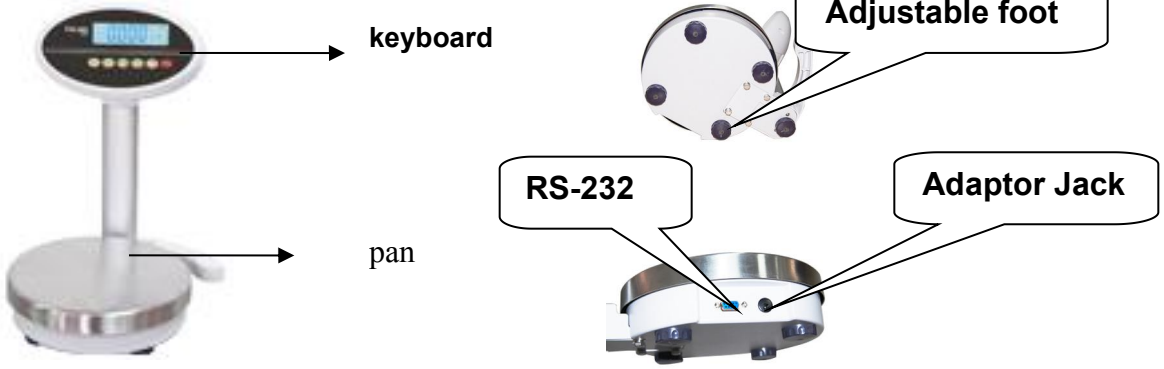
V1.20-V1.10

REV:YM1,OCT 2016

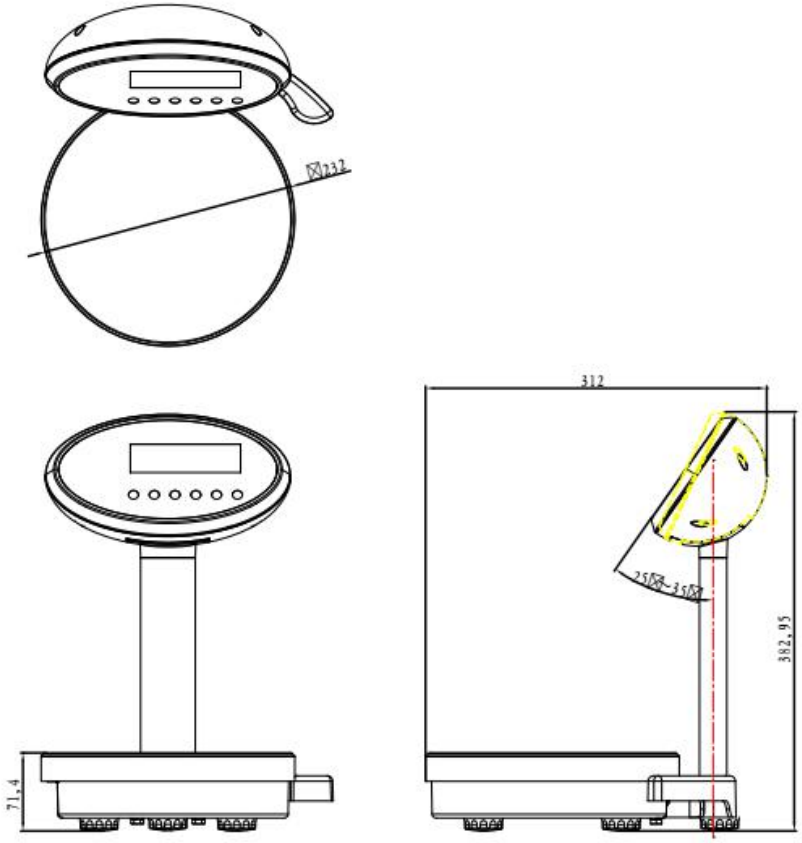
CONTENTS

1. SPECIFICATIONS

Overall View



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 are 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 plat form load cell cable in to the indicator load cell connecter. Load cell connecter is locating back side of the balance.
- Connect the adaptor pin in to the indicator adaptor jack.
  Adaptor jack is locating, 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 be show 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

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 

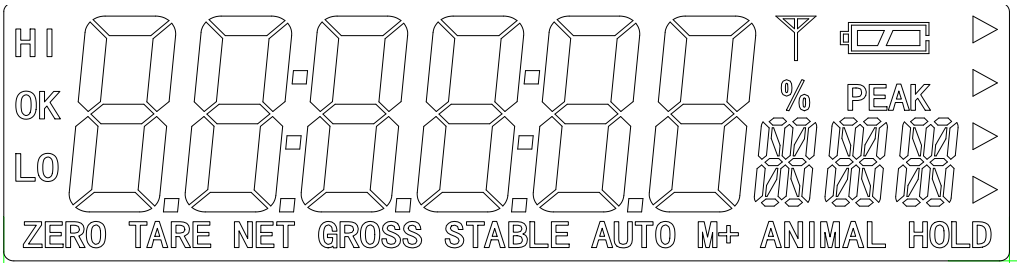
  Fully charged 

  .
- 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.

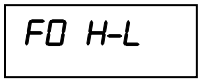
- **Check mode 1**: No beep sound in the limits. Function turned off.
- **Check mode 2:** When the weight is between the limits. OK will shown and beeper will be sounded.
- **Check mode 3:** When the weight is out of the limits, **t**he beeper will be sounded and OK will shown.

5.6. Enter to Menu

In the weighing mode, press 

and 

together.

Display will be appear 

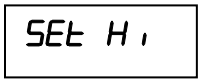
5.7. Set limits

Press 

to enter the function.

Press 

key to select the limit.

Display will appear 

or 

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 

Press 

key to enter, press 

until display show 

Press ZERO key to enter, press

Check mode 1 bP 1

Check mode 2 bP 2

Check mode 3 bP 3

Select desired setting by pressing TARE and press ZERO key to confirm, press UNIT 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 M+. The value will be saved and printed (if the printer is connected).

  Display will be appear ACC 1 this display will appear two seconds only.

  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 M+. The value will be saved.

  Followed by the total number of weight will be displayed ACC 2

  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 ānodE 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 CHK 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.

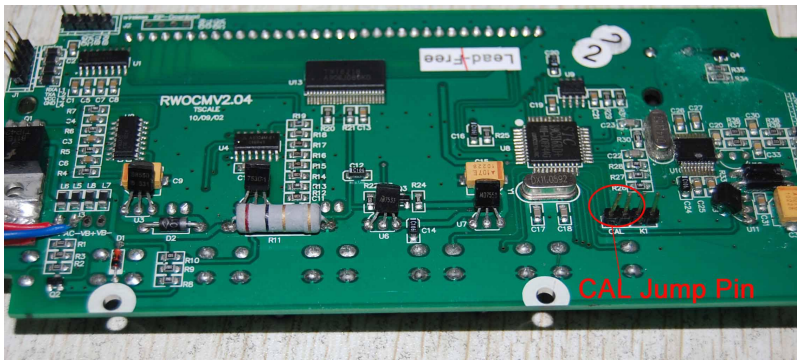
Enter into Prog

When display shows PrOG , press 

and 

keys to enter the function

Note: If want to change the settings FS SE , 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	
F0 H-L Weighing with set limits	SEt Lo	Lower limit value	
	SEt H ı	Upper limit value.	
F 1 toL	to CLr	Clear the accumulation memory with out printout	
	to P-C	Print the total accumulation memory and clear the total memory	
	to Prt	Print the total accumulation and keep all the memory.	
F2 Unt	G	Weighing units	
F3 oFF	bL	bt on	Display of back light on
		bt AU	Display of back light on automatically
		bt oFF	Display of back light off
	bEEP	bP 1	Beep sound off during the check weighing
		bP 2	Beeper will be sounded within the check weighing limits
		bP 3	Beeper will be sounded above the check weighing limits
F4 Prt	**RS 232 mode**		
	P Prt	By pressing **M+** , weighing value will be added to the memory and print the print out	
	P Cont	Send data continuous	
	SE irE	Also send data continuous	
	ASt	Bi- direction , through PC	

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

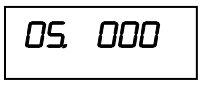
- In weighing mode, press UNIT key and M+ key together. | Fo H-L
- Press TARE continuous until display will be shown. | ProG
- Press ZERO , display will be shown. | P in
- Enter the password. Press G/N , UNIT and ZERO Display will be shown | P 1 SPEd
- Press TARE , display will be shown. | P 2 CAL
- Enter the function by pressing ZERO , display will be shown | dEC
- Press TARE continuous until display will be shown. | CAL
- Enter the function by pressing ZERO , display will be shown | L inEAr
- Press TARE to select for normal calibration | nonL in

Normal Calibration: nonL in

- Enter the function by pressing ZERO , 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



- If want to change by using the keys 

, 

, 

to select the required setting

- Enter the selected setting by pressing 

, display will be shown.

- 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.

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

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.

- Enter the function by pressing 

, display will be shown

- Make sure there are no loads on the platform and wait few seconds for stable indicator on.

- Enter the function by pressing 

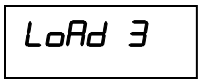
, display will be shown

- Load the first calibration mass weight on the platform (mass weight should be1/3 of the max capacity) and wait few seconds for display stability.
- Then press 

, display will be shown

- Load the second calibration mass weight on the platform (mass weight should be2/3 of the max capacity) and wait few seconds for display stability.
- Then press 

,display will be shown



- Load the third calibration mass weight on the platform (mass weight should be3/3 of the max capacity) and wait few seconds for display stability.
- Then press 

,display will be shown

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 Connecter:

Indicator	**Computer / Printer**
Pin 2:	Pin 3
Pin 3:	Pin 2
Pin 5:	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 connecter.

Continuously output protocol

Weighing Mode;

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

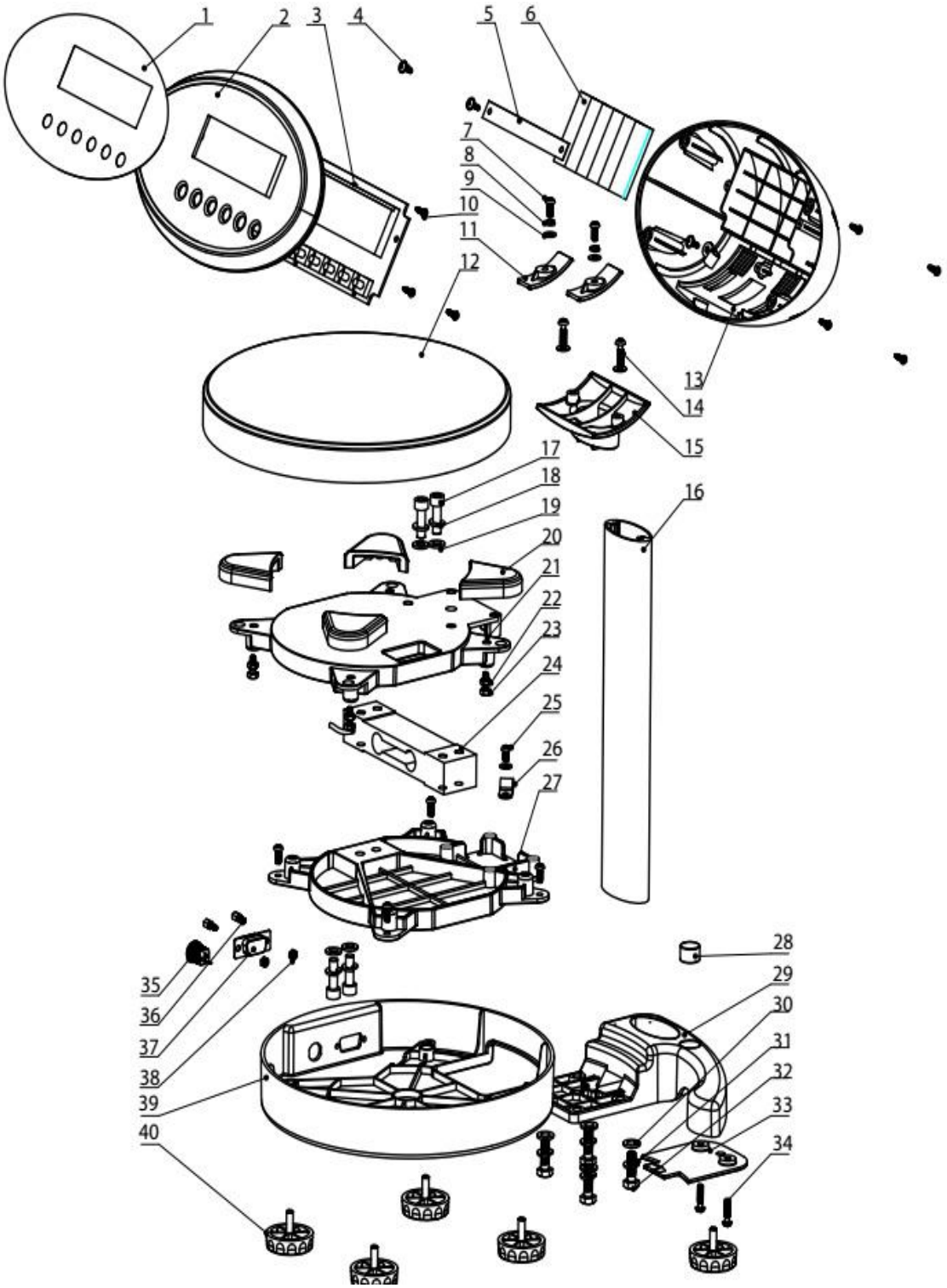
Print Out Formats

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	

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

9. DRAWING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S.No	Name	Pcs	Materials	Remarks
40	NB Foot	5	PP+ Carbon Steel	Gray
39	ROW-Frame housing	1	ABS	
38	D Type nut M2.5	2		
37	DB9 Socket -9S	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 φ6	4		
29	Rod-Holder	1	AL	
28	Level Bubble φ14.7	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 Receipticle	1	AL	
20	Bush -Pan	4	NBR	Pan Support
19	φ6 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	φ4 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		

10. ERROR CODES

Error Message	Description	Solution
-----	Maximum load exceeded	Unload or reduce weight
Err 1	Incorrect date	Enter the date by using format “yy;mm:dd”
Err 2	Incorrect time	Enter the time by using format “hh:mm:ss”
Err 4	Zero setting error	Zero setting range exceeded due to switching on.(4%max) Make sure platform empty.
Err 5	Key board error	Check the keys and connecter.
Err 6	A/D value out of range	Make sure platform empty and check the pan is installed proper. Check the load cell connectors.
Err 7	Percentage Error	Please check input data, must be > 0.5d
Err 8	Calibration weight error	Check the test weights for calibration or linear calibration
Err 9	Unstable Reading	Check any air variation, vibration, RF noise and touching some where. Check the load cell and connecters.
Err 10	Wireless communiation failure	Check wireless settings or change Com settings from the wireless
Err 11	Communication protocol error	Check communication settings
Err 12	Accumulation error	Max accumulation times 99 / 999 / weight 999999
Err 13	Lack of unit weight	Check unit weight entry data, must be >0.5d
Err 14	Lack of sample	Check counting samples entry, must be >20d
Err 15	Gravity error	Check the gravity settings. Gravity range must be 0.9xx ~ 1.0xx
Err 16	Paper error	Check the printer paper
Err 17	Tare out of range	Minus weight or overload. Remove the load and restart

		scale again.
Err 18	Pre-tare error	Check the pre-tare value
Err 19	Initialize zero error	Calibration the scale.
Err P	Printer error	Check the printer settings or connections
Err L	Approval setting error	Check the PCB jumper settings. Must be connect jumper pin to K1 (BW series)
--oL--	Over range	Remove the load. Re calibrate
--Lo--	Underload	Minus weight, check the platform and restart or calibrate.
FAiL H / FAiL L / FAiL	Calibration Error	Check the test weights & Re calibrate
bA Lo / Lo bA	Battery low	Re charge battery, check the voltages.

The company was founded in Taiwan in 1967 as Taiwan Scale Mfg Co., Ltd in order to produce Mechanical Weighing Instrument. Today, this privately owned company is recognized worldwide as a leading Electronic Weighing Scale Manufacturer. The core business of TSCALE is the development, manufacture, worldwide sales/marketing and service of electronic weighing instruments.

The TSCALE products

- Medical Scale
- Counting Scale
- Tabletop Scale
- Retail Scale
- Precision Scale
- Pallet Scale
- Weighing Indicator
- Crane Scale
- Floor and Pallet Scale
- Accessory
- Software

TSCALE has its manufacturing unit in Kunshan, China, ISO 9001 certified company, **OEM/ODM** partner,more than 20 products have **OIML** certifications from Holland's NMI and Denmark's Delta.

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