FH High Precision Balance

User Manual



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INSTRUCTION FOR USE

Thank you for purchasing **FH high precision balance**.
To enable you to use this balance correctly, we suggest that you read these instruction carefully.

1. It must be prevented from getting wet. If it gets wet, please wipe it dry with a cloth. If there is something wrong with the machine, please contact your supplier.
2. Keep it away from high temperatures and damp conditions.
3. Don't bump the balance against other items, nor load it with excessively heavy weights (The load must not exceed the maximum capacity of the balance).
4. If a balance is not used for a long period of time, please remove the dry batteries, clean and store in a polythene bag. A desiccant may be included.
5. Objects to be weighed should be placed at the center of the platter, and can't exceed the dimension of the platter.
6. Any opinions and suggestions on this product are welcome.

PREPARING TO USE THE BALANCE

1. For accurate weight readings locate the scale on a firm level surface free from vibrations.
2. Avoid operating the scale in direct sunlight or drafts of any kind.
3. Remove any weight that might be on the weigh pan before the scale is switched on and avoid leaving weight on the pan for long periods of time.
4. Please use an independent power outlet to avoid interfered by other electrical appliances.
5. Don't put any object on the scale while switching on the balance.
6. Please keep the balance switched on for 15~20 minutes before operation.
7. When the low battery indicator  appears in the right corner of the display, replace the dry batteries or recharge the battery.

CHAPTER ONE PRODUCT FEATURES

1-1 Features

*Internal resolution up to 1/1,200,000

*Auto calibration, auto zero tracking, double overload protection

*Weighing, counting and percentage application modes

*Selectable weighing units, up to 13 weighing units available

*LED backlight, more durable, more energy saving

*Auto temperature and linearity compensation

*A/D sampling speed setting

*Gravity value calibration

*Selectable default weighing units

*Auto power off setting

*Both plug and rechargeable models available

*Excellent protection for transportation

*Build-in bi-directional RS232 interface

Options:

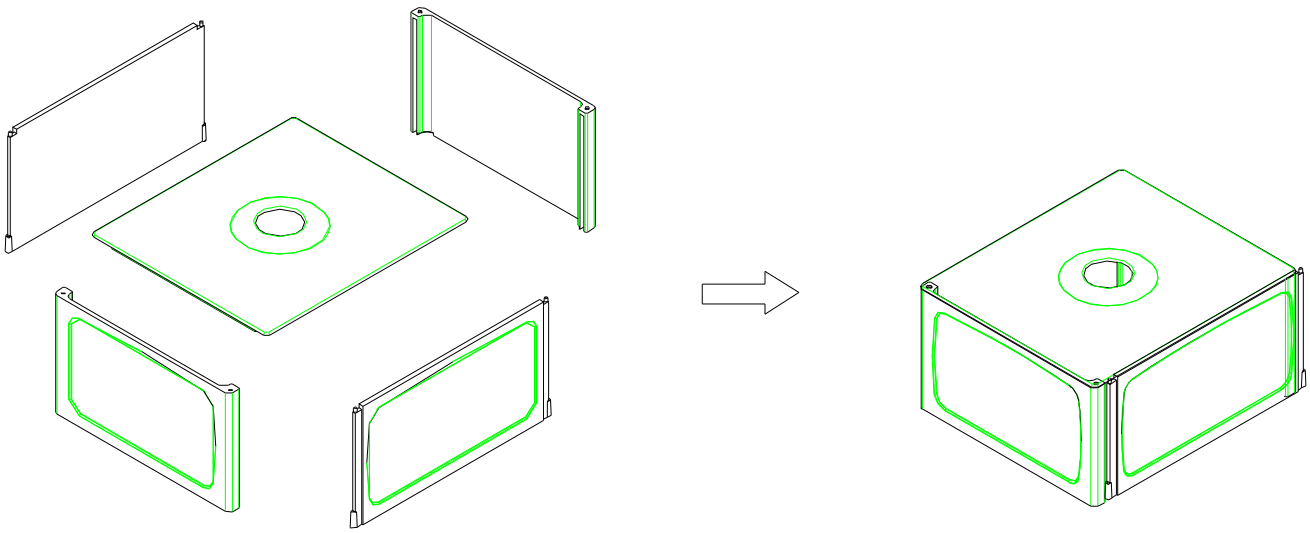
*RTC (Time and date printing)

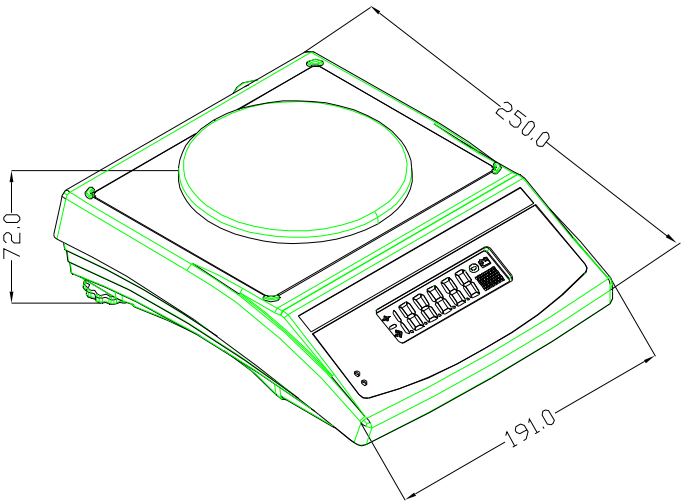
1-2 Specifications

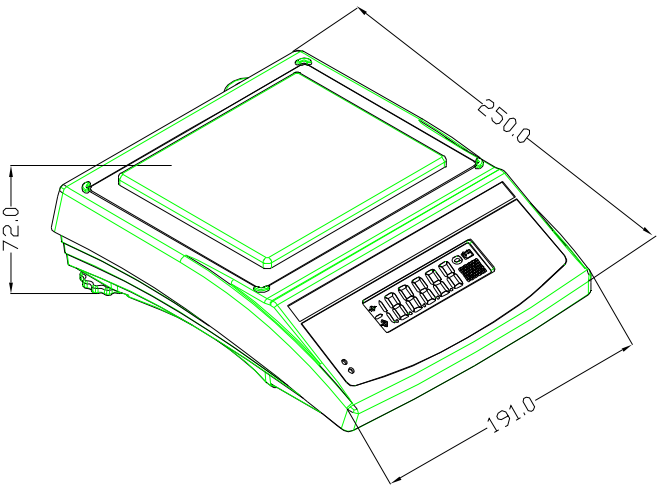
External Resolution: 1/120000 & 1/150000

		600 Series	1200 Series	3000 Series
g	Hr	600× 0.005	1200 × 0.01	3000 × 0.02
	nr	600 × 0.05	1200 × 0.1	3000 × 0.2
ct	Hr	3000 × 0.05	6000 × 0.05	15000 × 0.1
	nr	3000 × 0.5	6000 × 0.5	15000 × 1
lb	Hr	1.32 × 0.00002	2.64 × 0.00005	6.61 × 0.00005
	nr	1.32 × 0.0002	2.64 × 0.0005	6.61 × 0.0005
oz	Hr	21.1 × 0.0002	42.3 × 0.0005	105 × 0.001
	nr	21.1 × 0.002	42.3 × 0.005	105 × 0.01
dr	Hr	338 × 0.005	670 × 0.01	1690 × 0.02
	nr	338 × 0.05	670 × 0.1	1690 × 0.2
GN	Hr	9200 × 0.1	18500 × 0.2	46200 × 0.5
	nr	9200 × 1	18500 × 2	46200 × 5
ozt	Hr	19.2 × 0.0002	38.5 × 0.0005	96 × 0.001
	nr	19.2 × 0.002	38.5 × 0.005	96 × 0.01
dwt	Hr	385 × 0.005	770 × 0.01	1920 × 0.02
	nr	385 × 0.05	770 × 0.1	1920 × 0.2
MM	Hr	160 × 0.002	320 × 0.005	800 × 0.01
	nr	160 × 0.02	320 × 0.05	800 × 0.1
tl.J	Hr	16 × 0.0002	32 × 0.0005	80 × 0.001
	nr	16 × 0.002	32 × 0.005	80 × 0.01
tl.T	Hr	16 × 0.0002	32 × 0.0005	80 × 0.001
	nr	16 × 0.002	32 × 0.005	80 × 0.01
tl.H	Hr	15.8 × 0.0002	31.7 × 0.0005	79 × 0.001
	nr	15.8 × 0.002	31.7 × 0.005	79 × 0.01
t	Hr	51.4 × 0.0005	102 × 0.001	257 × 0.002
	nr	51.4 × 0.005	102 × 0.01	257 × 0.02

1-3 Plastic Shield Installation & Dimension







1-4 Description of Power Supply

Power supplies

1. 1.8 Ah Ni-MH Rechargeable Battery
2. 9V DC 500mA Adaptor

Power Consumption

1. The power consumption is around DC 0.5 mA (standby mode).
2. The power consumption is around DC 28~35 mA (system + load cell).
3. The power consumption is around DC 40~50 mA (system + load cell + backlight).

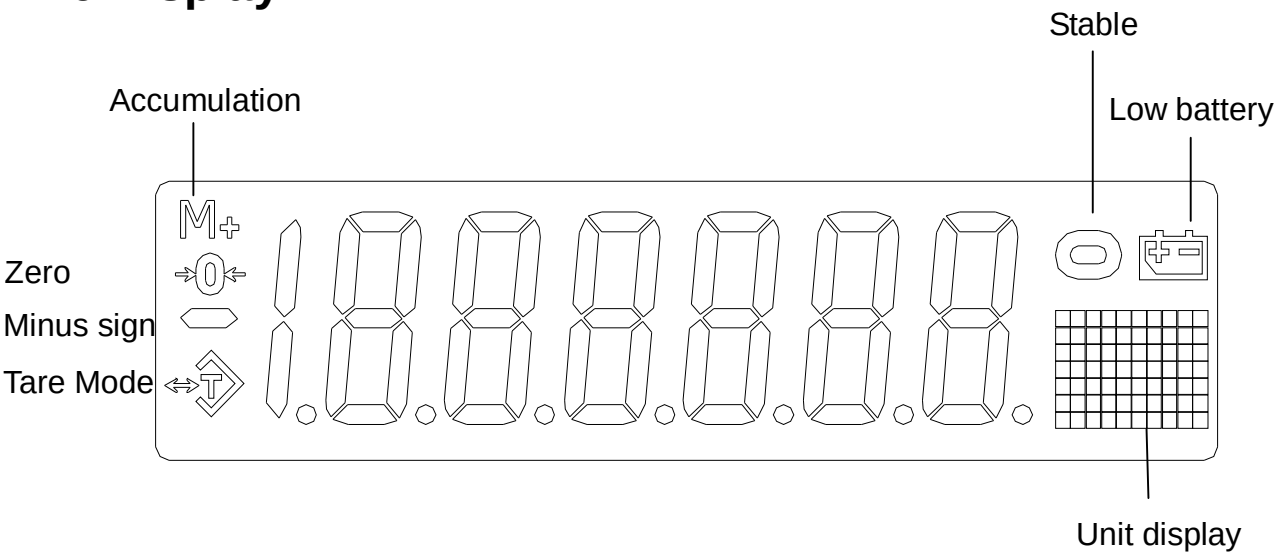
Low Battery

Please note when the  symbol is shown on the display, the internal battery needs to be replaced or recharge the battery.

1-5 Error Messages

If one of the error messages E 1, E2, E5 or oL is displayed, please send the balance back to your dealers for repair.

1-6 Display



1-7 Keyboard Function

OFF : Off key. Press the key to switch the balance off.

MODE : Function key. Press the key to select different operation modes: weighing mode, counting mode, and percentage mode.

UNITS : Units key. Press the key to select the desired weighing unit.

HR
6 : Resolution switching key. With an approval model, press the key to switch from normal to high resolution. With a standard model, press the key to show the unit weight.
" 6 " ⇒ In the calibration mode or function settings, press the key for downward digit selection and downward moving.

Pcs
5 : Sample key. In the counting or percentage mode, press the key to calculate the unit weight of the sample.
" 5 " ⇒ In the calibration mode or function settings, press the key for upward digit selection and upward moving..

: Confirmation key. Press the key to confirm the setting.

T
3 : Tare key. Press the key to deduct the weight of a container. To exit the tare mode, press the tare key again, when the plate is empty.
" 3 " ⇒ In the calibration mode or function setting, press the key to move the cursor one step to the left.

→0←
ON
4 : On/Zero key. When the scale is off, press the key to switch the scale on. When the scale is on, press the key to zero the scale.
" 4 " ⇒ In the calibration mode or function setting, press the key to move the cursor one step to the right.

CHAPTER TWO OPERATION INSTRUCTIONS

2-1 Zero Function

When the display shows weight value without anything placed on the platter, press the →0← ON key to re-zero the balance. The zero indicator **à**0**ß** is on, indicating a center-of zero gross weight condition.

Note: Zero Range

- For OIML models = The displayed weight is within ±2% of scale capacity.
- For Sri Lanka Model 1 = The initial zero (calibration zero) ±3% of full scale capacity.
  For Sri Lanka Model 2 = The zero point at switch on ±3% of full scale capacity.

2-2 Simple External Calibration

(The function is not available for approval models)

Press the ↵ key for 3 seconds, the **calibration weight value*** shows in the display. Place the same weight as the calibration weight value on the platter. After stable, the calibration procedure is completed.

- **Calibration weight value*** = The value was input in the external weight calibration setting. (Please refer to page 26)

2-3 Operation Mode Conversion

Press the MODE key to convert among the available operation modes: Weighing Mode, Counting Mode and Percentage Mode. When selecting a different operation mode, the representative unit or symbol (g, pcs and %) will show in the right side of display.

2-3-1 Weighing Mode

1. Units Selection

Press the UNITS key to select the desired weighing unit.

4 There are 13 units available: g, ct, lb, oz, dr, GN, ozt, dwt, MM, tl.J, tl.T, tl.H and t.

2. Precision Shifting Function (only available for approval models)

Press the HR key to shift from general resolution to high resolution.

3. Display Unit Weight Function (only available for non-approval models)

Press the HR key to shift between Display Unit Weight Mode and Display pcs Mode.

4. Tare Function

1. Place the container on the platter. After stable, press the →T← key to deduct the container weight. The display returns to zero and the tare indicator →T← is on.
2. Place the object into the container, and the net weight of the object is displayed.
3. Remove the container and the object from the platter, and the negative value of the container weight is displayed. Press the →T← key again to re-zero and the tare indicator is off.

Ø The balance can be tarred continuously up to its full capacity.

Ø If the tare indicator →T← is still on, after pressing the →T← key to exit the tare mode. Please press the →0← ON key to zero the balance, and the tare indicator →T← will go off.

2-3-2 Counting Mode

1. Sampling

1. Press the MODE key to select the Counting mode and the display shows C 10 pcs.
2. Press the Pcs key to select a sample size from 10, 20, 50, 100, or 200 pcs.
3. Place as many items as the selected sample size, and press the ↵ key. After the sign "– – – – – –"disappears, the sampling process is completed and the balance is ready to count.
4. Press the HR key to shift between "Unit Weight Mode Display" and "PCS Mode Display".

Ø The unit weight of sample is not sufficient: The weight of a sample should be heavier than the 0.2d (d=division). When the unit weight of the sample is too small (less than 0.2 divisions), **"– – □ – – pcs"** is displayed.

Ø The last sample size is memorized when the balance is switched off. When the balance is switched on again, press the Pcs key to enter the counting mode.

2-3-3 Percentage Mode

1. Sampling

1. Press the MODE key to select the “Percentage” mode and the display shows

   100.0 %.

2. Press the Pcs key to select 100.0% or 100.00%.

3. Place enough sampling weight on the platter and press the ↵ key. Wait until the sign

   “– – – – – –“disappears, and % symbol in the right lower corner of the display stops flashing .

   The sampling procedure is completed, and the percentage mode is ready.

4. Press the HR key to shift between “the general resolution mode (100.0%)” and “the high resolution mode (100.00%)”.

Ø When the unit weight of the sample is too small (less than 0.2 divisions),

“– – 0 – – **%”** is displayed.

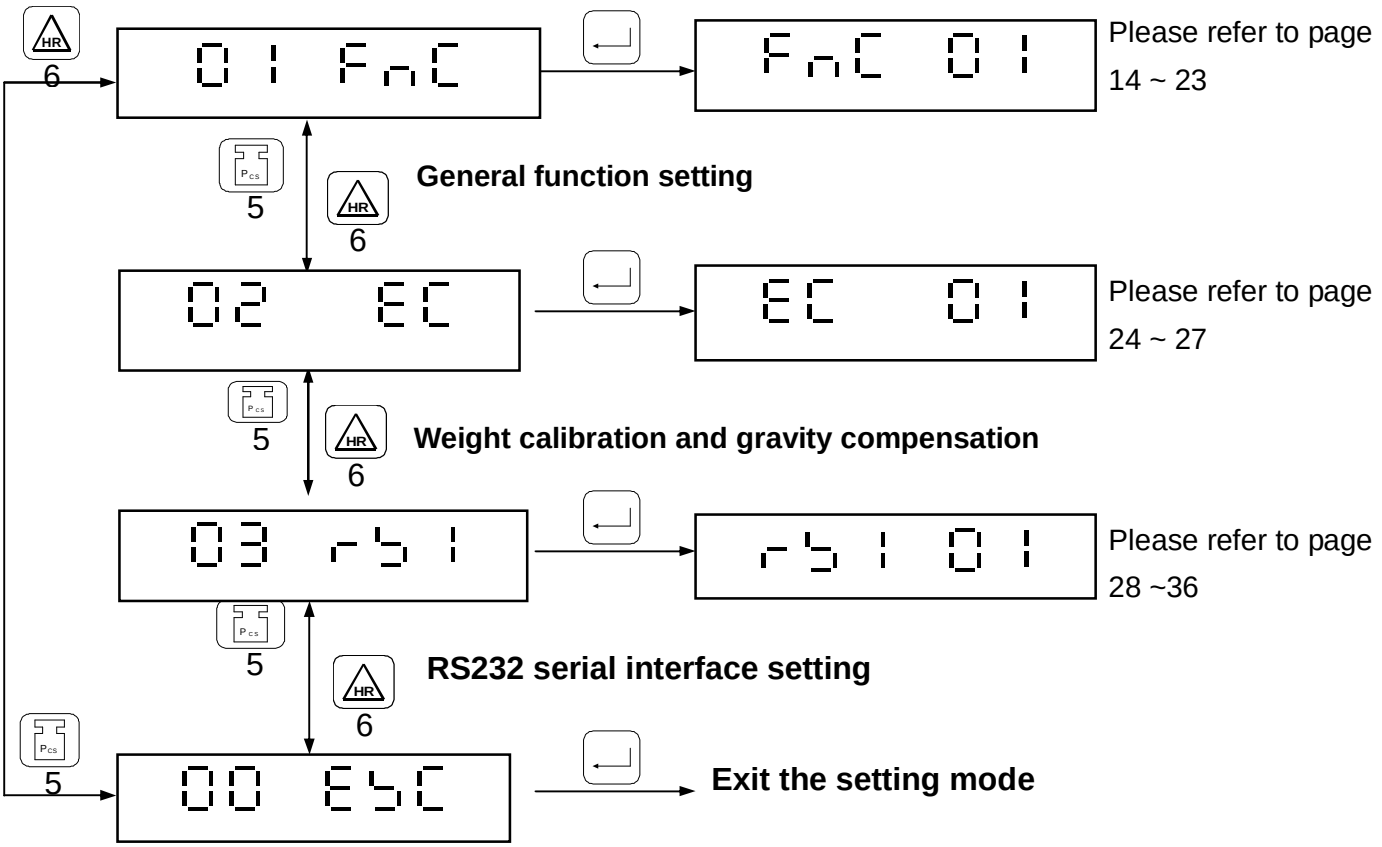
Ø The last sample size is memorized when the balance is switched off. When the balance is switched on again, press the Pcs key to enter the percentage mode.

Notes

1. In the counting or percentage mode, press the MODE key or the UNITS key to switch to the weighing mode, after the sampling process is completed. Press the Pcs key to convert the balance into the counting or percentage mode, and the balance memorizes the data of sampling that has previously been taken.
2. While shifting between the counting and percentage modes, the last sampling data will be saved automatically.

CHAPTER THREE FUNCTION SETTINGS

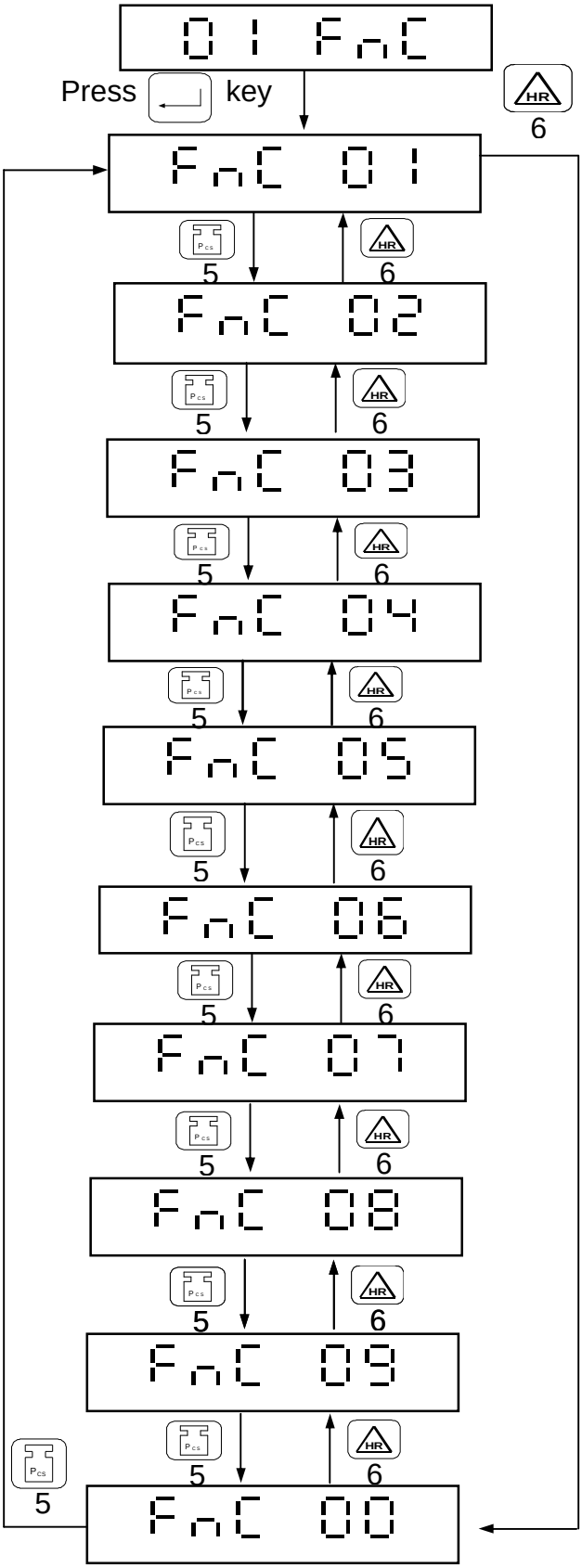
4 Press MODE key for 3 seconds or hold MODE and ↵ keys together, the balance enters the function setting mode, and the display shows 01 FnC.



01 FnC	⇒	General function setting
02 EC	⇒	Weight calibration and gravity compensation
03 rS1	⇒	RS232 serial interface setting
00 EsC	⇒	Exit the setting mode

3-1 GERNERAL FUNCTION SETTING 01 FnC

4 There are nine functions settings available FnC 01 ~ FnC 09.



FnC 00 ⇒ Back to the previous level

FnC 01 ⇒ First unit setting

FnC 02 ⇒ Operation units setting

FnC 03 ⇒ Auto-off timer setting

FnC 04 ⇒ Backlight mode setting

FnC 05 ⇒ Noise filter setting

FnC 06 ⇒ Zero display range setting

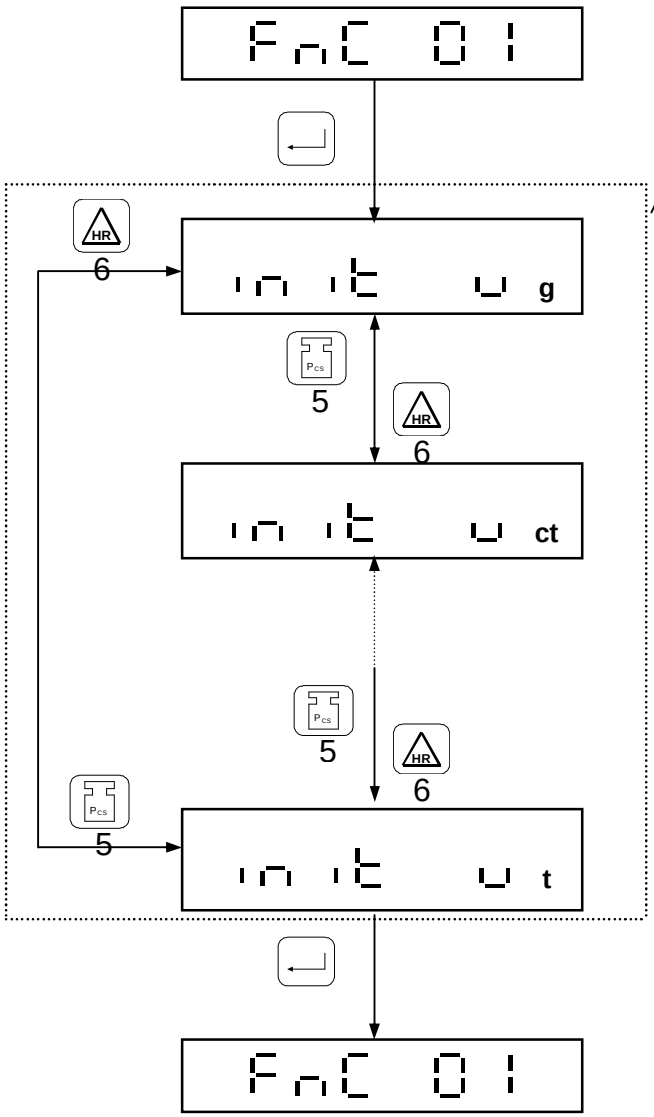
FnC 07 ⇒ Back to zero display setting

FnC 08 ⇒ Auto unit weight averaging setting

FnC 09 ⇒ Zero Tracking Range Setting

3-1-1 First Unit Setting FnC 01

4 The default setting is “g”



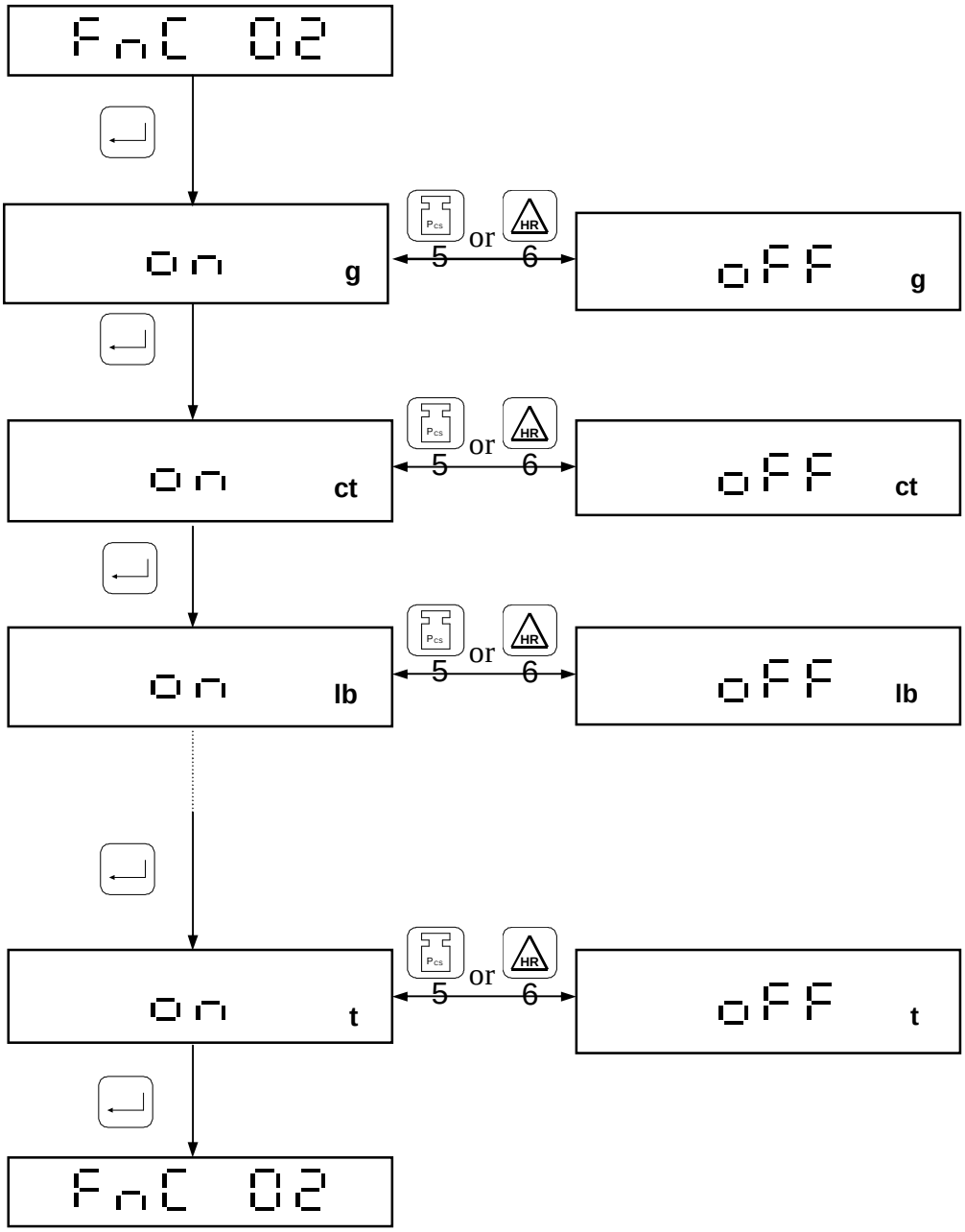
Use the Pcs 5 or HR 6 key to select the unit in cycle, and press the ↵ key to confirm the setting.

There are 13 weighing units available for selection: g, ct, lb, oz, dr, GN, ozt, dwt, MM, tl.J, tl.T, tl.H, t

3-1-2 Operation Units Setting FnC 02

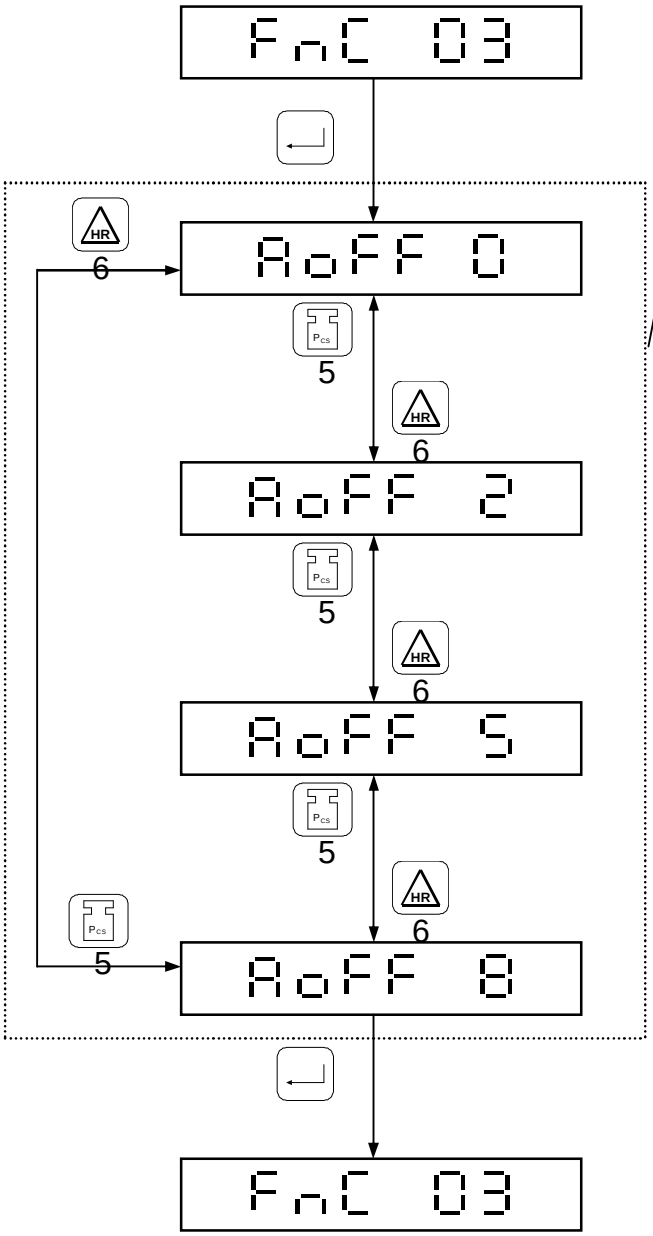
There are 13 weighing units available for selection. Use the Pcs (5) or the HR (6) key to switch between **ON** and **OFF** for each unit.

4 The default setting for all 13 units are “ON”



3-1-3 Auto-Off Timer Setting FnC 03

4 The default setting is “ 0 ”



Use the Pcs 5 or the HR 6 key to select one from the four modes:

Press the ↵ key to confirm and the setting procedure is completed.

AoFF 0 ⇒ Auto-off not available

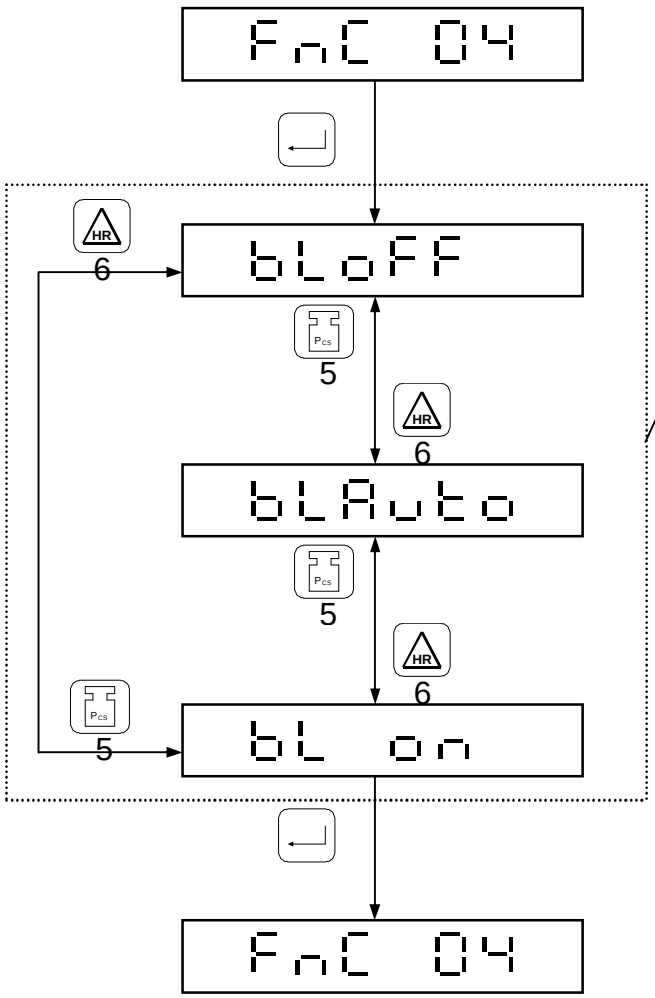
AoFF 2 ⇒ Auto-off after 2 minutes

AoFF 5 ⇒ Auto-off after 5 minutes

AoFF 8 ⇒ Auto-off after 8 minutes

3-1-4 Backlight Mode Setting FnC 04

- The default setting is " OFF " (The auto backlight is off)
- Auto backlight ⇒ When there is weight on the platter (the value is larger than 10 divisions), or when any key is pressed, the backlight is on. After the weight on the platter keeps under 10 divisions while no key is pressed, the backlight will be off in about 10 seconds.



Use the Pcs 5 or the HR 6 key to select one from three backlight modes.
Press the ↵ key to confirm the setting.

bLoFF ⇒ Backlight is off
bLAuto ⇒ Auto backlight
bL on ⇒ Backlight is on all the time

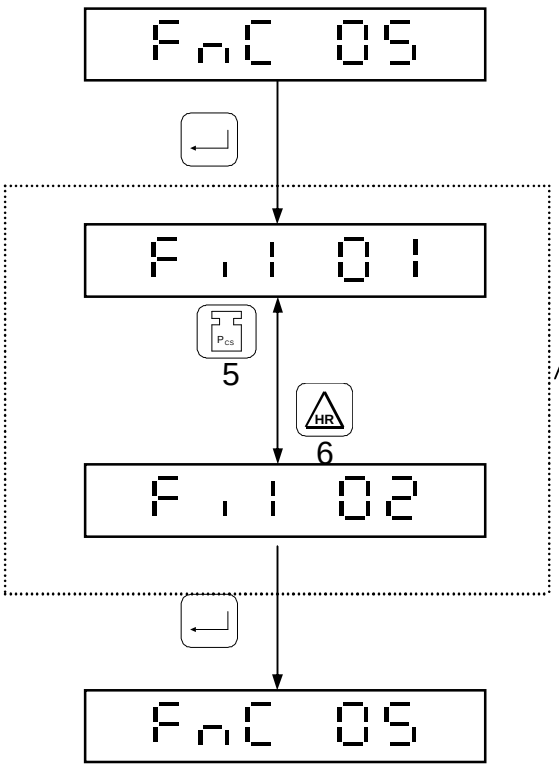
3-1-5 Noise Filter Setting FnC 05

Set a parameter in 01 to 02, according to the environment where the balance is positioned.

- Please select " 01 ", when operation environment is unstable.
- Please select " 02 ", when operation environment is stable.

4 This function is not accessible for approval models.

4 The default setting is " 01 "



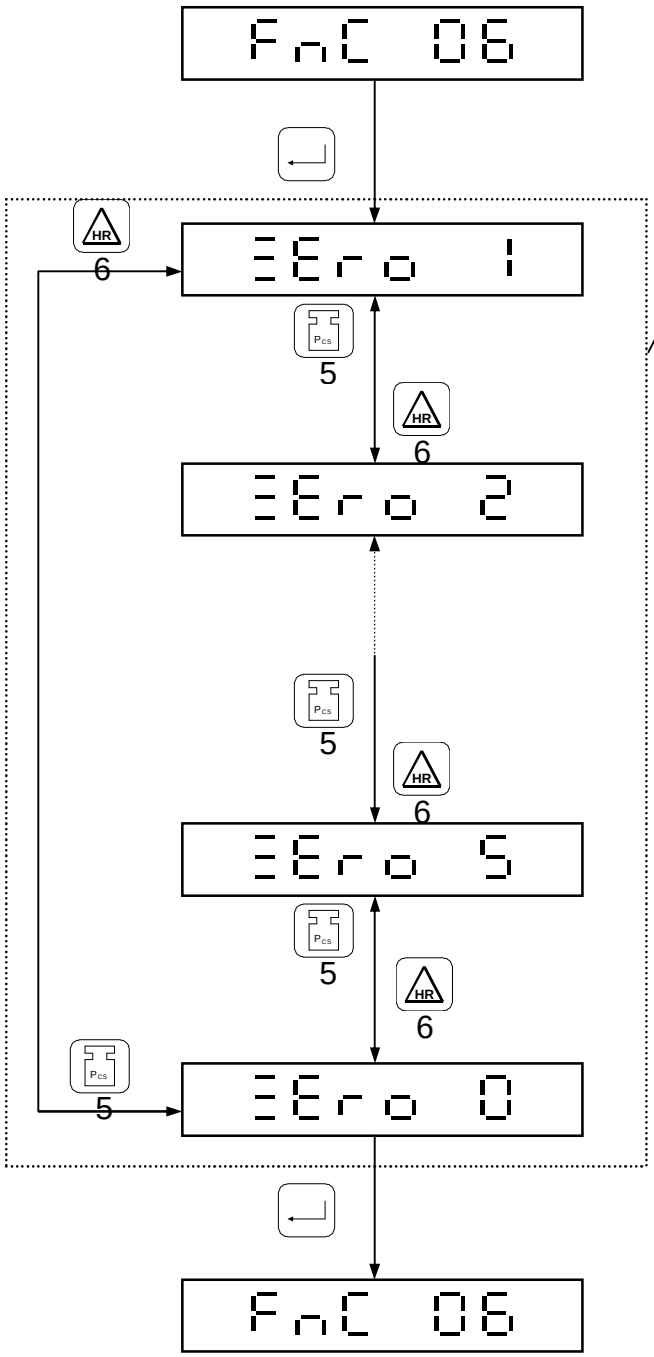
Use the 5 or the 6 key to select a proper parameter.

Press the ↵ key to confirm the setting.

F.1 01 ⇒ For unstable environment
F.1 02 ⇒ For stable environment

3-1-6 Zero Display Range Setting FnC 06

- This function is not accessible for approval models.
- The default setting is " 1 " (1d, d=division)



Use the Pcs 5 or the HR 6 key to select a zero display range.

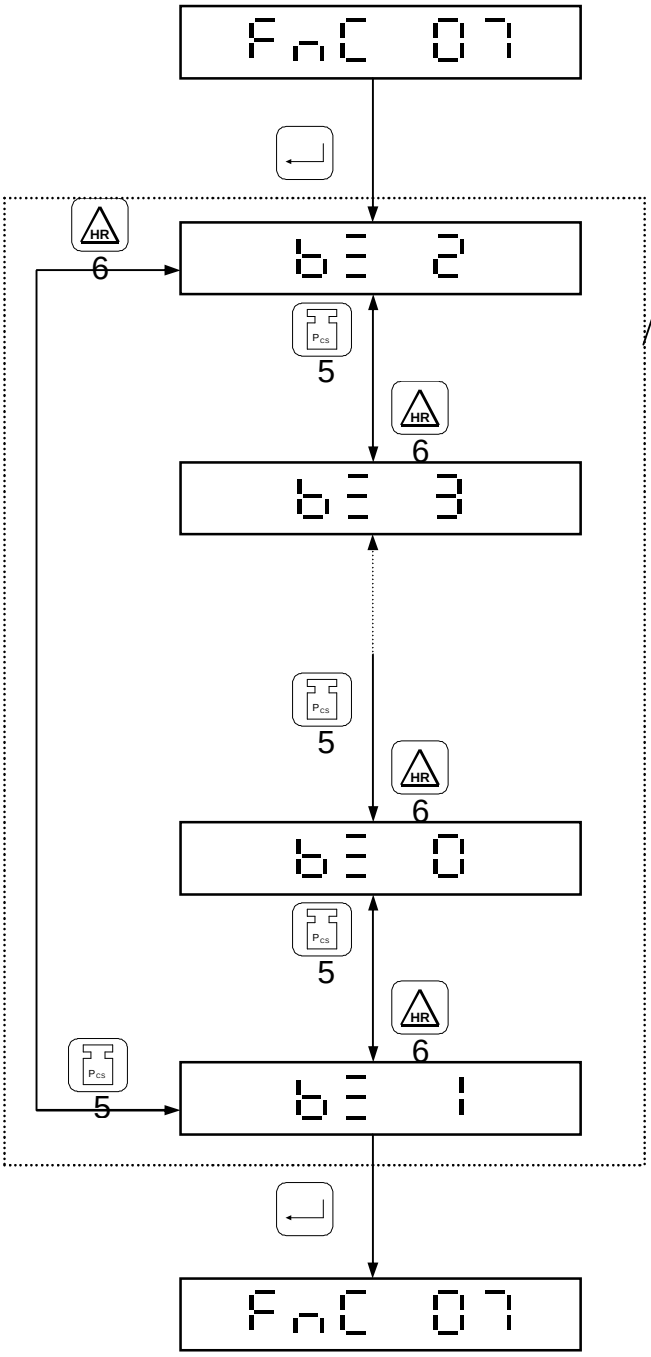
Press the ↵ key to confirm the setting.

Zero Display Range: (d=division)

Zero 0 ⇒ 0 d
Zero 1 ⇒ 1 d
Zero 2 ⇒ 2 d
Zero 3 ⇒ 3 d
Zero 4 ⇒ 4 d
Zero 5 ⇒ 5 d

3-1-7 Back to Zero Display Setting FnC 07

- This function is not accessible for approval models.
- The default setting is " 2 " (2d, d=division)



Use the 5 or the 6 key to select a proper parameter.

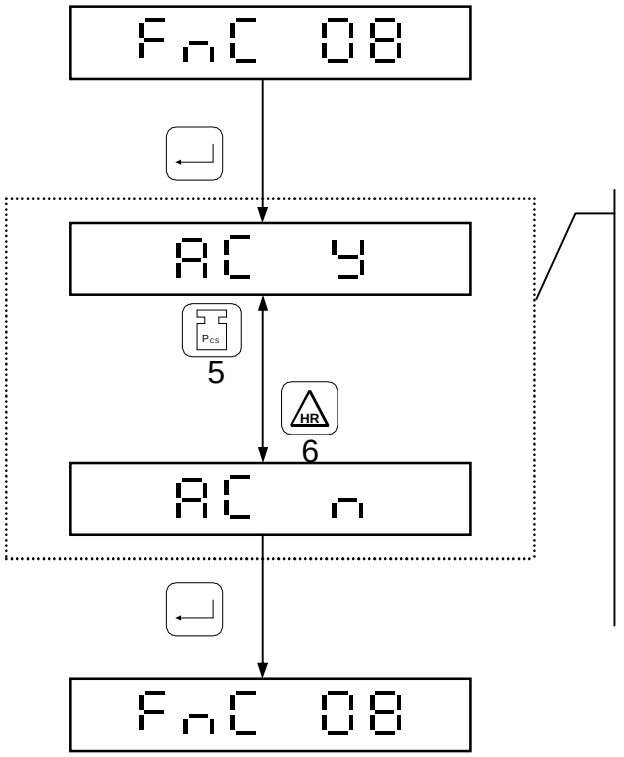
Press the key to confirm the setting.

Back to zero display setting: (d=division)

- b0 ⇒ 0 d
- b1 ⇒ 1 d
- b2 ⇒ 2 d
- b3 ⇒ 3 d
- b4 ⇒ 4 d
- b5 ⇒ 5 d

3-1-8 Auto Unit Weight Averaging Setting FnC 08

4 The default setting is " Yes" (Automatic Unit Weight Calibration)



Use the 5 or the 6 key to select "Yes" or "No."

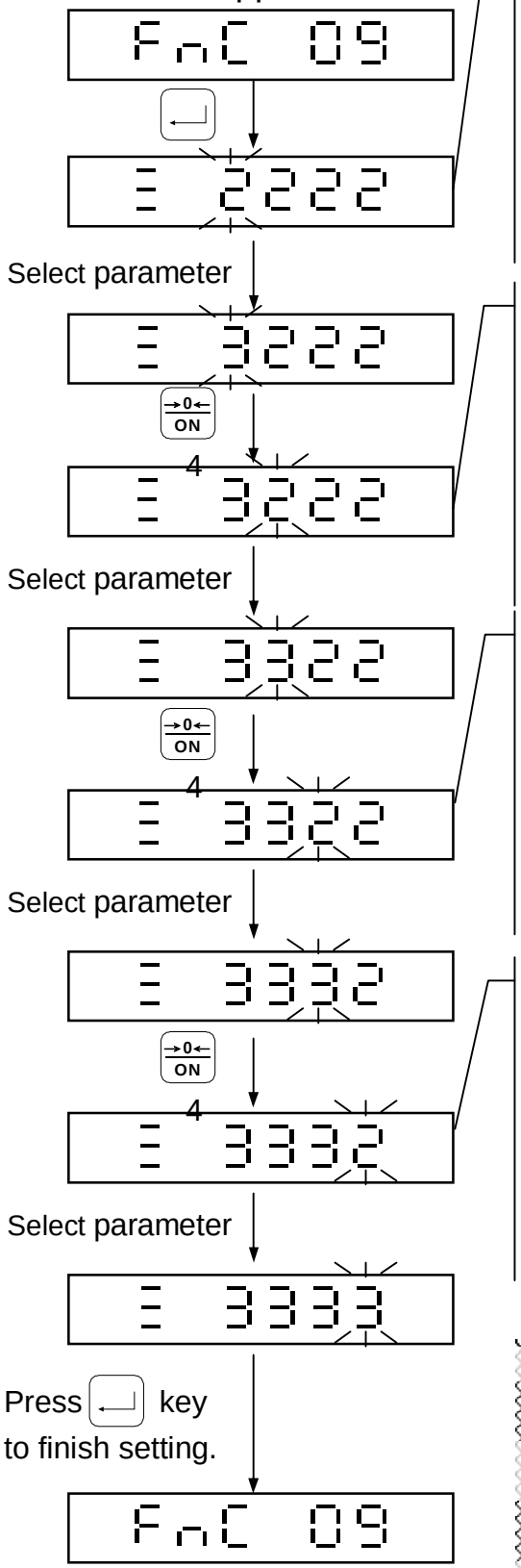
Press the ↵ key to confirm the setting.

AC Y ⇒ **YES** (Auto Unit Weight Averaging is active)

AC n ⇒ **NO** (Auto Unit Weight Averaging is off)

3-1-9 Zero Tracking Range Setting FnC 09

4 Not available for approved model.



Zero Tracking Range Setting
(default value: 2 ⇒ 2/4 e)

Press Pcs (5) or HR (6) key to select parameter.

1 ⇒ 1/4 e 2 ⇒ 2/4 e 3 ⇒ 3/4 e
4 ⇒ 4/4 e 5 ⇒ 5/4 e 6 ⇒ 6/4 e
7 ⇒ 7/4 e 8 ⇒ 8/4 e

Zero Indication Range Setting
(default value: 2 ⇒ 2/4 e)

Press Pcs (5) or HR (6) key to select parameter.

1 ⇒ 1/4 e 2 ⇒ 2/4 e 3 ⇒ 3/4 e
4 ⇒ 4/4 e 5 ⇒ 5/4 e 6 ⇒ 6/4 e
7 ⇒ 7/4 e 8 ⇒ 8/4 e

Stable Range Determination Setting
(default value: 2 ⇒ 2/4 e)

Press Pcs (5) or HR (6) key to select parameter.

1 ⇒ 1/4 e 2 ⇒ 2/4 e 3 ⇒ 3/4 e
4 ⇒ 4/4 e 5 ⇒ 5/4 e 6 ⇒ 6/4 e
7 ⇒ 7/4 e 8 ⇒ 8/4 e

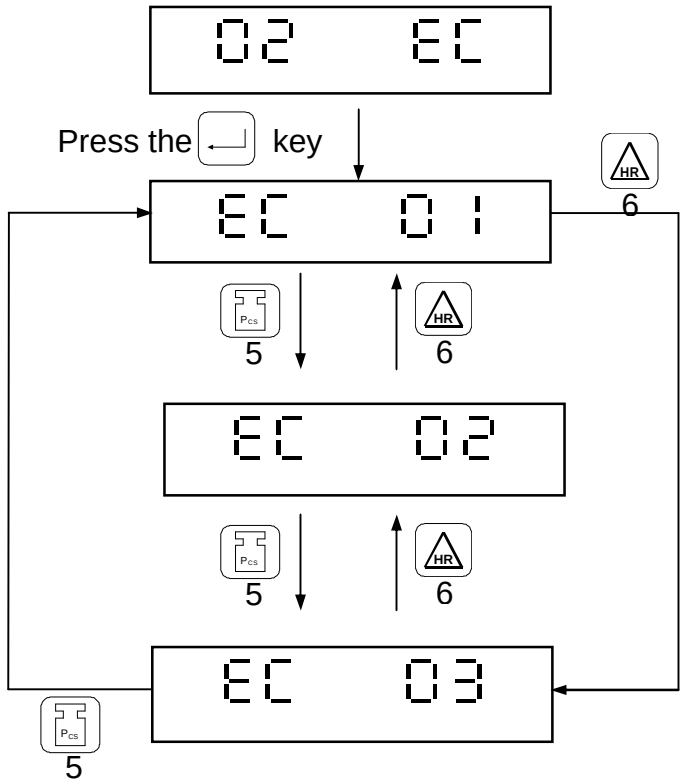
Stable Times Determination Setting
(default value: 2 ⇒ 2/4 e)

Press Pcs (5) or HR (6) key to select parameter.

1 ⇒ 1/4 e 2 ⇒ 2/4 e 3 ⇒ 3/4 e
4 ⇒ 4/4 e 5 ⇒ 5/4 e 6 ⇒ 6/4 e
7 ⇒ 7/4 e 8 ⇒ 8/4 e

Pcs (5) ⇒ Upward digit selecting (0-9)
HR (6) ⇒ Downward digit selecting (0-9)
→T (3) ⇒ Move the cursor leftward
→0← ON (4) ⇒ Move the cursor rightward
↵ ⇒ Confirmation key

3-2 Weight Calibration and Gravity Compensation 02 EC



EC 01 ⇒ Weight Calibration

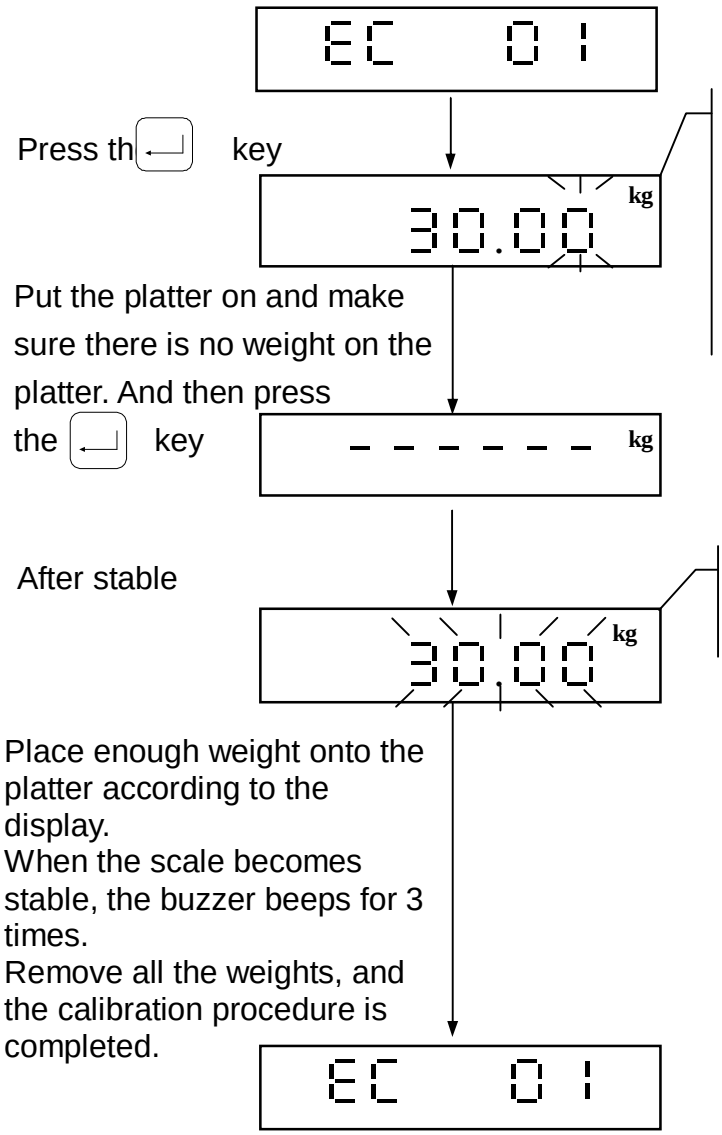
EC 02 ⇒ Gravity Compensation

EC 03 ⇒ Restore to the default setting

4 This function is not accessible for approval models.

4 When CFn 04 set as “YES” for the external Gravity calibration function, the EC 02 function is available.

3-2-1 External Weight Calibration EC 01



5 Þ **Upward digit selecting (0-9)**

6 Þ **Downward digit selecting (9-0)**

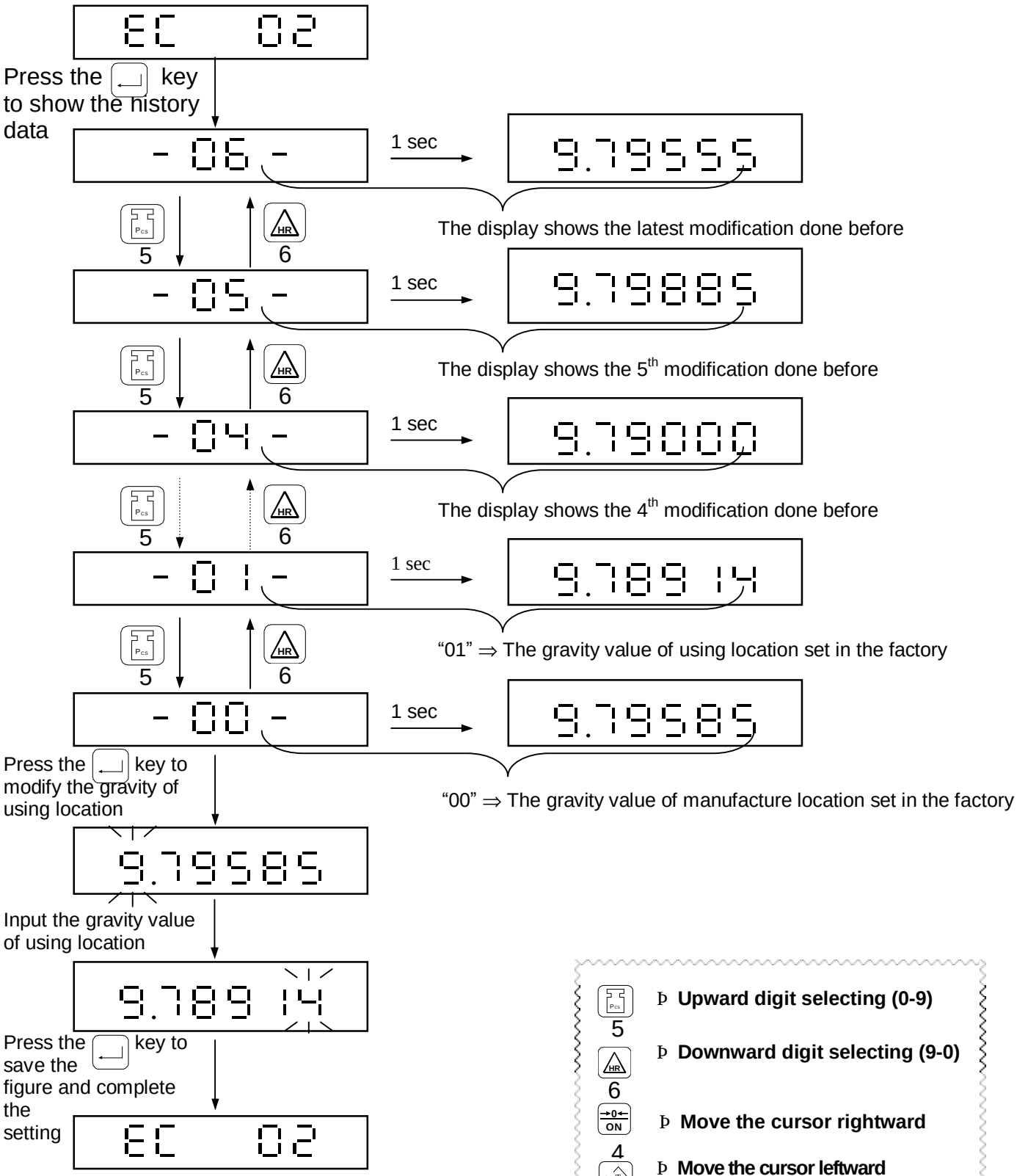
4 Þ **Move the cursor rightward**

3 Þ **Move the cursor leftward**

4 EC 01 is not accessible for approval models.

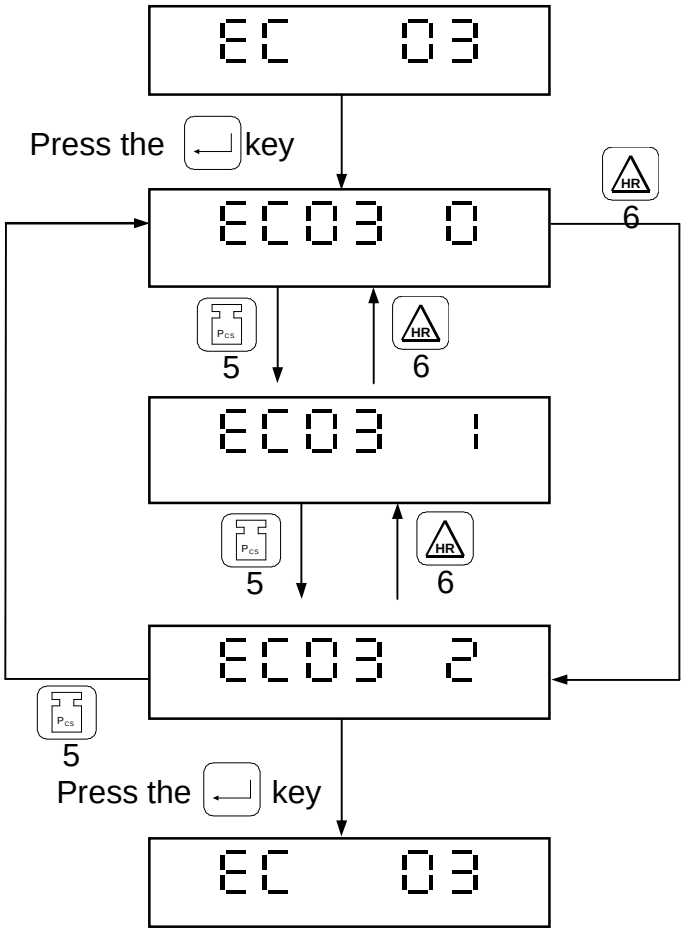
4 The input calibration weight must be the value ranged from 90% to 110% of interval value of the original calibration weight.

3-2-2 Gravity Compensation EC 02



- 5 ⇒ **Upward digit selecting (0-9)**
- 6 ⇒ **Downward digit selecting (9-0)**
- 4 ⇒ **Move the cursor rightward**
- 3 ⇒ **Move the cursor leftward**

3-2-3 Restore to the Default Setting EC 03

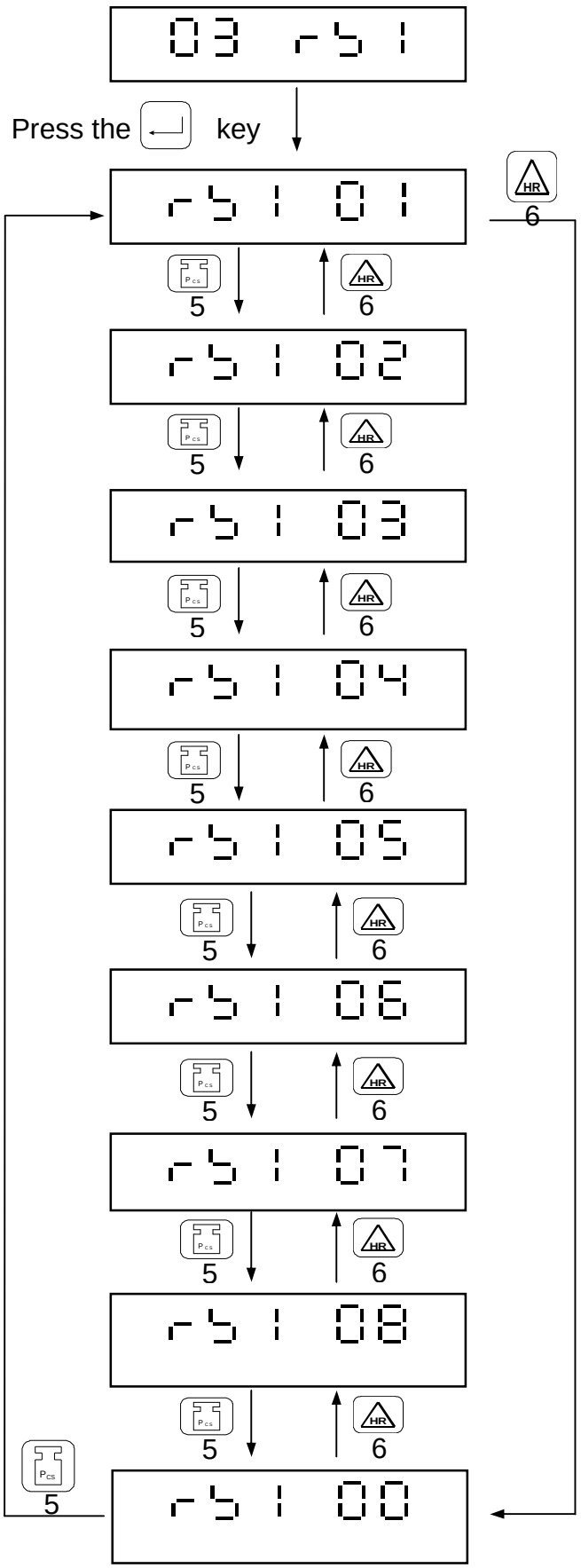


EC03 0 ⇒ Return to upper level

EC03 1 ⇒ Restore to the default setting in external weight calibration and gravity compensation

EC03 2 ⇒ Restore to the default setting in the general function settings

3-3 RS232 SERIAL INTERFACE SETTING 03 r51



r51 00 ⇒ Return to upper level

r51 01 ⇒ Transmission Mode Setting

r51 02 ⇒ Baud Rate Setting

r51 03 ⇒ Communication Protocol setting

r51 04 ⇒ Output Format Setting

r51 05 ⇒ Re-zero Range Setting

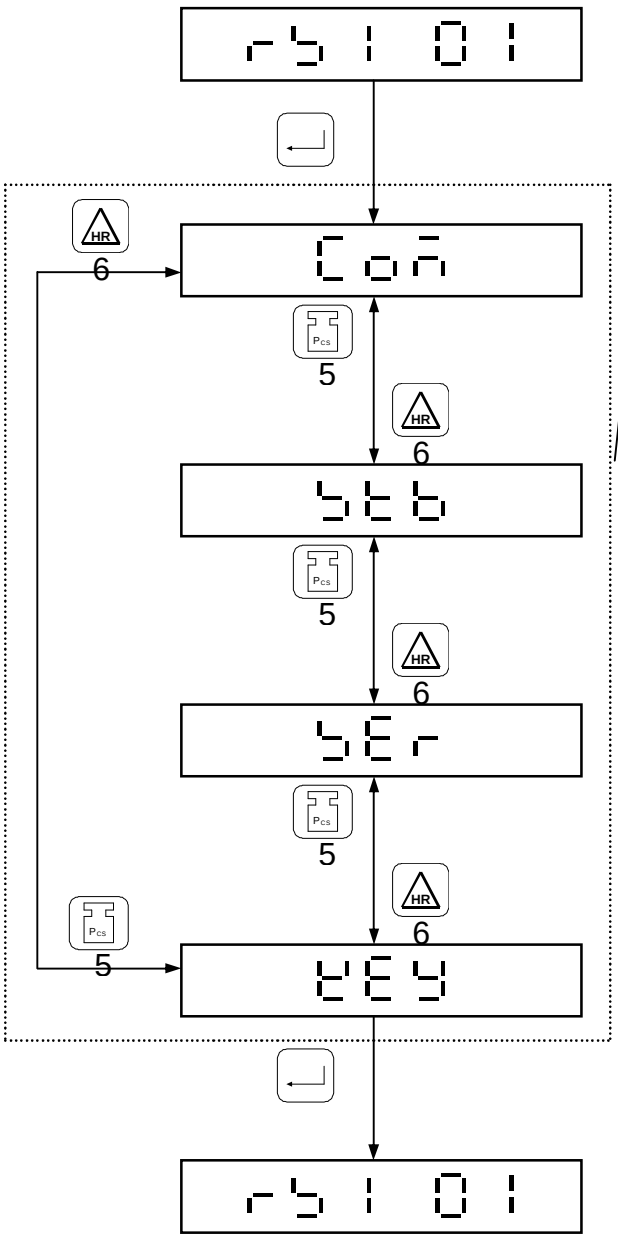
r51 06 ⇒ Weight Range Setting

r51 07 ⇒ Date & Time Display setting

r51 08 ⇒ Date & Time Setting

3-3-1 Transmission Mode Setting r S 1 0 1

4 The default setting: " Con "



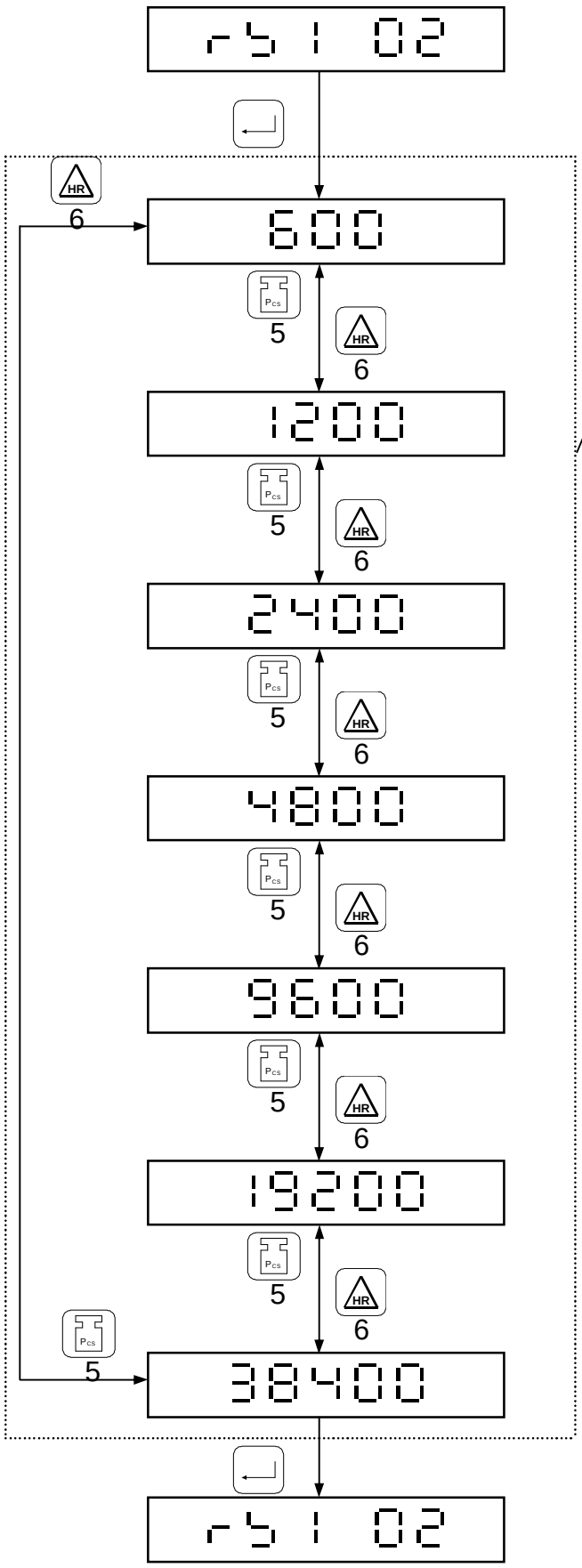
Use the 5 or the 6 key to select from the 4 modes available:

Press the ↵ key to confirm the setting.

- Con ⇒ Directive Mode
- Stb ⇒ Stable transmission + Directive Mode
- SEr ⇒ Continuous transmission + Directive Mode
- UEY ⇒ Manual transmission + Directive Mode

3-3-2 Baud Rate Setting rS1 02

4 The default setting: " 9600 "



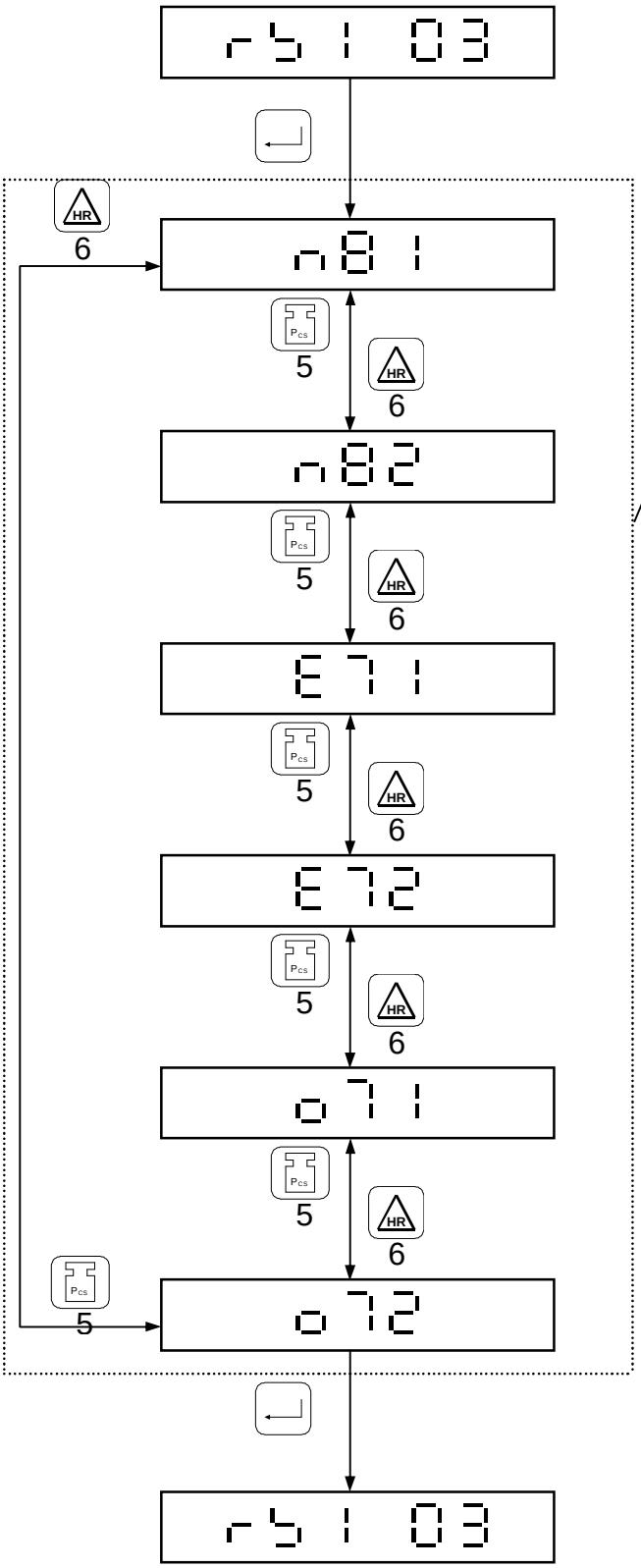
Use the Pcs (5) or the HR (6) key to select from the 7 baud rates.

Press the ↵ key to confirm the setting.

600 ⇒ 600 bps
1200 ⇒ 1200 bps
2400 ⇒ 2400 bps
4800 ⇒ 4800 bps
9600 ⇒ 9600 bps
19200 ⇒ 19200 bps
38400 ⇒ 38400 bps

3-3-3 Communication Protocol Setting r51 03

4 The default setting: " n81 "



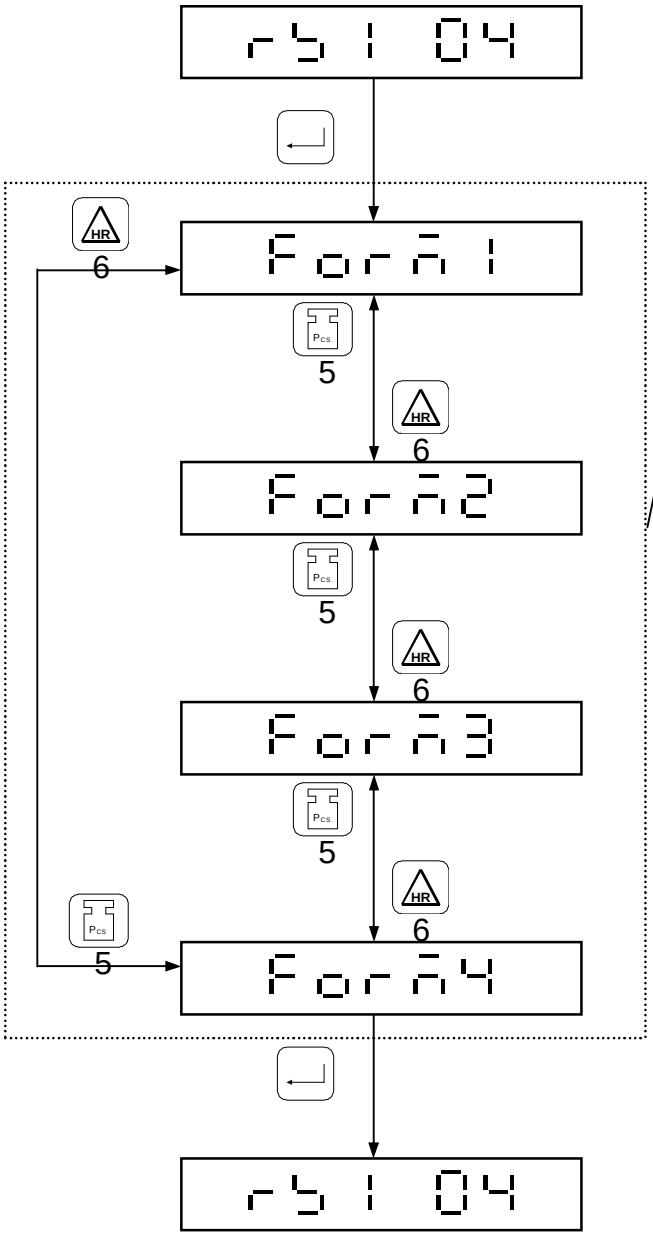
Use the 5 or the 6 key to set the parameter

Press the ↵ key to confirm the setting.

- n81 ⇒ 8 data bit, No parity bit, 1 stop bit
- n82 ⇒ 8 data bit, No parity bit, 2 stop bit
- E71 ⇒ 7 data bit, Even parity bit, 1 stop bit
- E72 ⇒ 7 data bit, Even parity bit, 2 stop bit
- o71 ⇒ 7 data bit, Odd parity bit, 1 stop bit
- o72 ⇒ 7 data bit, Odd parity bit, 2 stop bit

3-3-4 Output Format Setting r5 1 04

4 The default setting is " For n 1 "



Use the Pcs 5 or the HR 6 key to select format mode

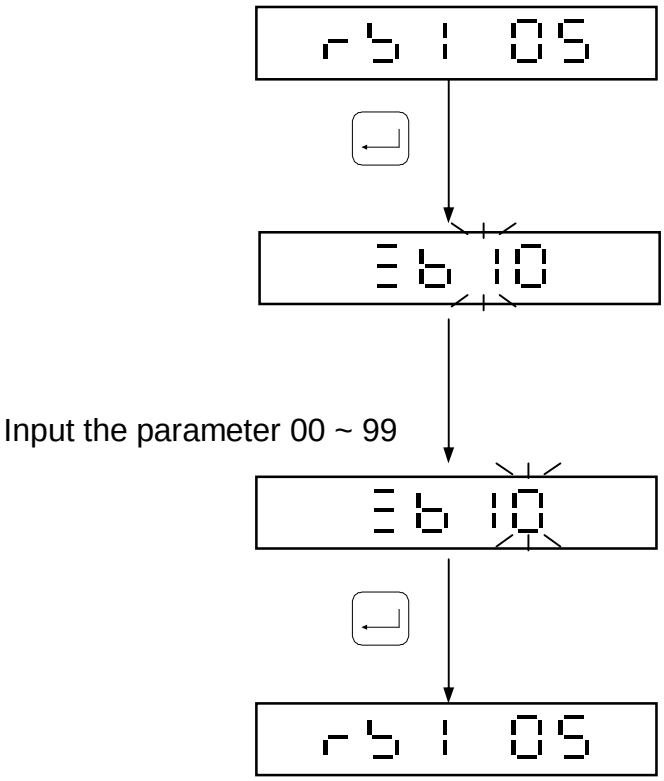
Press the ↵ key to confirm the setting.

For n 1 ⇒ Format 1
For n2 ⇒ Format 2
For n3 ⇒ Format 3
For n4 ⇒ Format 4

4 Refer to Appendix 1

3-3-5 Re-zero Range Setting r 5 1 05

- **4** The default setting:“ 10 ”
- **4** Setting range is from 00 ~ 99



5 **þ Upward digit selecting (0-9)**

6 **þ Downward digit selecting (9-0)**

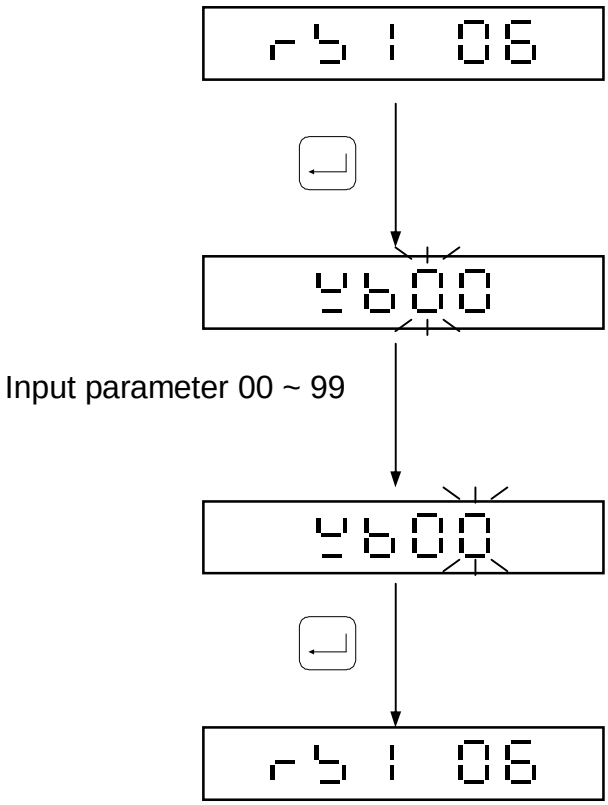
4 **þ Move the cursor rightward**

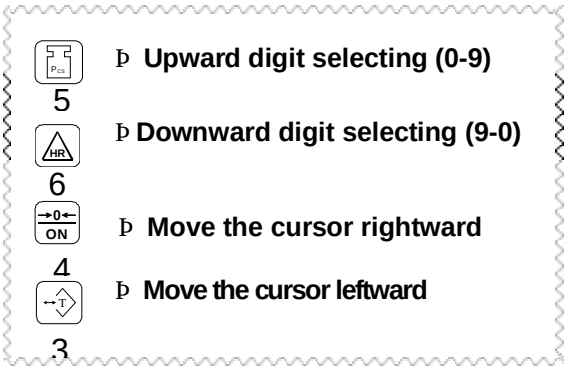
3 **þ Move the cursor leftward**

3-3-6 Weight Range Setting r51 06

- The default setting: " 00 " (The weight range change will not be defined)
- Weight Range can be set 00 ~ 99. And " 00 " is default.

  When range is over set value, and Stable Transmission or Manual Transmission Modes is set, the value will print out.



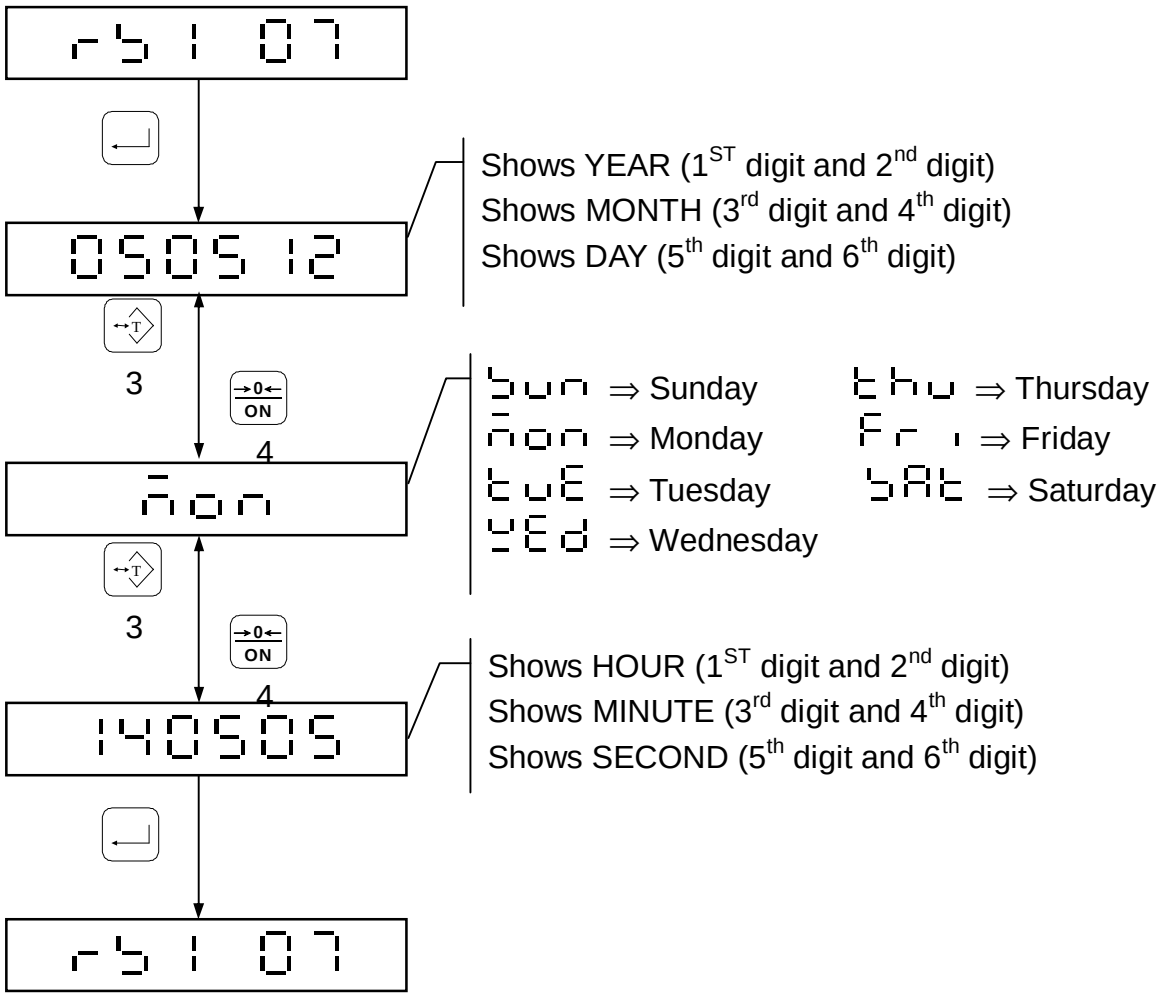


3-3-7 Date & Time Display Setting r5 I 07

- This function is available with RTC card.

Use the Pcs 5 or the HR 6 key to select DATE, TIME OR WEEKDAY in cycle.

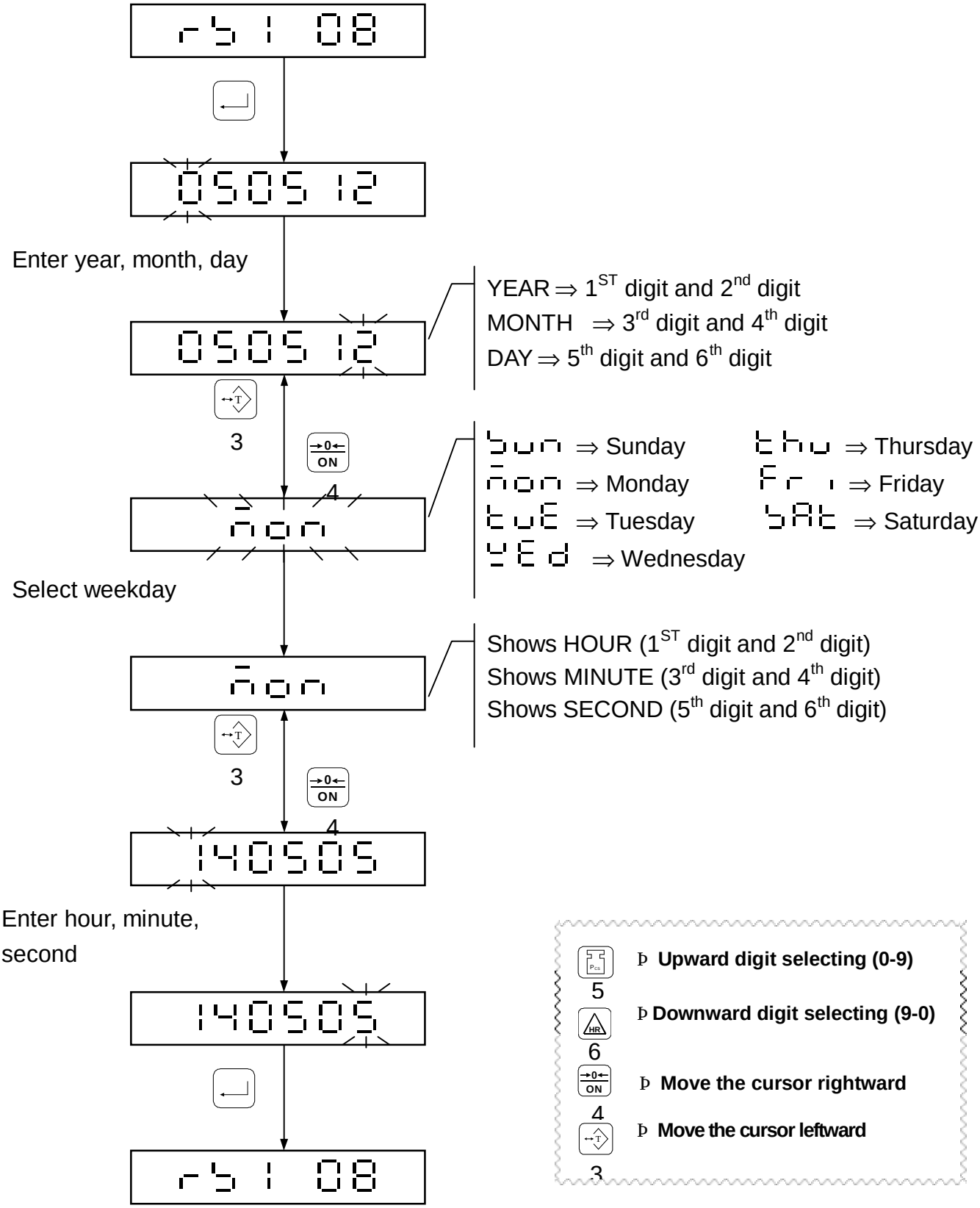
And press the ↵ key to return to the upper level.



- Without RTC card, after entering this setting mode, the display shows " 88888 ".

3-3-8 Date & Time Setting r51 08

- This function is available with RTC card.



- Without RTC card, after entering this setting mode, the display shows " 88888 ".

APPENDIX 1 UNIT CONVERSION TABLE

1	ct	[MET.CARAT]	=	0.2 g
1	lb	[AVOIRDUPOIS POUND]	=	453.59237 g
1	oz	[AVOIRDUPOIS OUNCE]	=	28.349523125 g
1	dr	[AVOIRDUPOIS DRAM]	=	1.7718451 g
1	GN	[GRAIN](U.K)	=	0.06479891 g
1	ozt	[TROY OUNCE]	=	31.1034768 g
1	dwt	[PENNYWEIGHT]	=	1.55517384 g
1	MM	[MOMME](JPN)	=	3.749996 g
1	tl.J	[HONG KONG JEWELRY TAEL]	=	37.4290018 g
1	tl.T	[TAEL](TWN)	=	37.49995 g
1	tl.H	[HONG KONG TAEL]	=	37.799375 g
1	t	[TOLA](INDIA)	=	11.6638038 g

APPENDIX 2 FULL CAPACITY TABLE

External Resolution: 1/120000 & 1/150000

		600 Series	1200 Series	3000 Series
g	Hr	600.045	1200.09	3000.18
	nr	600.45	1200.9	3001.8
ct	Hr	3000.45	6000.45	15000.9
	nr	3004.5	6004.5	15009
lb	Hr	1.32018	2.64045	6.61045
	nr	1.3218	2.6445	6.6145
oz	Hr	21.1018	42.3045	105.009
	nr	21.118	42.345	105.09
dr	Hr	338.045	670.09	1690.18
	nr	338.45	670.9	1691.8
GN	Hr	9200.9	18501.8	46204.5
	nr	9209	18518	46245
ozt	Hr	19.2018	38.5045	96.009
	nr	19.218	38.545	96.09
dwt	Hr	385.045	770.09	1920.18
	nr	385.45	770.9	1921.8
MM	Hr	160.018	320.045	800.09
	nr	160.18	320.45	800.9
tl.J	Hr	16.0018	32.0045	80.009
	nr	16.018	32.045	80.09
tl.T	Hr	16.0018	32.0045	80.009
	nr	16.018	32.045	80.09
tl.H	Hr	15.8018	31.7045	79.009
	nr	15.818	31.745	79.09
t	Hr	51.4045	102.009	257.018
	nr	51.445	102.09	257.18

APPENDIX 3 RS232 BI-DIRECTION FORMAT

General Format

Gross	S	T	,	G	S	,	+	SP	1	2	3	.	4	5	6	SP	SP	SP	g	CR	LF
Net	S	T	,	N	T	,	+	1	2	.	3	4	.	5	6	SP	SP	c	T		
Tare	S	T	,	T	R	,	+	0	1	2	.	3	4	5	6	SP	SP	k	g		
Overload	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Under load	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Unstable	U	S	,	G	S	,	+	0	1	2	3	.	4	5	6	SP	SP	l	b		

Format A

Host Command

Slave Command

MZ	Zero	CT	Clear TARE value
MT	Tare	UA	Shift to the 1st Unit
UB	Shift to the second Unit	UC	Shift to the 3rd Unit
UD	Shift to the 4th Unit	UE	Shift to the 5th Unit
UF	Shift to the 6th Unit	UG	Shift to the 7th Unit
UH	Shift to the 8th Unit	UI	Shift to the 9th Unit
UJ	Shift to the 10th Unit	UK	Shift to the 11th Unit
UL	Shift to the 12th Unit	UM	Shift to the 13th Unit
SC	Serial printer output	SA	Auto Transmission Mode
SM	Manual Transmit	SO	Command Mode
%	Stop Continuous transmission and enter the command Mode		

Format B

Host Command

Slave Data

RW	Read the current Weight	RT	Read TARE
RG	Read the Gross Weight	RN	Read Net weight value

Notes: Prior Camand plus %= Continuous read value

Prior command plus #= Read the stable value

EX:

Host	%RW	(Continuous Read)
Slave	5.185	(Continuous transmission)
Host	#RW	(Read the current weight value)
Slave	2.188	(Transmission after the balance is stable)

RS232 OUTPUT FORMAT

Format 1 (RS1 04 is set form 1)

S	T	,	G	S	,	+					0	.	0	0				g	CR	LF
HEAD1			HEAD2			SIGN									UNITS					

HEAD1 (3 byte)

S	T	,	Stable
U	S	,	Unstable
O	L	,	Overload

HEAD2 (3byte)

G	S	,	Gross Weight
N	T	,	Net Weight
T	R	,	Tare Weight

SIGN (1byte)

+	Positive weight
-	Negative weight

DATA (8byte)

								8 BYTES including the decimal point

UNITS (4byte)

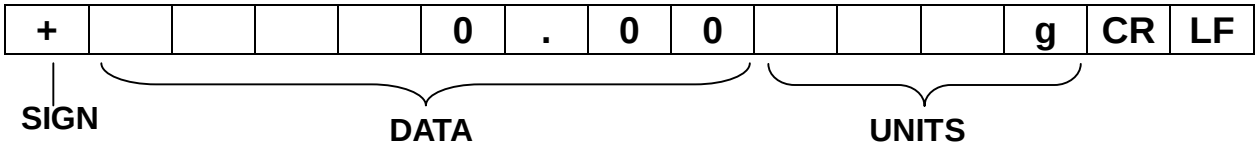
			g
		c	t
		l	b
		o	z
		d	r
		G	N
	o	z	t
	d	w	t
		M	M
t	l	.	j
t	l	.	T
t	l	.	H
			t

CR, LF (2byte)

CR	LF

4 Total length of transmission is 21 bytes (3 + 3 + 1 + 8 + 4 + 2 = 21)

Format 2 (RS1 04 is set form 2)



SIGN (1byte)

+	Positive weight
-	Negative weight

DATA (8byte)

								8 BYTES including the decimal point

UNITS(4byte)

			g
		c	t
		l	b
		o	z
		d	r
		G	N
	o	z	t
	d	w	t
		M	M
t	l	.	j
t	l	.	T
t	l	.	H
			t

CR,LF (2byte)

CR	LF

4 Total length of transmission is 15 bytes (1 + 8 + 4 + 2 = 15)

Format 3 (RS1 04 is set form 2 with option card RTC)

Weight Mode

D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G						1	0	0	.	0	0				g	CR	LF
T								0	.	0	0				g	CR	LF
N						1	0	0	.	0	0				g	CR	LF
CR	LF																
CR	LF																
CR	LF																

Counting Mode

D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G									5	0	0		p	c	s	CR	LF
T											0		p	c	s	CR	LF
N									5	0	0		p	c	s	CR	LF
CR	LF																
CR	LF																
CR	LF																

Percentage Mode

D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G						1	0	0	.	0	0				%	CR	LF
T								0	.	0	0				%	CR	LF
N						1	0	0	.	0	0				%	CR	LF
CR	LF																
CR	LF																
CR	LF																

4 Length of line is 18 bytes. (Including CR LF)

Format 4 (RS1 04 is set form 4)

Weight Mode

G						1	0	0	.	0	0				g	CR	LF
T								0	.	0	0				g	CR	LF
N						1	0	0	.	0	0				g	CR	LF
CR	LF																
CR	LF																
CR	LF																

Counting Mode

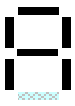
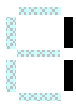
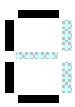
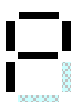
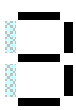
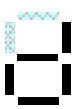
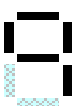
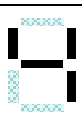
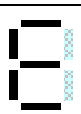
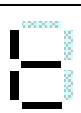
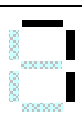
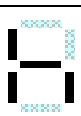
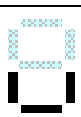
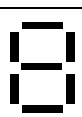
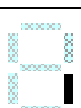
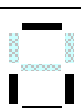
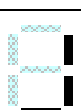
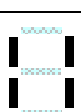
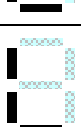
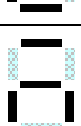
G									5	0	0		p	c	s	CR	LF
T											0		p	c	s	CR	LF
N									5	0	0		p	c	s	CR	LF
CR	LF																
CR	LF																
CR	LF																

Percentage Mode

G						1	0	0	.	0	0				%	CR	LF
T								0	.	0	0				%	CR	LF
N						1	0	0	.	0	0				%	CR	LF
CR	LF																
CR	LF																
CR	LF																

4 Length of line is 18 bytes. (Including CR LF)

APPENDIX 4 7-SEGMENT DISPLAY CHARACTERS

Digit	7 segments letter	Alphabet	7 segments letter	Alphabet	7 segments letter
0		A		N	
1		B		O	
2		C		P	
3		D		Q	
4		E		R	
5		F		S	
6		G		T	
7		H		U	
8		I		V	
9		J		W	
		K		X	
		L		Y	
		M		Z	