T-Scale

Technical Manual

NB-NHB Series

Precision Balance

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1. PRECAUTIONS

⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.

⚠ CAUTION

- **Permit only qualified persons to service the instrument**
- **Before connecting or disconnecting any components, remove the power.**
- **Failure to observe these precautions bodily harm or damage to or destruction of the equipment.**

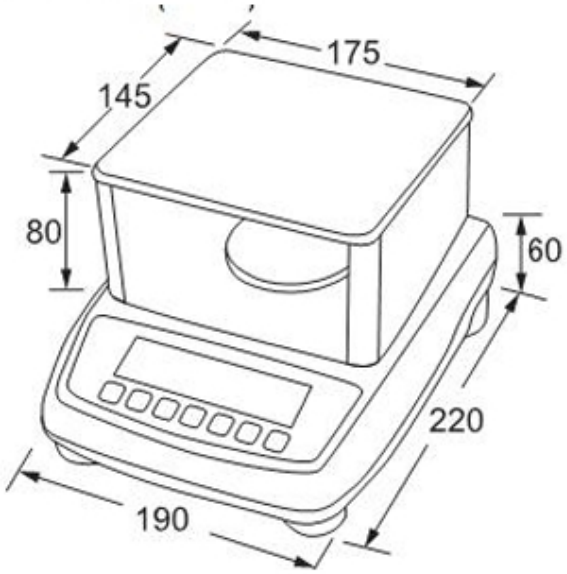
- The weighing scale is a precision electronic instrument, handle it carefully.
- Do not install the scale in direct sunlight.
- Verify the local voltage and receptacle type are correct for the scale.
- Only use original adaptor, other could cause damage to the scale.
- Pluggable equipment must be installed 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 scale clean

2. INTRODUCTION

- The NB/NHB series balance, that amplifies signals from a load cell, converts it to digital data and displays it as a mass value.
- It is accurate, fast and versatile series of general purpose balances with counting, % weighing functions and accumulation
- 16.5 mm LCD with white LED back light display
- All the keypads are light touch switches
- Battery provide up to 90 hours of continues use (with out backlight)
- Capacity 60g to 6000g.
- All units include automatic zero tracking, automatic tare, and an accumulation facility that allows the count to be stored and recalled as an accumulated total

3. SPECIFICATION

3.1 Dimension



3.2 Specifications

NHB SERIES Class II						
Model #	**NHB-150**	**NHB-300**	**NHB-600**	**NHB-1500**	**NHB-3000**	**NHB-6000**
Maximum Capacity	150g	300g	600g	1500g	3000g	6000g
Readability(d)	0.002g	0.005g	0.01g	0.02g	0.05g	0.1g
Readability(e)	0.02g	0.05g	0.1g	0.2g	0.5g	1g
Resolution	1/7,500	1/6,000	1/6,000	1/7,500	1/6,000	1/6,000
Tare range	-149.998g	-299.995g	-599.99g	-1499.98g	-2999.95g	-5999.9g
Minimum Capacity	1g	2.5g	5g	10g	25g	50g
Linearity ±	0.004g	0.01g	0.02g	0.04g	0.1g	0.2g
Platter	Φ80mm	Φ120mm		140x150mm		
Wind shield	Yes			None		
Units of Measure	g / .g / ct					

Common Specifications	
Interface	RS-232 Output Optional
Stabilisation Time	2 Seconds typical
Operating Temperature	+5°C - 40°C / 41°F - 104°F
Power supply (external)	12V/500mA or built-in rechargeable battery 6V/1.2Ah
Calibration	Automatic External
ADC	Σ-Δ
Display	16.5 mm high 6 digits LCD with auto backlight and loading bar graph
Balance Housing	ABS Plastic, Stainless Steel platform
Pan Size	Φ80mm / Φ120mm / 140×150mm
Overall Dimensions (wxdxh)	190mm x 220mm x 60mm
Other Features and Specs	Accuracy enhancement for parts counting and percentage weight function

3.3 Load Cell Specifications

Model No	**SPL**
Rated Capacity	300/ 600 / 1500 / 3000 gm
Sensitivity	0.8 ~ 1.0 mv/v
Excitation Voltage	15V
Material	Aluminum
Cable	0.3~3m Φ 4mm
Input Resistance	420Ω ±20Ω
Out put Resistance	350Ω ±5Ω
Temperature Range	-30°C ~ +70°C
Safe overload	150%F.S
Ultimate overload	300%F.S
Error	±0.0233%F.S
Creep (20min)	±0.020%F.S
Zero Balance	0±5%mV/V
Max. Platform Size	200x200mm

4. INSTALLATION

Unpacking

Carefully take the balance out of its package, make it sure its not damaged and all accessories are included.

- Remove the weighing scale from the carton.
- Remove the protective covering. Store the packaging and to use if you need to transport the scale later.
- Inspect the scale and terminal for damage.
- Make sure all components are included

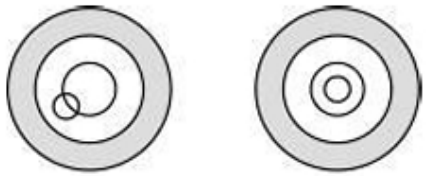
Accessories,

1. Balance
2. Adaptor
3. Pan
4. Product manual

Level Adjusting

Place the scale on a table.

Check the water mark. If, bubble is not centre adjust the leveling feet until reach centre. Check the level when you change the location.

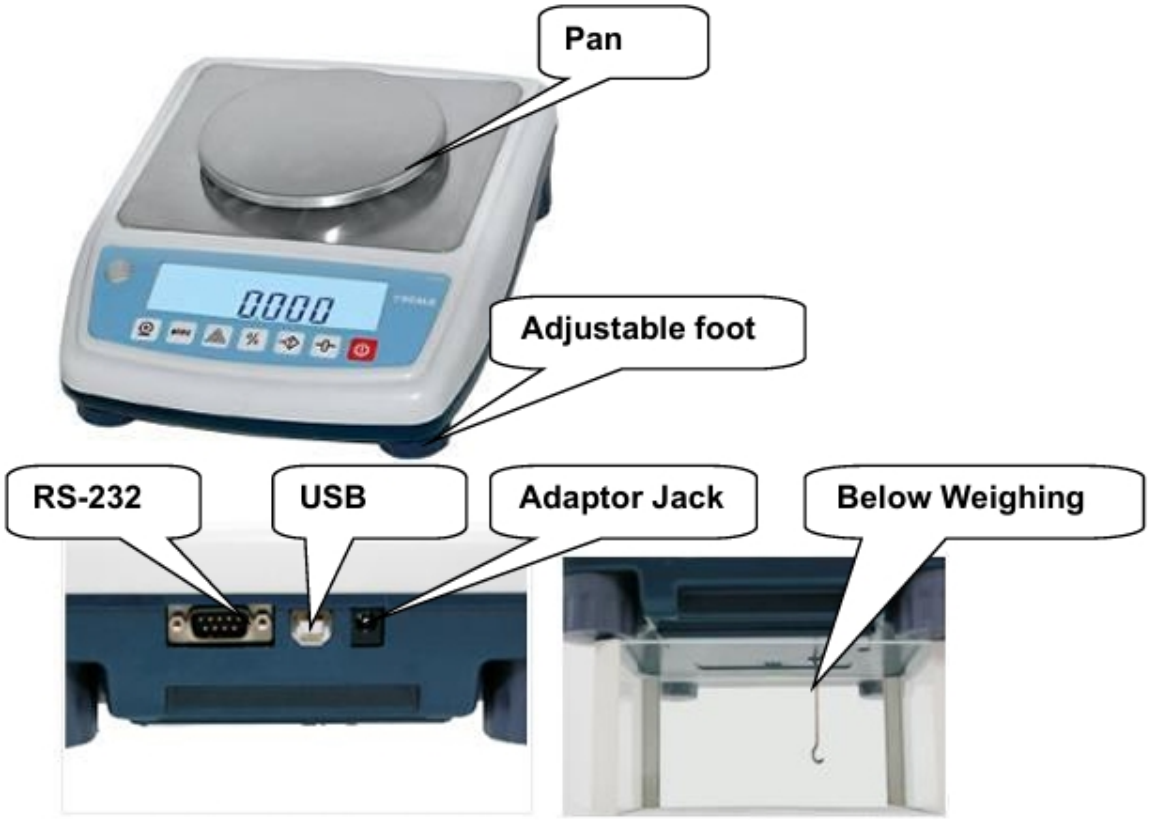


Charging Battery

- To charge the battery insert the adaptor pin to jack, jack is locating rear side of the scale. 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.
- In the LCD display has an battery indicator to indicate the status of battery charging, When the scale is plugged into the mains power the internal battery will be recharged. When turn on the indicator ,if the battery indicator is full then the battery has a full charge. If it is half then the battery is nearly discharged and empty indicates the battery should be 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

Installation

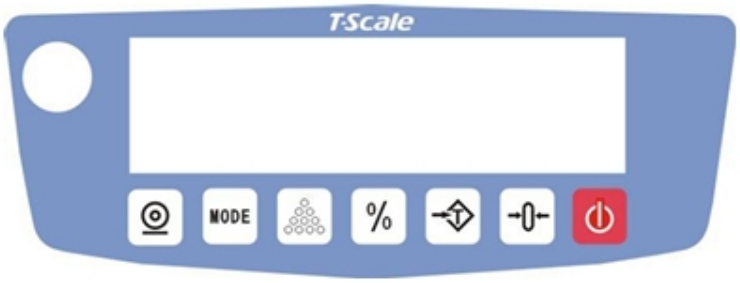


- Place the scale on a table..
- Connect the adaptor pin in to the scale adaptor jack. Adaptor jack is locating, rear side of the scale.
- Adaptor connects into your AC power socket. Pluggable equipment must be installed near an easily accessible socket outlet with a protective ground/ earth contact.
- Turn on the On/Off key. If you want to turn off, press the key again.
- Display will be show the version number 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

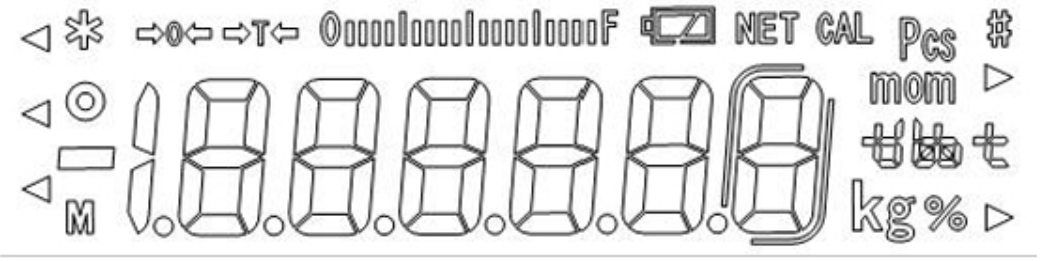
5. DESCRIPTION

Key Board



	Turns the scale power On / Off
	Sets display to Zero
	Subtracts weight of container
	Set percentage weighing function
	Set to counting mode
	Set to weighing units
	Set to print the results

Display



DISPLAY	FUNCTION
⇨0⇦	Indicator for Zero display
⇨T⇦	Indicator for Tare display
0 F	Indicator for weighing capacity graph
NET	Indicator for Net weight
◎	Indicator for Display stability
Pcs	Indicator for piece counting
mom kg t	Indicator for units
%	Indicator for Percent weighing
	Indicator for Charging status of battery Voltage has dropped
	Low Voltage
	Fully Charged

6. OPERATION

Initial Start-up

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

6.1 Power ON/OFF

Switch on the scale by pressing . The display is switched on and the self test is started.
If you want to switch off press the key again.

6.2 Zero

Environmental conditions can lead to the balance exactly zero in spite of the pan 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.

6.3 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 pan.
- Press key. Zero is displayed, and tare is subtracted.
- Remove weight from the platform. Tared weight is displayed. It can set only one tare value. It can display with a minus value.
- Press key. Zero is displayed, tare weight is cleared.

6.4 Weighing Unit

Press

key in the weighing mode to change the Weighing unit: g / ct

6.5 Percent Weighing

The scale can set a sample weight to be shown as 100%. Then any other weights place on the scale, it will be displayed as a percentage of the original sample.

For example:

- 350g weight place on the scale and follow by press the [%] key is pressed the display will show 100.00%.
- Remove the weight, and ensure display is zero
- Place 300g weight on the platform, display will be show 85.71 % as per the percentage of 350g (100%)
- The weighing may be amended on the basis of greater numbers of samples, improves the accuracy of percentage large quantities.

6.6 Parts Counting

Parts Counting

Press [▲] key enter the parts counting mode and select the counting options by pressing [MODE].
Display will be shown

SP 10	For 10 pieces
SP 20	For 20 pieces
SP 50	For 50 pieces
SP 100	For 100 pieces
SP 200	For 200 pieces

Select the counting option and press [→0←] to confirm.
Then can add more weight display will be show the number of parts.

<u>Parts Counting Operation</u>

If necessary place a container on the platform and press [→T←] to make zero.

- Select the parts quantity as per the option
- Place the load on the platform
- Press [→0←] 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.

6.7 Accumulation

The scale can be set to accumulate manually by pressing key.
Before operation scale should be stable and return to zero, accumulation available only when weight more than 20d
To enable accumulation function, select parameter SALE n> SALE n

Accumulation Operation

- Place the load on the platform.
- Press key, when displayed STABLE indication.
- Display will be show
  then will be show the total saved value. These displays will be shown only three seconds. If the optional RS-232 interface is installed the weight data will be send to printer.
- 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.

6.7.1 Memory Recall

To recall the memory press key.

Display will be show

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

6.7.2. Memory Clear

To clear the memory, press key to view and press **key** during the accumulation displayed. Display will be show normal display , all accumulation memory cleared from the memory

6.7.3automatically accumulate

To enable accumulation automatically function, to select parameter F3 Con > P AUto, press →0← key to confirm, you need set baud rate and printer type, language, press ◎ key to escape

Operation

- Place the load on the platform.
- after stable, you will hear beep on twice.
- add or remote weight , scale will beep on again after stable
- Remove the weight from the pan.
- Press ◎ key , the total saved value will be show only three seconds

6.8 Set Backlight

- Press MODE key during self checking to select parameter F2 bL ,press MODE key to select (EL AUI EL oFFI EL on),press →0← key to confirm

7. PARAMETERS

Enter the Menu

- Turn on the scale. Press MODE during that start up until display will be shown F1 Unt

Choose the Menu

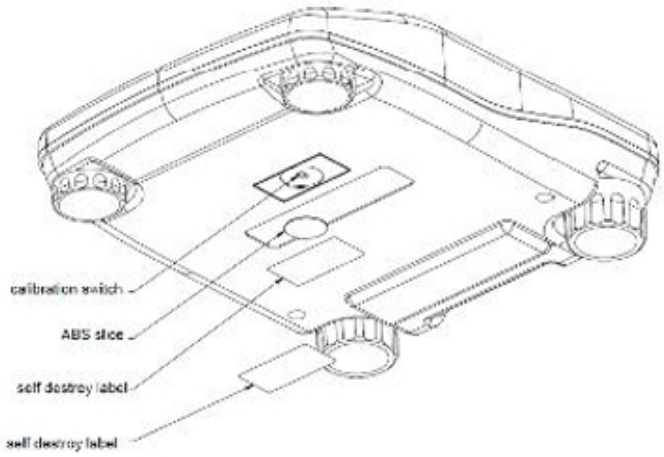
- Press MODE, it can choose menu block or options one by one.

Enter the Selected Menu

- Press →0←, it can confirm which will be shown displayed.

Enter in to TECH

Note: Before enter the tech menu, press calibration switch, which is locating below the scale



- When display showed P1n, press ▲ ◎ and → keys to enter the function

Escape from the Menu

- Press ◎ key, it can escape from the menu to weighing mode.

Menu	Sub Menu	Description
F 1 Unt	N.A	
F 2 bL	EL AU	To set back light automatic on
	EL on	To set back light always on
	EL oFF	To set back light always off
F3 Con	S 232 / S USb	Select first RS 232 or USB
	P Prt	By pressing Print key , weighing value will be added to the memory and print the print out
	P Cont	Send data continuous
	P AUto	Automatic accumulation. Individual weighing values are automatically added
	P ASt	ASK mode Command R: read data Command T: Tare Command Z: Zero
	U irELE	Wireless (optional)
	Set BAUD rate After setting the RS 232 mode, display will be shown current baud rate b **XXX**. Baud rate Options: b600, b 1200, b2400, b4800 and b9600	
	Set Printer type After setting BAUD rate display will be show the printer type(only for P Prt and P AUto option)	
	LP 50	Label Printer
	tP	Ticket Printer
	Set Printer type After setting BAUD rate display will be show the printer type	
	LP 50	Label Printer
	tP	Ticket Printer
SALE n	SALE n	Accumulation function enable;units change enable
	SALE y	Accumulation function disable;units change disable
tECH	P in	Enter the password
P 1 L in		Linear Calibration
P 2 CAL		Normal Calibration

P 3 CnE	xxxx		This display will show XXXXX for indicating the internal counts
P 4 A 2n	N.A		
P 5 GrA	XXXXX		To set local gravity
P6 CAP	60G / 150G / 300G / 600G / 1500G / 3000 G / 6000 G		To set Capacity
P7 SPd	SPd L	Speed low	To set AD speed
	SPd n	Speed medium	
	SPd H	Speed high	
P8 S-t	St oFF		Multi tare operation turn off
	St on		Multi tare operation turn on

8. CALIBRATION

- Turn on the scale.
- Press [MODE] key during self checking, display will be show F 1 Unt
- Press [MODE] key until display will be show tECH
- **Note: Before enter the tech menu, press calibration switch, which is locating below the scale**
- Press [▲] [◎] and [→0←] keys, display will be show P 1 L in

8.1. Linear Calibration L i nEAr

- Press [→0←] key to enter calibration, display will be shown P i n
- Press [◎] [▲] and [%] keys, display will be
- Display will be shown LoAd 0
- Ensure the platform is empty
- After stable and zero indicator on, display will be shown L oAd 1
- Place the calibration weight (1/3 of the capacity) on the platform.
- After stable and zero indicator on, display will be shown L oAd 2
- Place the calibration weight (2/3 of the capacity) on the platform.
- After stable and zero indicator on, display will be shown L oAd3
- Place the calibration weight (full of the capacity) on the platform.
- After stable and zero indicator on, display will be will be start self checking. After self checking display will come to normal weighing mode

8.2. Normal calibration P2 CAL

- Press [→0←] key to enter calibration, display will be show UnLoAd
- Remove all the weight from the platform.
- When scale get stable, display will be show LoAd
- Place the calibration weight (1/3 of the capacity or full of the capacity) on the platform
- After stable, scale will be calibrate automatically and will start self-test.

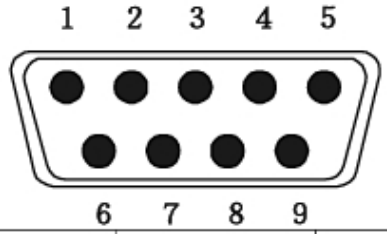
Note: Incase display will show any error message or incorrect measurement, repeat the calibration again.

9. RS-232 OUTPUT

1. Specifications:

RS-232 output of weighing data
ASCII code
600~9600 Baud
8 data bits
No Parity

2. RS-232 (9pin D type connector)



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

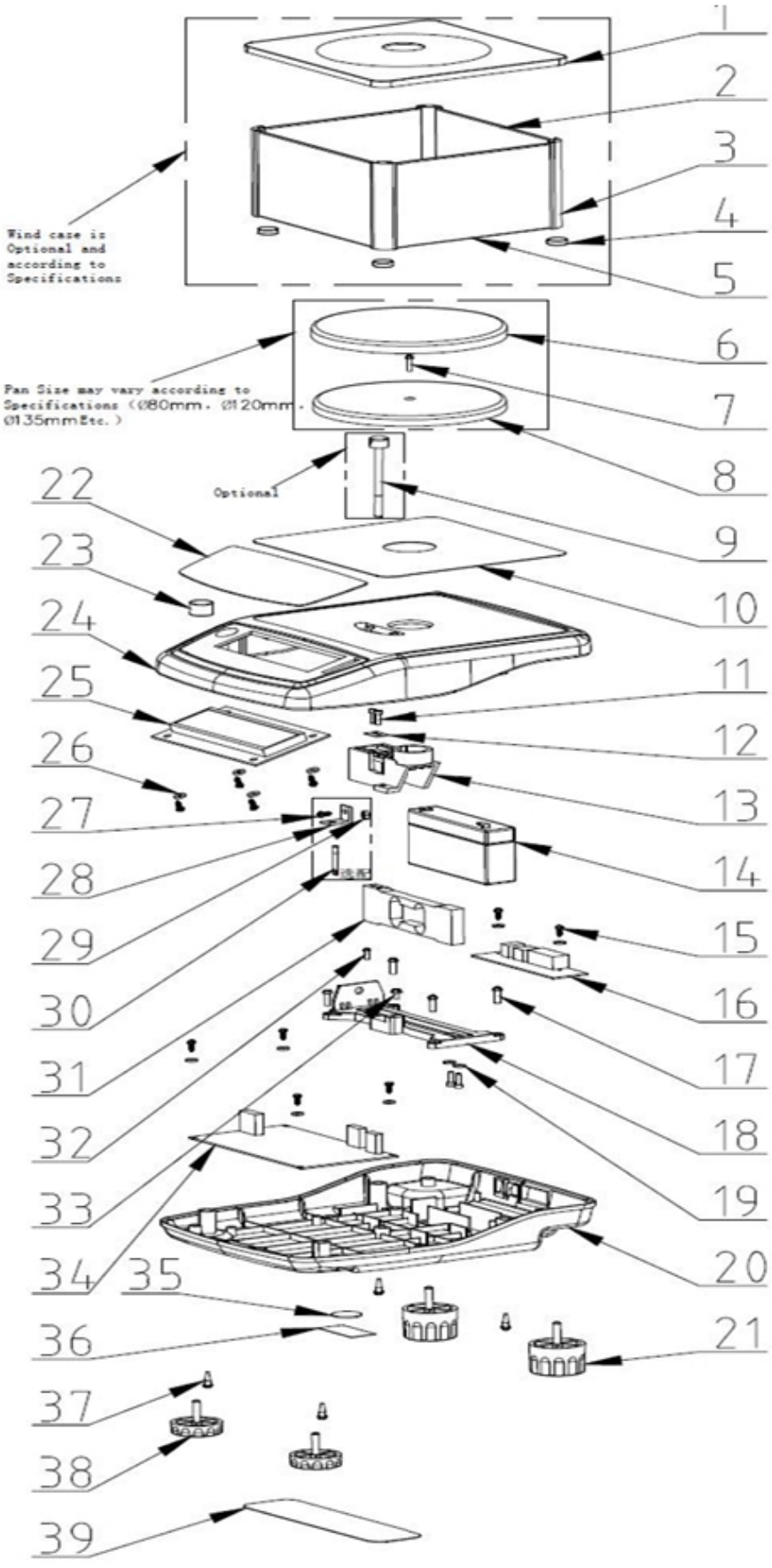
9pin D Connecter:

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

3. Continuously output protocol

Con1: **Weighing mode**

10. DRAWING


Wind case is Optional and according to Specifications
Pan Size may vary according to Specifications (Ø80mm、Ø120mm、Ø135mmEtc.)
Optional
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S. No	Parts Name	Qty	Spec
39	Name Plate	1	Sticker
38	NB Adjustable foot Front	2	ABS
37	Star Self Thread Screws M4*12	4	
36	Sealing Sticker	1	
35	ABS Sealing Slice	1	ABS
34	Main PCB	1	
33	Big Star Head Screws M4*10	1	SUS304
32	Star Head Screw M3*6	1	
31	Load Cell	1	Al
30	Hanging Bracket	1	SUS304
29	Hex Nut M4	1	
28	L Shaped hanging bracket	1	SUS304
27	Star Screw M4*12	1	
26	Gasket M3	10	EPDM
25	Display PCB	1	
24	Front Housing	1	ABS
23	Water Level Bubble ø14.7	1	
22	NB Overlay	1	PC/PET
21	NB Adjusting Foot Rear	2	ABS
20	Bottom Housing	1	ABS
19	Flat Spacer M3	2	
18	Load Cell Lower bracket	1	Al
17	Star Screw M4*10	4	
16	RS-232 PCB	1	
15	Self Thread Screw M3*10	10	
14	Rechargable battery	1	6V1.2Ah
13	Load Cell Upper Bracket	1	ABS
12	Load Cell Spacer	1	SUS304
11	M3*12 Hex Screw	4	Carbon Steel
10	S.SWind case base cover	1	SUS304
9	Sealing Road (OIMLVersions)	1	SUS304
8	ABS Pan ø120	1	ABS
7	Allen Screw M4*12	1	Carbon Steel
6	S.S Pan ø120	1	SUS304
5	NB Wind Glass Case Side 2	2	Fiber Glass
4	Round Rubber Pad	4	Rubber
3	NB Wind Case Pole	4	Al
2	NB Wind Case Glass Side 1	2	Fiber Glass
1	Wind case Top Cover	1	Al

11. 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.
FA i L H / FA i L L / FA i L	Calibration Error	Check the test weights & Re calibrate
bA Lo / Lo bA	Battery low	Re charge battery, check the voltages.