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EXCELL PRECISION CO., LTD.
www.excell-scale.com

Service Manual
Indicator
PWH3

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Special Notice

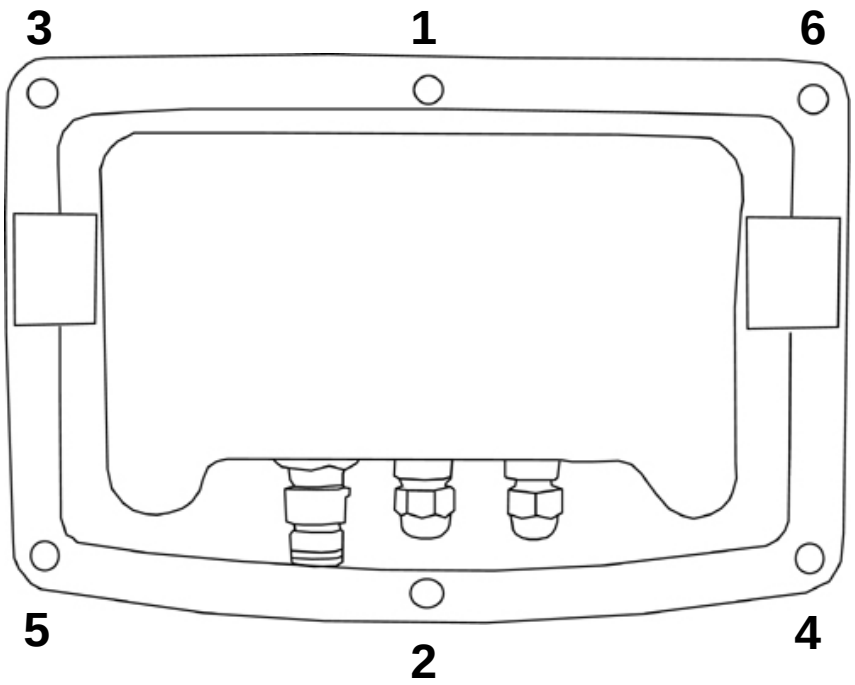
While installing the load cell, power cord hookup or replacing a new rechargeable battery, the indicator housing must be opened. It must be done by a technician assigned by your electronic indicator provider to avoid affecting the waterproof ability of this indicator. Before opening the housing, make sure the indicator is dry, if there is any liquid on it, please wipe it with a clean cloth.

HOW TO INSTALL THE HOUSING

After installing the load cell, power cord hookup or replacing a new rechargeable battery, the housing must be screwed by the assigned order as shown below. Screw lightly first, then screw them tight using a 12 kgf-cm torsion.

P.s. Please use a torsion-adjustable screw driver.

Screwing order:



Thank you for purchasing EXCELL WEIGHING INDICATOR, to help use the product properly, operate smoothly, and extend its life cycle, please read this manual carefully.

Before Using the Scale

In order to use this scale correctly, we suggest that you read this manual carefully.

Instructions for Use

1. The load placed on the weigh pan must NOT exceed the maximum weighing capacity of the scale.
2. Protect the scale from high temperatures.
3. Avoid objects impacting with the scale. Do not drop loads onto the scale or subject the weigh pan to any strong shock loads.
4. Please operate or charge the scale in an open area. Do not squeeze the power cord to avoid wire on fire.

Preparing to Use the Scale

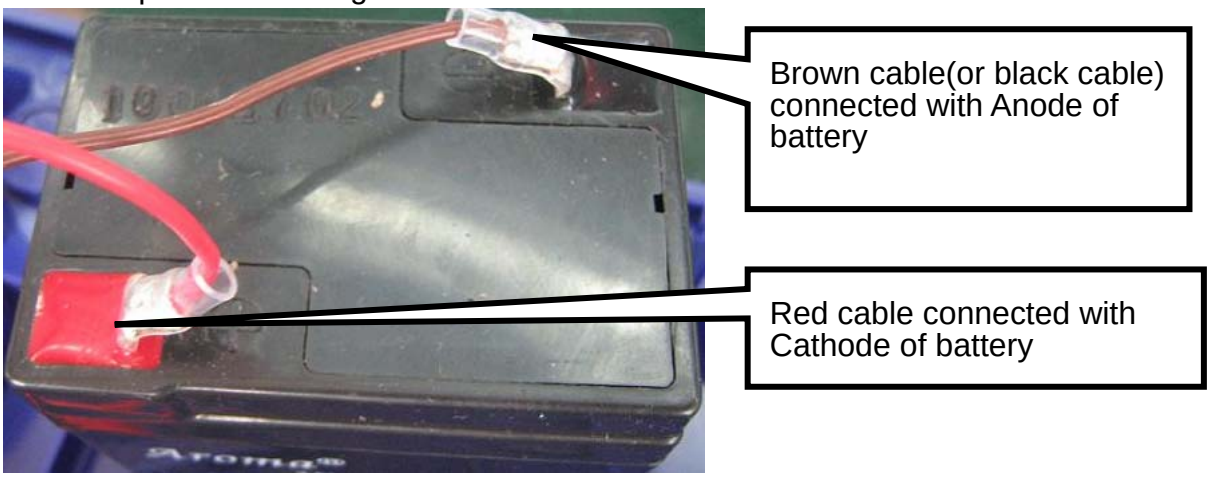
1. Locate the scale on a firm level surface free from vibrations for accurate weight readings.
2. Adjust the four levelling feet (if fitted) to set the scale pan level.
3. Avoid operating the scale in direct sunlight or drafts of any kind.
4. If possible avoid connecting the scale to ac power outlet sockets which are adjacent to other appliances to minimise the possibility of interference affecting the performance of the scale.
5. 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.
6. All goods weighed should be placed in the centre of the weigh pan for accurate weighing. The overall dimensions of the goods being weighed should not exceed the dimension of the weigh pan.
7. Once the scale has been powered on, it will go through an LCD display test and it is ready for use when the display shows zero.
8. The scale requires 15~20 minutes warm up before operation to ensure best accuracy.
9. Please note when the  symbol keeps flashing on the screen, the batteries need to be charged.
10. Introduction of Storage Battery

Due to the storage battery adopt the advanced free-maintaining technique, customers need not to replenish electrolyte.
The scale should be recharged every 3 months to prevent failure of the internal rechargeable battery.

1. The battery should be charged for 8~10 hours.
2. The temperature of battery should below 45℃.

Maintaining

1. Please do not discharge with over-current when using the battery. Please charge the battery after discharging current.
2. Please take down the battery when the scale is not used for a long time or break the connection of cathode.
3. Do not short the battery terminals to check whether there is current. Please check whether the connection point is firm to guarantee good connection.
4. The battery should be replaced by specialized person. **No reverse-battery or the product will be damaged.**
   a) Anode of battery should be connected with Anode of product battery（usually red cable）
   b) Cathode of battery should be connected with Cathode of product battery (usually brown cable or black cable)
   c) See the picture following



Safety warnings

1. The electrolyte of battery is caustic which causes metal, cotton, etc to corrode.
2. The hydrogen will be resolved when using or charging the battery and it will cause explosion when approaches fire.

No burning　Caution Corrosion　Warning explosion　Children faraway

Quick Setup Calibration

This page is to quickly initiate the scale, for the other functions configuration, you can refer the chapters below.

Instructions:

Step 1 :

- Power off the scale and open the case, find the mini-jumper SWA1 on the main board.
- Switch SWA1 to the ADJ position (EEPROM UNLOCKED) and then turn the power on. The display will show  .

Step 2 :

- Refer to the chapter 4-1 at page 40 to complete Capacity Setup.

Step 3 :

- Refer to the chapter 4-2 at page 51 to complete Linearity Calibration.

Step 4 :

- Refer to the chapter 4-3 at page 54 to complete Weight Calibration.

Step 5 :

- When done the initiation, switch the jumper SWA1 back to the LOCK position.

If the jumper SWA1 is switched to the LOCK position during calibration, the machine will exit the service mode automatically.

Chapter 1 Introduction

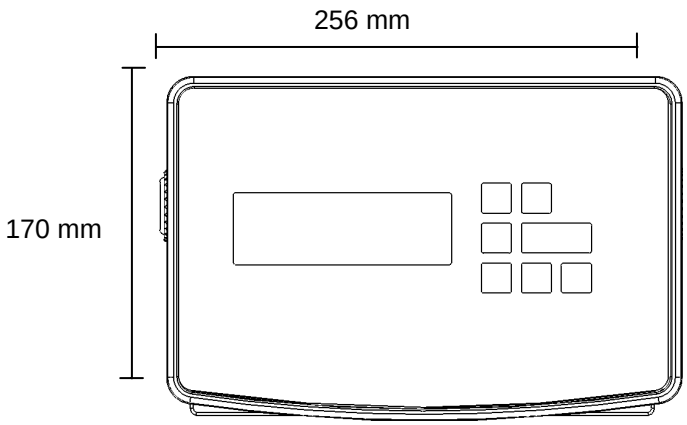
1-1 Product Features

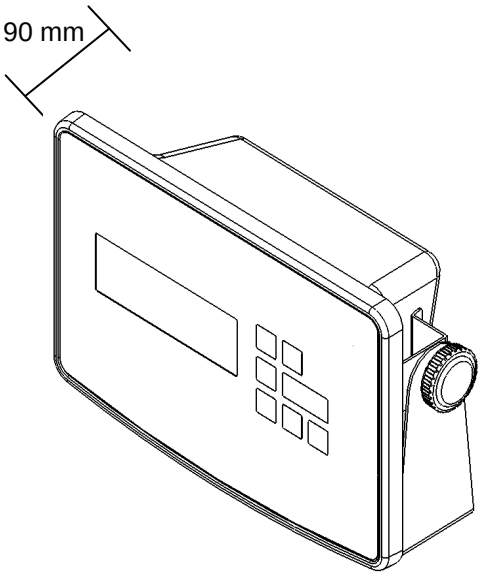
- Sealed to IP68, (Only use cables of 3mm~5mm diameter to ensure correct sealing of the cable glands)
- Kilogram (kg) and pound (lb) weighing modes
- Full range tare; Pre-tare; Auto zero tracking; Sampling counting; Gross/Net indication
- Adjustable gravity value
- Low power indication and auto power off
- AC/DC power in and rechargeable battery.
- Built-in RS-232
- Options: pressure release valve, foot switch

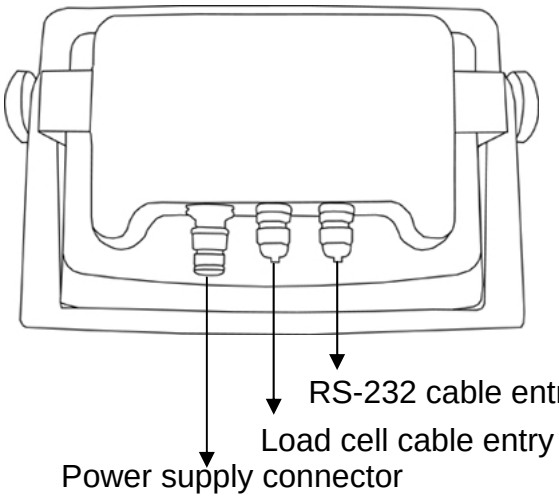
1-2 Specifications

- Analogue Input: Input Sensitivity 0.3μ V/d (Min.)
- Input Signal Range: -1mV~+14mV
- Input Zero Range: -1mV~+5mV
- Load Cell Excitation: 5V DC
- Load Cell Drive Capacity: Up to 8 x 350Ω load cells
- Non-linearity: 0.01% of full scale
- A/D Resolution: 500,000 counts (Maximum)
- Operating temperature: -10℃ ~ 40℃

1-3 Product Appearance

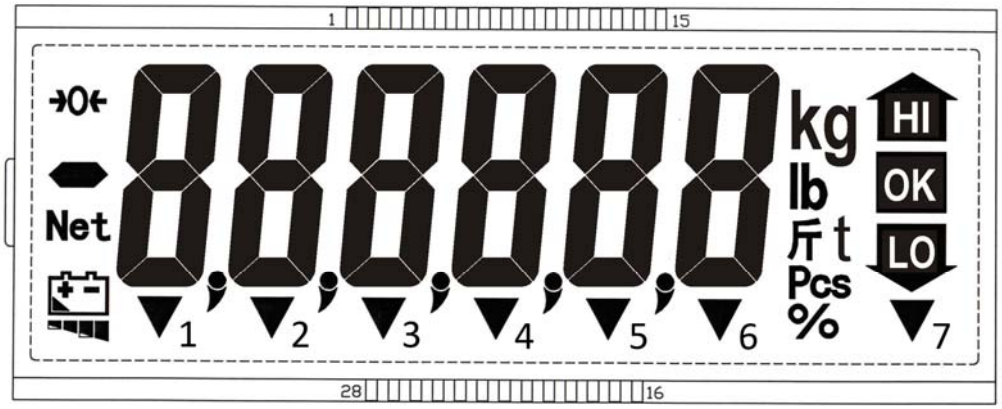






(RS-232 and load cell cables size 3mm~5.5mm diameter to ensure correct sealing of the cable glands)

1-4 Display Description



HI	:	Upper limit
OK	:	Value between HI and LO
LO	:	Lower limit
kg	:	Unit “kilogram”
lb	:	Unit “pound”
t	:	hk tael
Pcs	:	Counting mode indication
→0←	:	Zero point indication
Net	:	Net weight indication
	:	Low Power indication

Non-approval model: “▼” indications description

▼**1**	:	(STABLE) stable indication
▼**2**	:	(GROSS) gross weight indication
▼**3**	:	(Pcs) unit weight insufficient indication
▼**4**	:	(PT) pre-tare indication
▼**5**	:	(Hold) weight hold indication
▼**6**	:	“GN”、“dwt”、 “carat” 、”M+” unit indication
▼**7**	:	“oz” or “viss” unit indication (set as needed), or no unit indication

Approval model: “▼” indications description:

▼**1**	:	(STABLE) stable indication
▼**2**	:	(GROSS) gross weight indication
▼**3**	:	(Pcs) unit weight insufficient indication
▼**4**	:	(PT) pre-tare indication
▼**5**	:	Range 2
▼**6**	:	Range 1
▼**7**	:	M+

1-5 Power Supply

Power Supply Selection

① 6V / 4.5Ah rechargeable battery

② Input 110VAC or 230VAC ±15% ; Output 10VDC/1A adaptor

Power Consumption

Approximately DC 14 mA (Indicator)
Approximately DC 24 mA (Indicator + Display backlight)

Charging Voltage

DC 10V/1A output adaptor

Low Battery Warning

Please note when the () symbol keeps flashing on the display, the internal battery should be recharged.

- The scale will turn off automatically after a few hours when the low battery warning symbol shows up. The scale must be fully charged, before operating again.
- When the battery status indication is full, the power is about 6.1V; Each block is about 0.2V; When the battery warning symbol shows up, the power is about 5.4V.

1-6 Keypad Function

OFF KEY

Press the OFF key to switch the indicator off.

ON|ZERO KEY

❶ When the power is off, press ON|ZERO key to switch the indicator on.

❷ When the power is on, press ON|ZERO key to return to zero.

- Zero Range : OIML&NTEP is ±2% F.S., and Sri Lanka is ±3% F.S.

TARE|PT KEY: Tare / Pre-tare key

To TARE:

Place the container onto the scale, until the weight value is stable, press TARE|PT key for zero return and the NET indication is shown on the display. Place the object onto the container and the display shows the net weight value of the object. Remove both object and container, and negative value of the container will show on the display. Press TARE|PT key again to clear “tare value”. The scale returns to zero and NET indication goes off.

- Tare can be continuously done until tare value=full load capacity
- Continuous Tare → Press TARE|PT key for continuous weight increase/decrease on platter.
- If there is Tare, the pre-tare cannot be done. If there is pre-tare first, and the tare weight more than pre-tare weight, Tare can be done.
- No Tare can be done under gross weight display mode.

To PRE-TARE:

Press TARE|PT key, use keypad to input pre-tare weight. When the cursor flashes on the rightmost digit, press TARE|PT key again to complete.

Pre-tare mode, keypad function as followed:

ON|ZERO	⇒ upward key (0~9 digit entry)	NET|GROSS	⇒ move cursor leftward
UNIT	⇒ downward key (0~9 digit entry)	TARE|PT	⇒ move cursor rightward

UNIT KEY

Press the UNIT key to switch weight units; the display icons will indicate the active units.

NET|GROSS KEY (Non-approval models. For approval models, use NET|B/G key instead)

In the Tare mode, the screen displays the "TARE" icon; press the NET|GROSS key to switch between the "Net value" and the "Gross value". When the "GROSS" arrow ▼ shows up, the Gross Weight in the screen = Tare weight + Net weight, meanwhile, keys except the NET|GROSS key, have no response.

M+|PRINT KEY

Totalization function. M+/Print function is available when RS232 is on keypad transmission mode. (r5 104 output).

This key is a composite key, while totalization is shown and weight returns to net zero, press M+ key to erase memory. RS232 will output MC print format (r5 103 output).

- If there is new weight added on platter（it is less than 20 divisions in Brazil version, no accumulation ）, a new item will be added to totalization. If this weight is not taken off, nothing can be added to totalization.Display will show the totalization numbers for one second, then show net weight for one second, then the scale returns to the current weight, and prints out the last item for totalization.
- To clear totalization data, press M+ key to let display shows up totalization numbers, then press the M+|PRINT key again, to clear totalization data. RS232 will print out totalization numbers, total weight, etc.
  P.s. Weight must return to net zero if to perform clear function.

F KEY (Non approval models. For approval models, use F/HR key instead)

Function key (In FnC 12, select F key as "MC" or "HR")

Foot Switch Mode

This function is optional. Use FnC 11 to select TARE|PT key as "ZERO" or "PRINT" key

- If "PRINT" key is set (r5 103 = 10/11), all totalization data will be printed out, and totalization will be cleared.
- If it is Brazil version and foot switch is set as Print function, it has totalization function and print function.

Simple Counting Mode

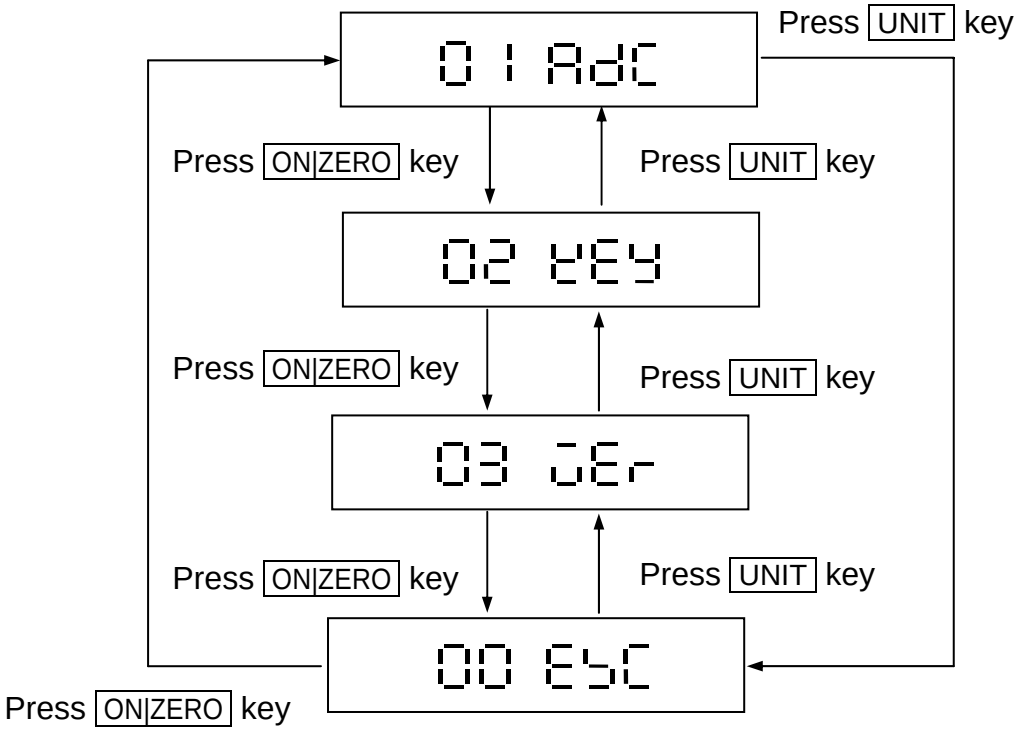
Use UNIT key to switch unit to Pcs, to go into simple counting mode.

1. Use NET|GROSS key (For approval models, use NET|B/G key instead), to select a sample number from "10, 20, 50, 100, or 200". Display will show C 10, C 20, C 50, C 100, C 200 in an sequential order by pressing NET|GROSS key (For approval models, use NET|B/G key instead).
2. Select a sampling number, and put appropriate weight on platter, and press UNIT key. Display will show "– – – – – –". The scale will go into counting mode after weight is stable, and display will show the sample number.

- Unit weight insufficient (Pcs↑): Sample unit weight is ***less*** than 0.2d or total sample weight is ***less*** than 20d (d=division)
- While sampling, if there is insufficient sample or unit weight insufficient indication "▼", the scale is still usable, but there may be slight inaccuracy.
- After Power-off, the scale automatically memorizes the sampling number, and it is available when "Pcs" unit is selected next time.
- If the setting is "automatic average unit weight ", if the object on platter > the previous sampling number more than 5 pcs, and also < less than 100% the previous sampling number, the scale will execute unit weight calibration automatically.

1-7 Self-Test Mode

When power is off, hold NET|GROSS key (For approval models, use NET|B/G key instead), and press ON|ZERO key, Wait till display shows 01 AdC to enter “Self-Test Mode”.



01 AdC INTERNAL VALUE MODE (must hook up full-bridge Load Cell to test)

① Press TARE|PT key to enter, and the display shows internal value
② Please check the internal value is within normal range is 0 ~ 400000 (no load)
③ Check whether the backlight is on
④ Press ON|ZERO key to back to the last screen, the display shows 01 AdC

02 KEY KEYPAD TEST MODE

① Press TARE|PT key to enter, display shows KEY 06
Keypad’s internal code: TARE|PT key = 06, UNIT key= 05, F key = 02
NET|B/G or NET|GROSS key=04
② Press ON|ZERO key to back to the last screen , the display shows 02 KEY

03 SEr FIRMWARE VERSION DISPLAY MODE

① Press TARE|PT key to enter , display shows the firmware version 02005 ,
② Press TARE|PT key again, the display shows maintenance number 158 for 2 seconds
③ Press ON|ZERO key to back to the last screen, display shows 03 SEr

00 ESC BACK TO THE LAST SCREEN

Press TARE|PT key to exit self-test mode, the scale will re-power on automatically.

1-8 Error Messages

E0 ⇒ The EEPROM is not working correctly.
The EEPROM is not set yet, or the circuit on PCB is broken.

E 1 ⇒ Zero is higher than the zero range when switching the indicator on.

E2 ⇒ Zero is lower than the zero range when switching the indicator on.

E4 ⇒ A/D value is unstable.

oL ⇒ The weight of the object is over 9 divisions of the maximum capacity .

-oL ⇒ The weight of the object is under -1/6 maximum capacity.

oF ⇒ ADIC value is over the maximum range.

E 10 ⇒ The scale is not in level status.
(Only available with level detector equipped)

Level Switch Function (Option)
Make J14 through circuit and the display will show " E 10 ", while all keys stop working in the mean time. On the other hand, make J14 short circuit to make all functions start working.
When the mercury switch of the scale is in level and stable condition, it will transmit a close circuit signal CN6 to make all functions work properly. On the other hand, when the mercury switch is not level (is tilted), it will transmit a through circuit to CN6 to make the display show " E 10 ", all keys stop working.

1-9 Weight Units

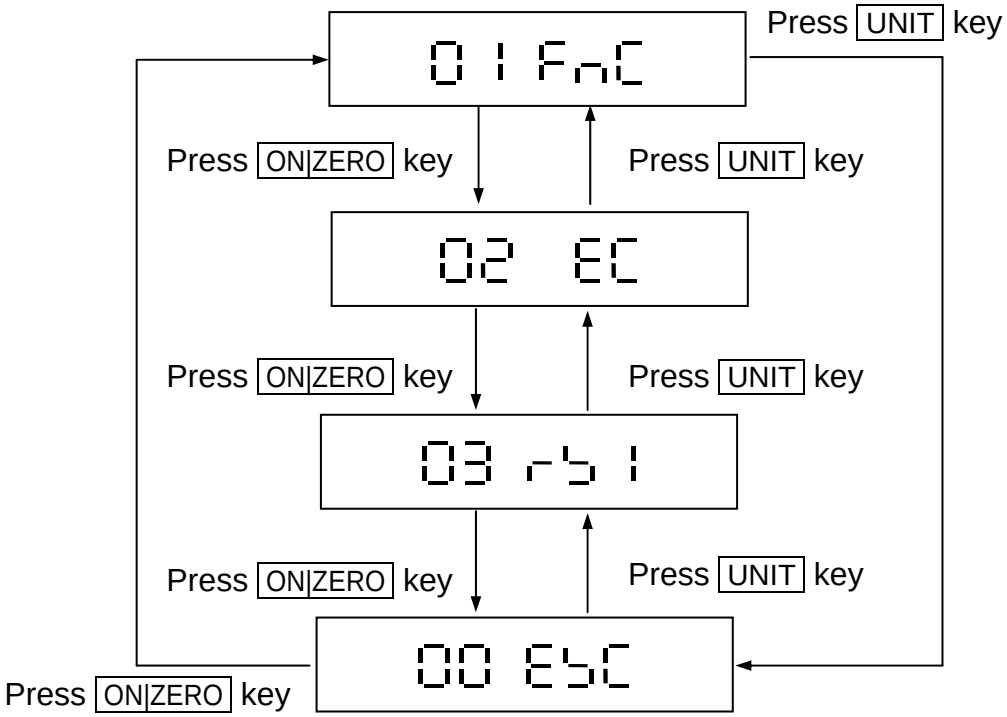
kg	1 g = 0.001 kg
g	1 g = 1 g
lb	1 g = 0.002204623 lb
lb/oz	1 g = 0.03527396 oz
oz	1 g = 0.03527396 oz
GN	1 g = 15.432358 GN
dwt	1 g = 0.6430149 dwt
ct	1 g = 5 ct
hk.tael	1 g = 0.02645546 Hk.catty
viss	1kg = 0.612245 viss

Chapter 2 Configurations

Configuration Workflow

In the weighing mode, press NET|GROSS key (For approval models, use NET|B/G key instead) and ON|ZERO key s at the same time to enter the configuration mode.
The LCD shows 01 FnC.

Overall workflow of the Advanced Function setting mode:

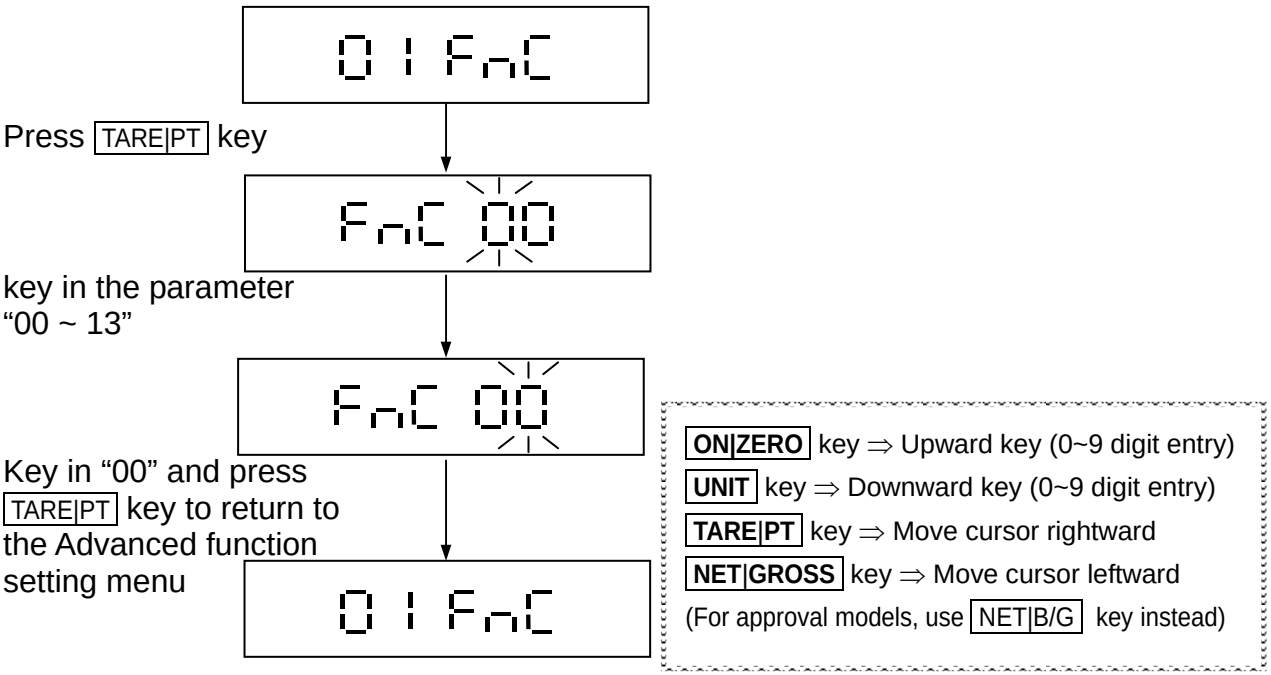


01 FnC	⇒ General Function Setting Mode
02 EC	⇒ External Weight Calibration
03 rS1	⇒ RS232 Bi-direction Function Setting
00 EsC	⇒ Exit the Advanced Function Setting Mode

Refer to the following sections for the detailed operation procedures of each function setting.

2-1 General Function Setting 01 FnC

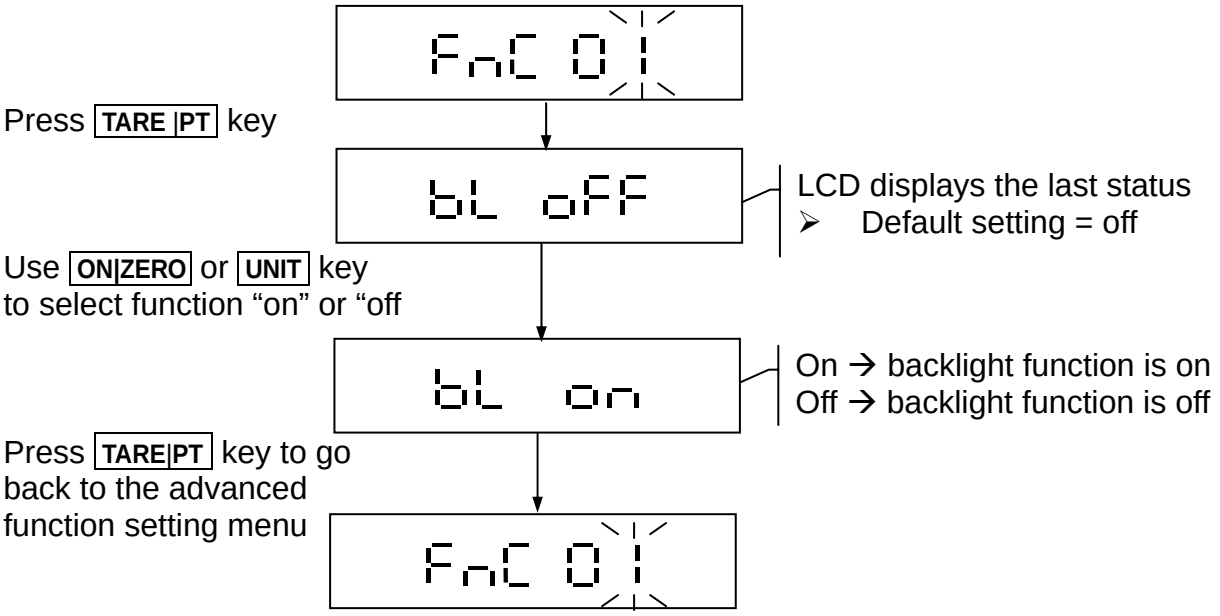
Workflow of the General Function setting:



FnC 00 ⇒ Return to the Advanced Function Setting Mode Menu
FnC 01 ⇒ Automatic Backlight Function Settings
FnC 02 ⇒ Automatic Power-off Timer Settings
FnC 03 ⇒ Hi/Lo/OK Settings
FnC 04 ⇒ Restore the Default Settings
FnC 05 ⇒ Noise Filter Settings
FnC 06 ⇒ Hold Function Settings
FnC 07 ⇒ Auto Unit Weight Averaging Setting
FnC 08 ⇒ Reserved
FnC 09 ⇒ Reserved
FnC 10 ⇒ Record Last Zero
FnC 11 ⇒ Foot switch on/off settings (Option)
FnC 12 ⇒ F key function settings
FnC 13 ⇒ Zero Setting

2-1-1 Auto Backlight Function Setting FnC 01

Select FnC 01 in the general function setting mode 01 FnC to change the backlight function setting.



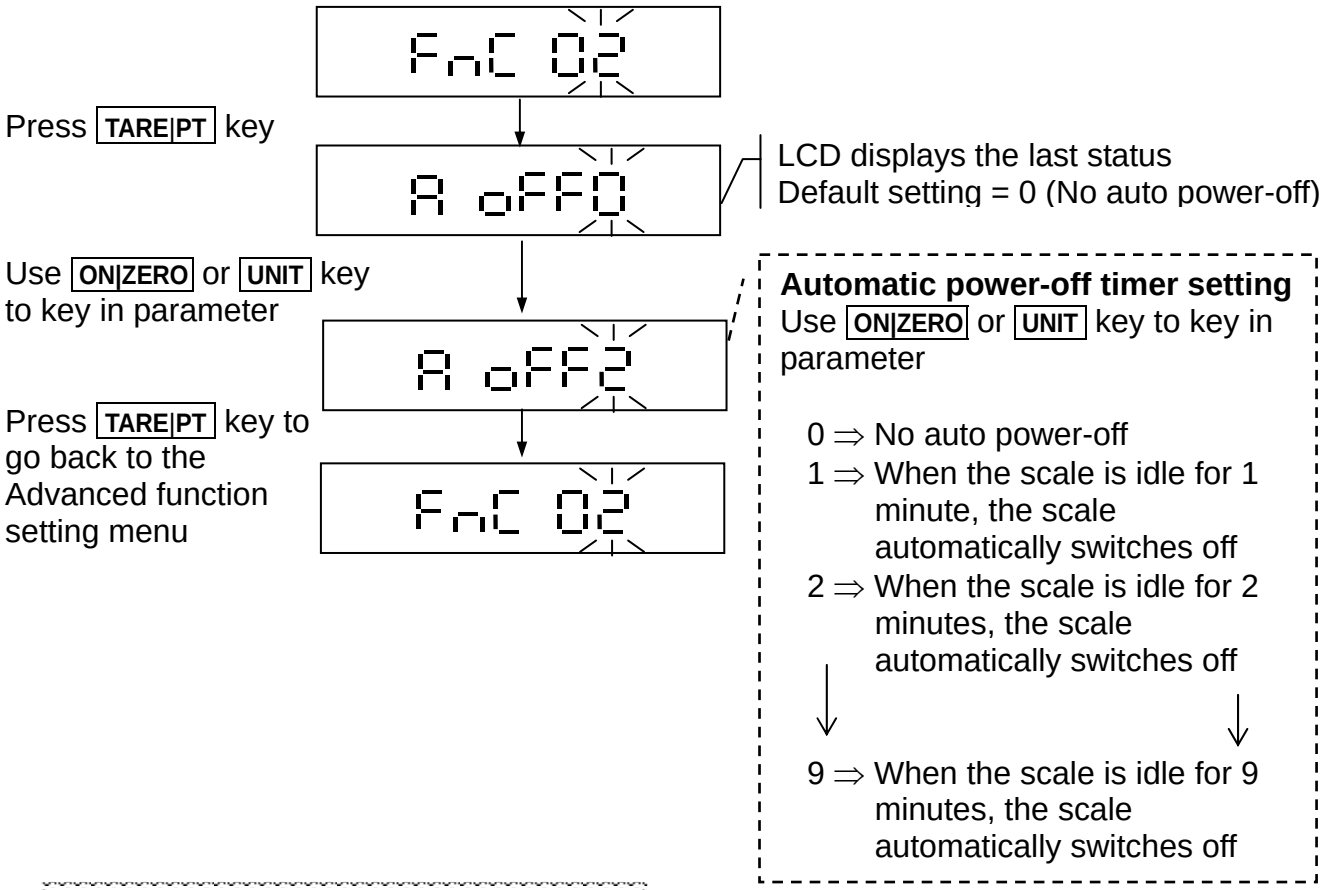
ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

Auto backlight function

When the weight is over 10d, the display backlight will be on. After the weight is stable for 10 seconds or when the scale returns to zero, the display backlight switches off.

2-1-2 Auto Power-off Timer Setting FnC 02

Select FnC 02 in the general function setting mode 0 | FnC to change the automatic power-off timer setting.



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

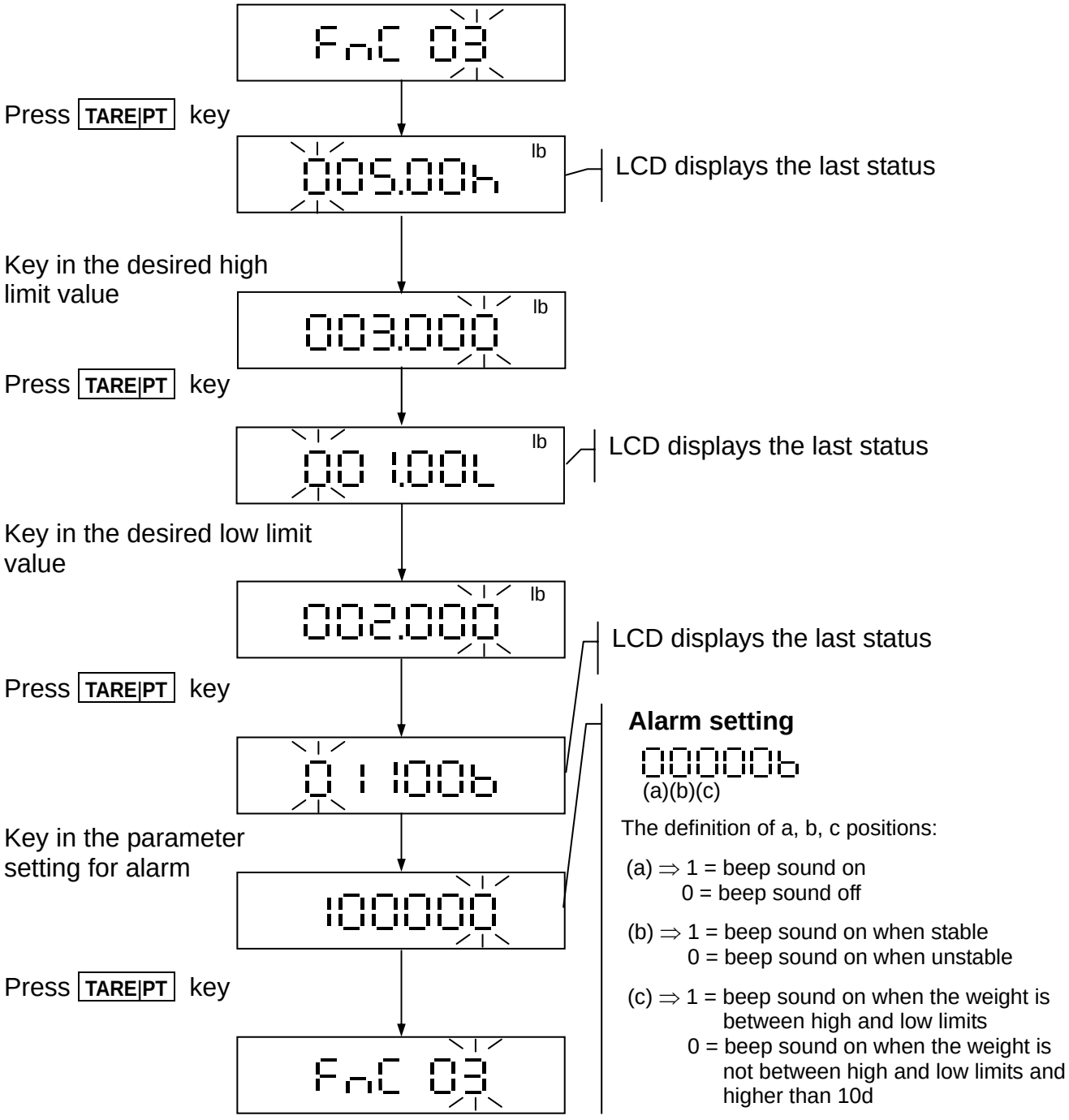
Auto power-off function

When the weight on weigh pan is less than 10d or keeps idle for the set time, the scale will automatically switch off.

2-1-3 HI/LO/OK Settings FnC 03

Select FnC 03 in the general function setting mode 01 FnC to set the HI/LO/OK function.

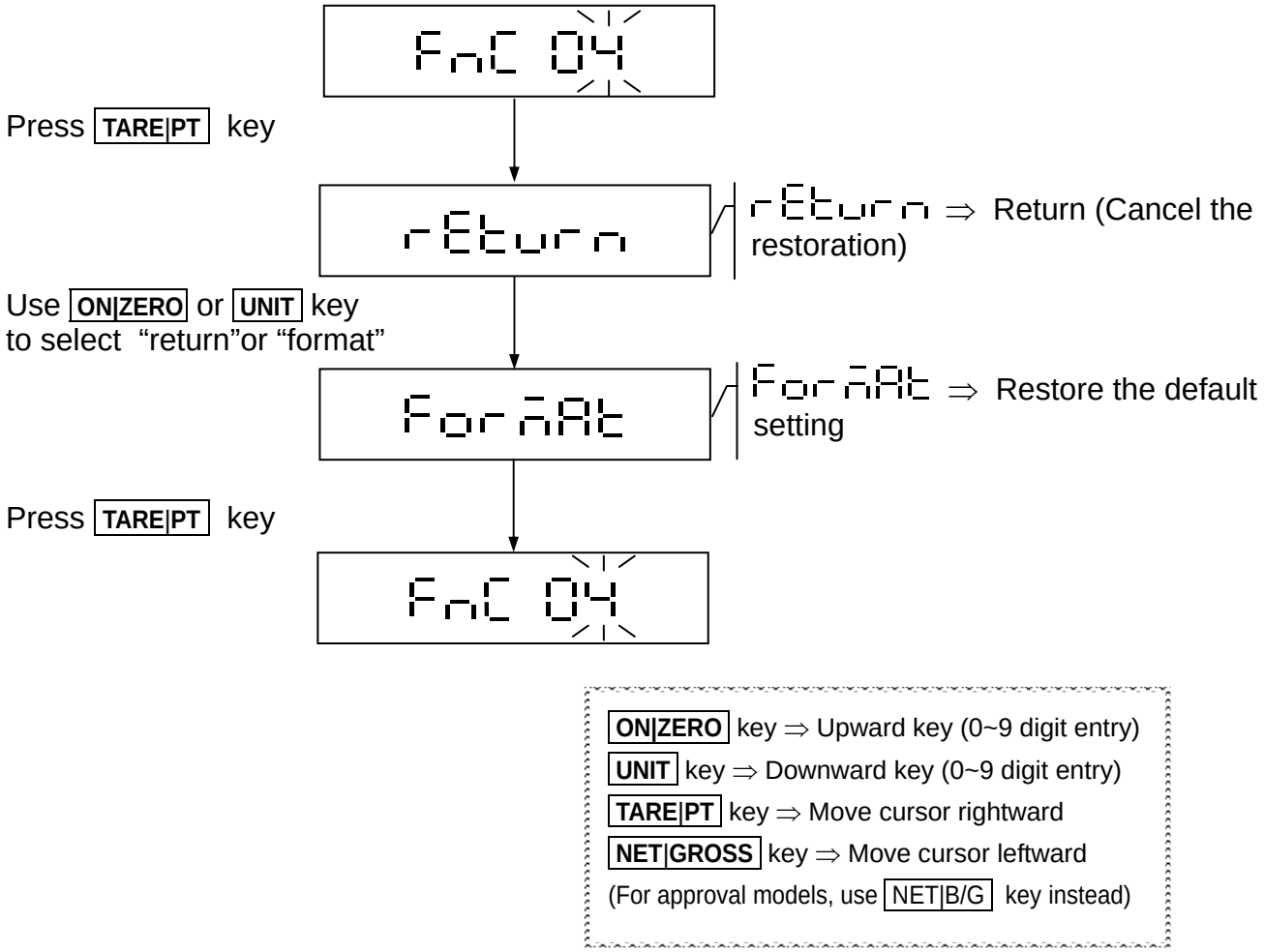
When the high limit and low limit are both set as “0”, the Hi/Lo/OK function is disabled.



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

2-1-4 Restore to the Default Settings FnC 04

Select FnC 04 in the general function setting mode 01 FnC to restore to the default settings.



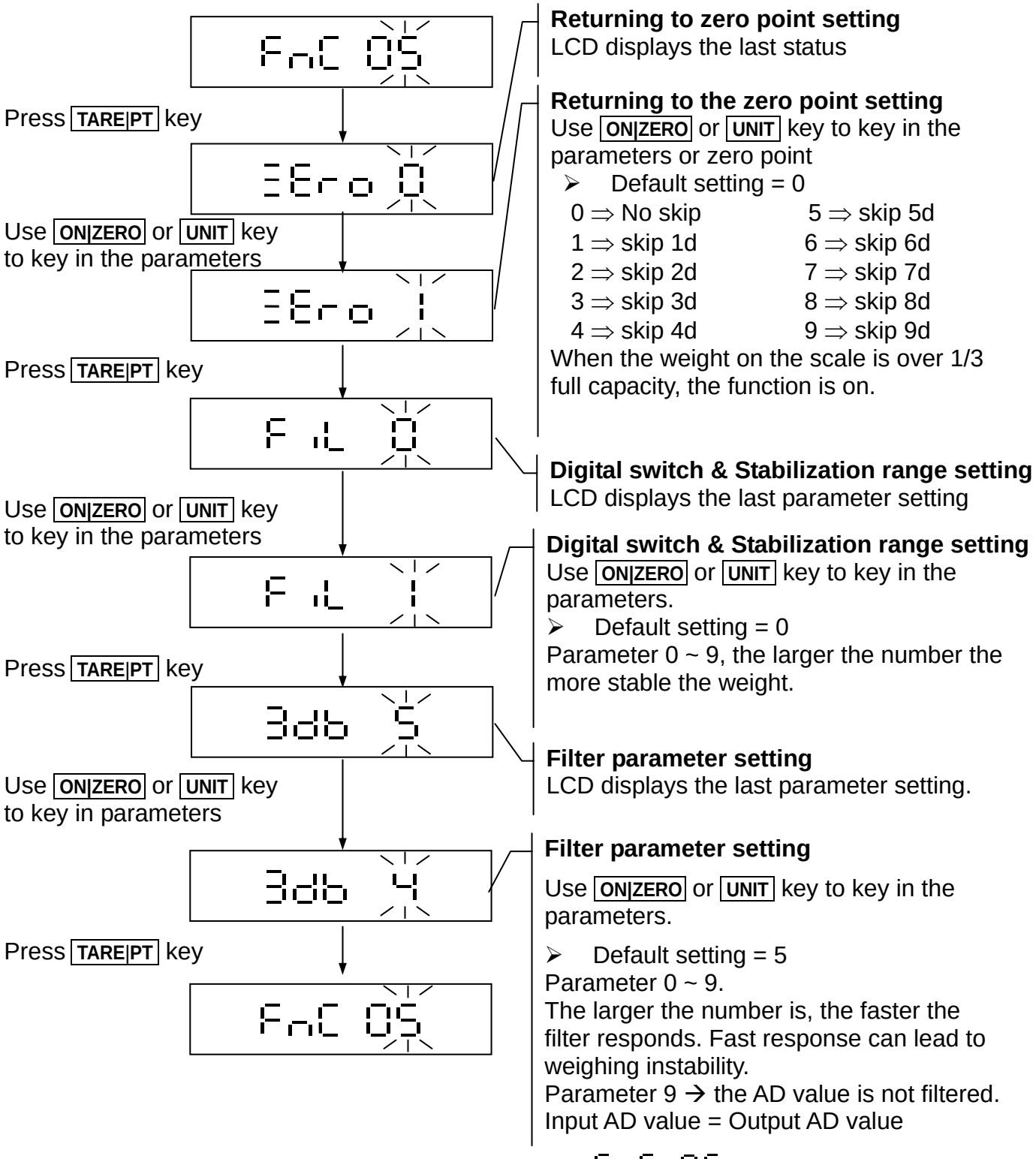
- The defaults are included the following:
  1) External weight calibration
  2) HI/LO/OK setting values
  3) Noise filter setting (External)
  4) Sampling settings for the counting function

- Approval model does not have the setup access for FnC 04

2-1-5 Noise Filter Settings FnC 05

Select FnC 05 in the general function setting mode 01 FnC to set the noise filter settings.

When modifying FnC 05, the parameters of CFn 01 remain un-altered.



Returning to zero point setting
LCD displays the last status

Returning to the zero point setting
Use ON|ZERO or UNIT key to key in the parameters or zero point

- Default setting = 0

0 ⇒ No skip	5 ⇒ skip 5d
1 ⇒ skip 1d	6 ⇒ skip 6d
2 ⇒ skip 2d	7 ⇒ skip 7d
3 ⇒ skip 3d	8 ⇒ skip 8d
4 ⇒ skip 4d	9 ⇒ skip 9d

When the weight on the scale is over 1/3 full capacity, the function is on.

Digital switch & Stabilization range setting
LCD displays the last parameter setting

Digital switch & Stabilization range setting
Use ON|ZERO or UNIT key to key in the parameters.

- Default setting = 0

Parameter 0 ~ 9, the larger the number the more stable the weight.

Filter parameter setting
LCD displays the last parameter setting.

Filter parameter setting
Use ON|ZERO or UNIT key to key in the parameters.

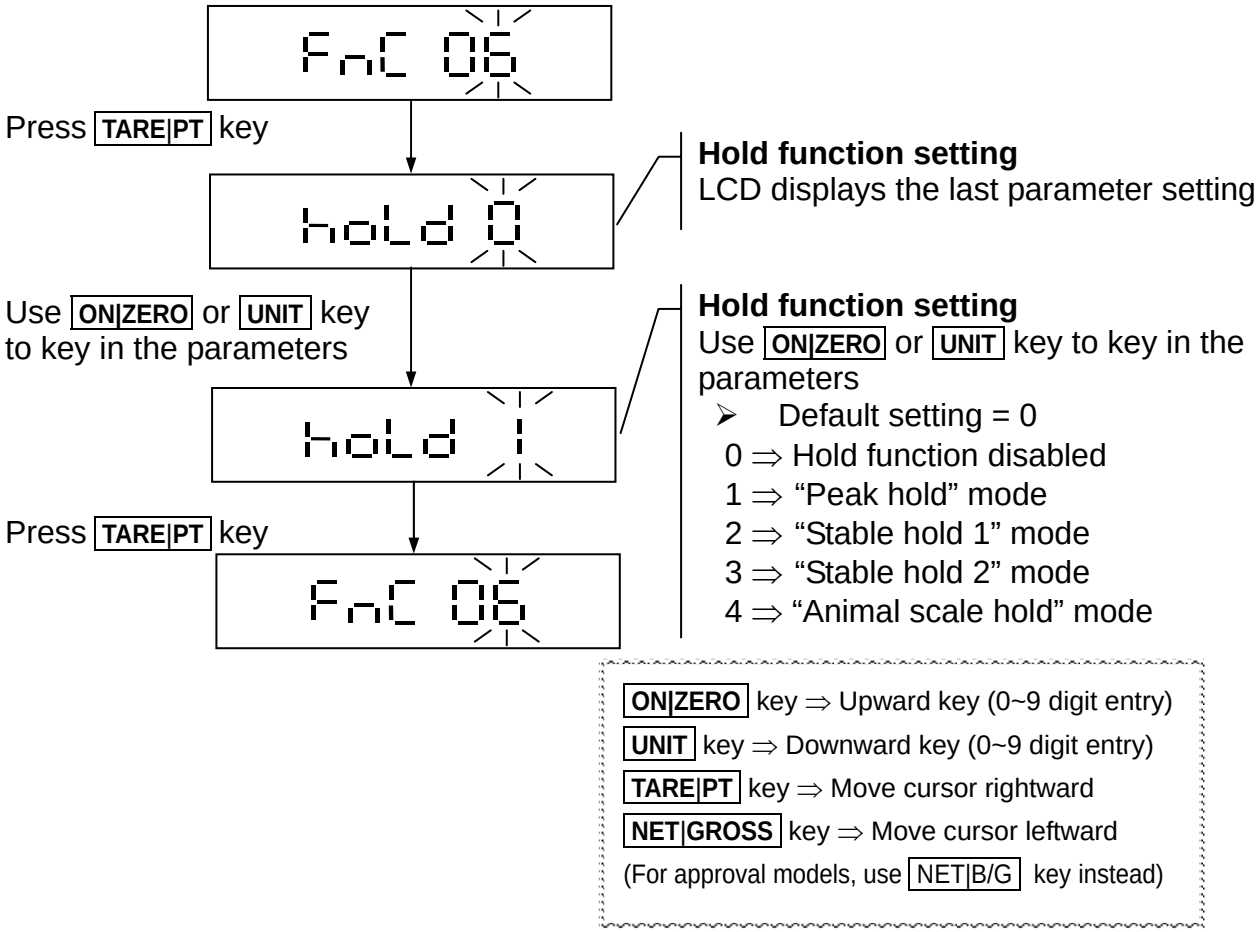
- Default setting = 5

Parameter 0 ~ 9.
The larger the number is, the faster the filter responds. Fast response can lead to weighing instability.
Parameter 9 → the AD value is not filtered.
Input AD value = Output AD value

Approval model does not have the setup access for FnC 05

2-1-6 Hold Function Settings FnC 06

When CFn 02 =1 (OIML or NTEP approval), FnC 06 setting cannot be changed, and hold=0



hold0 = Hold function disabled

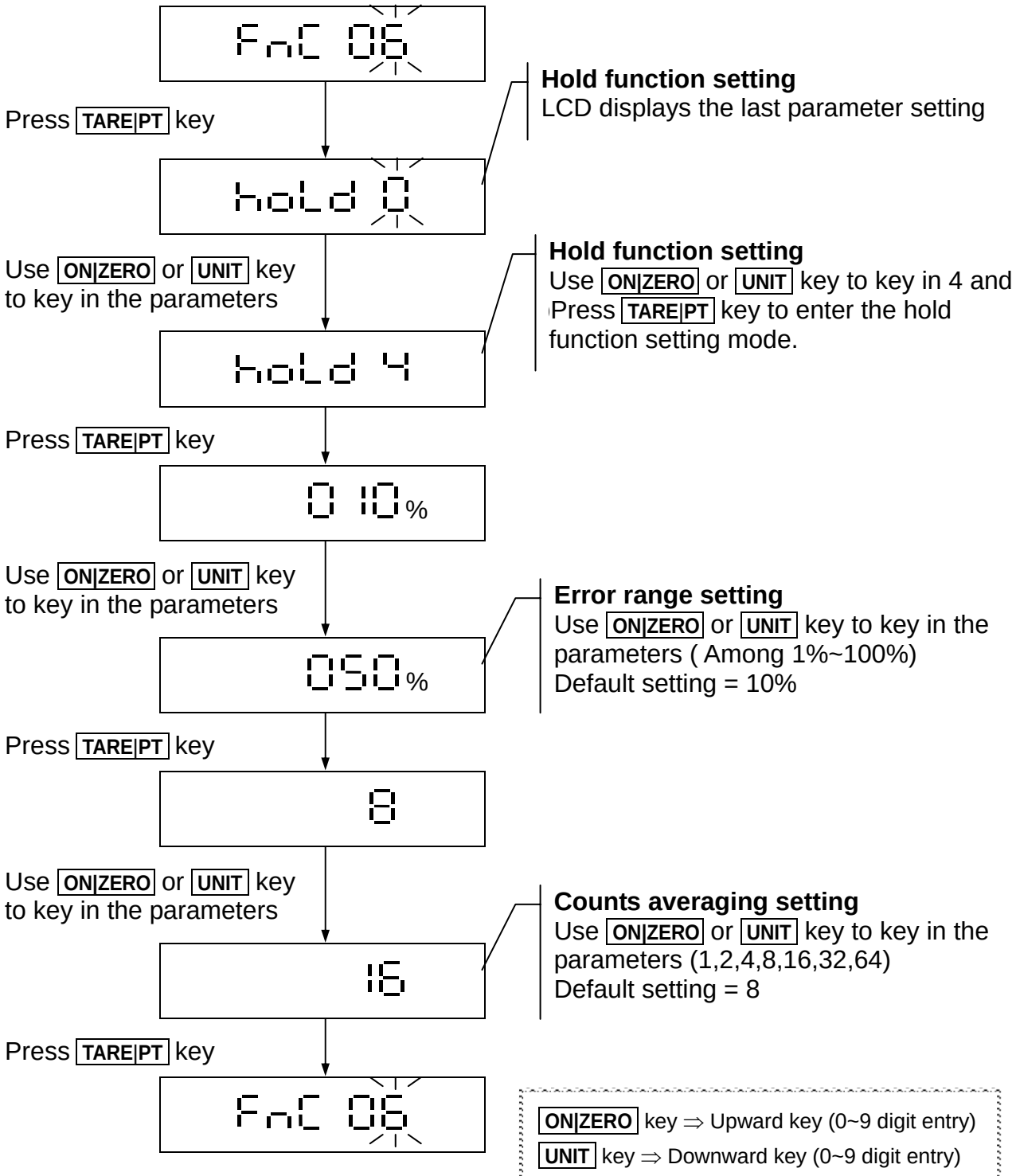
hold 1 = "Peak hold" mode
The scale keeps displaying the maximum weight when the weight is continually changing. Press any key to exit this mode.

hold2 = "Stable hold 1" mode
When the weight is stable, the LCD shows the current weight value. Press any key to exit this mode.

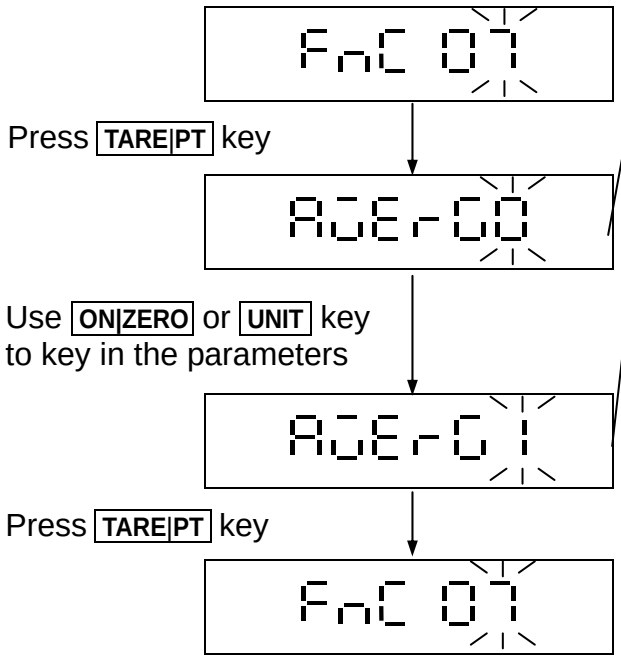
hold3 = "Stable hold 2" mode
When the weight is stable, the LCD shows the current weight value. When the weight returns to zero (<10d), the hold mode is cancelled automatically.

hold4 = "Animal scale hold" mode
When the scale returns back to zero, the display shows " - - - - - - ". After the animal or object is on the platter and the scale becomes stable, the display shows the weight value and hold. Then when the animal or object is off the platter, the display shows " - - - - - - " (or the weight is less than 10e) and the hold function is off. If the scale is hardly stable when the animal is on the platter, the scale shows the average weight in 10 seconds and holds the status.

Hold Function Setting (Animal scale) hoLd 4



2-1-7 Auto Unit Weight Averaging Setting FnC 07



Auto unit weight averaging setting
LCD displays the last parameter setting

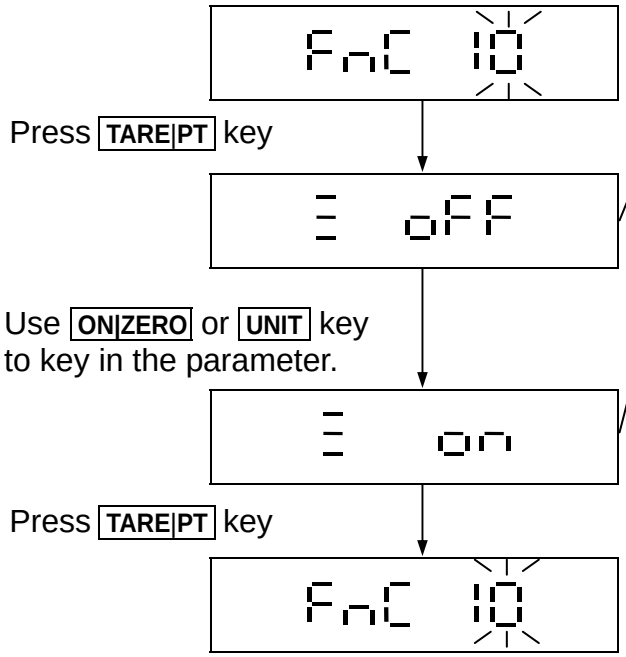
Auto unit weight averaging setting
Use ON|ZERO or UNIT key to key in the parameters

- Default setting = 0

0 ⇒ Auto unit weight averaging
1 ⇒ Non auto unit weight averaging

ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

2-1-8 Record Last Zero FnC 10



LCD displays the last parameter setting

Record Last Zero

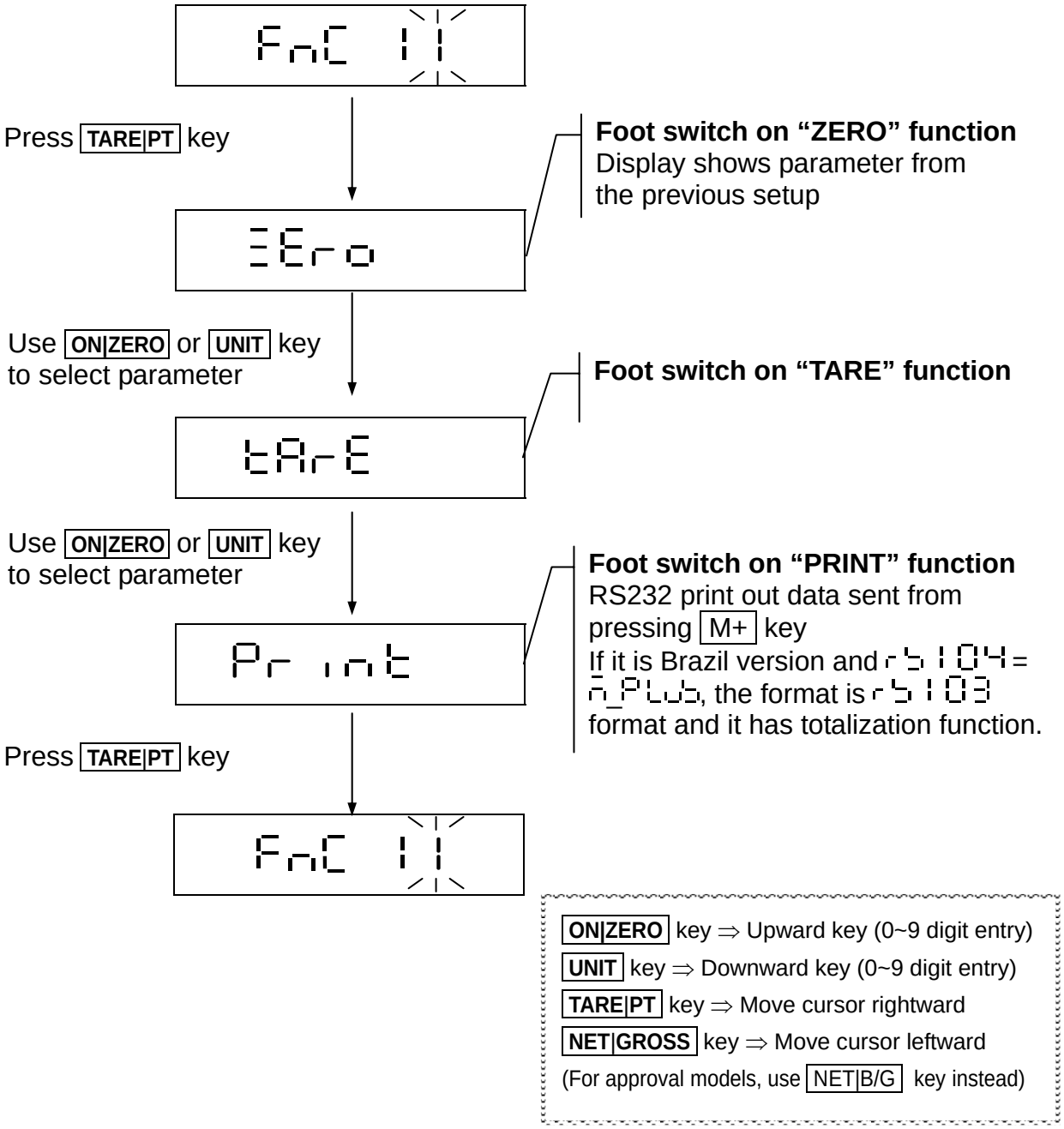
Use ON|ZERO or UNIT key to select the setting
Default setting = oFF

E on ⇒ Record the last zero setting
E oFF ⇒ No record

ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

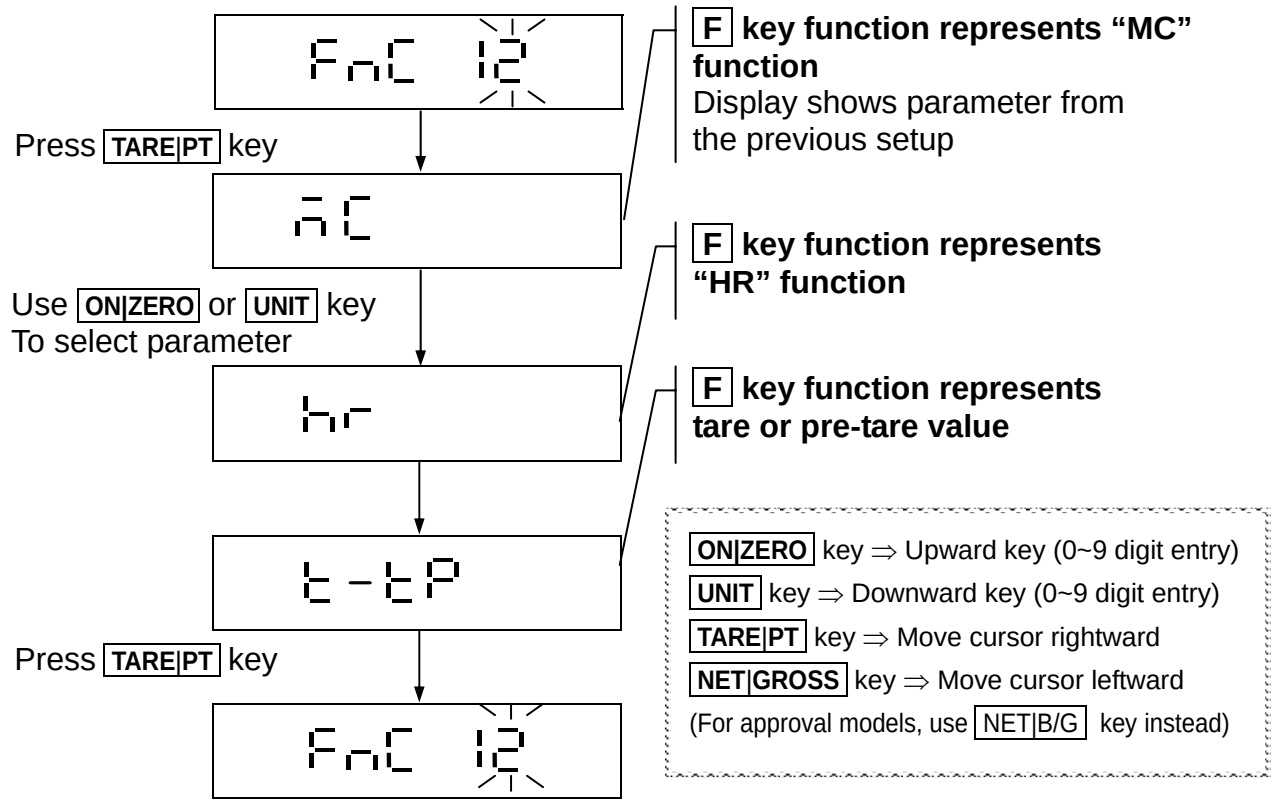
FnC 10 is only for non-approval model with CFn 02 parameter setting.

2-1-9 Foot Switch Settings FnC 1 1 (Option)

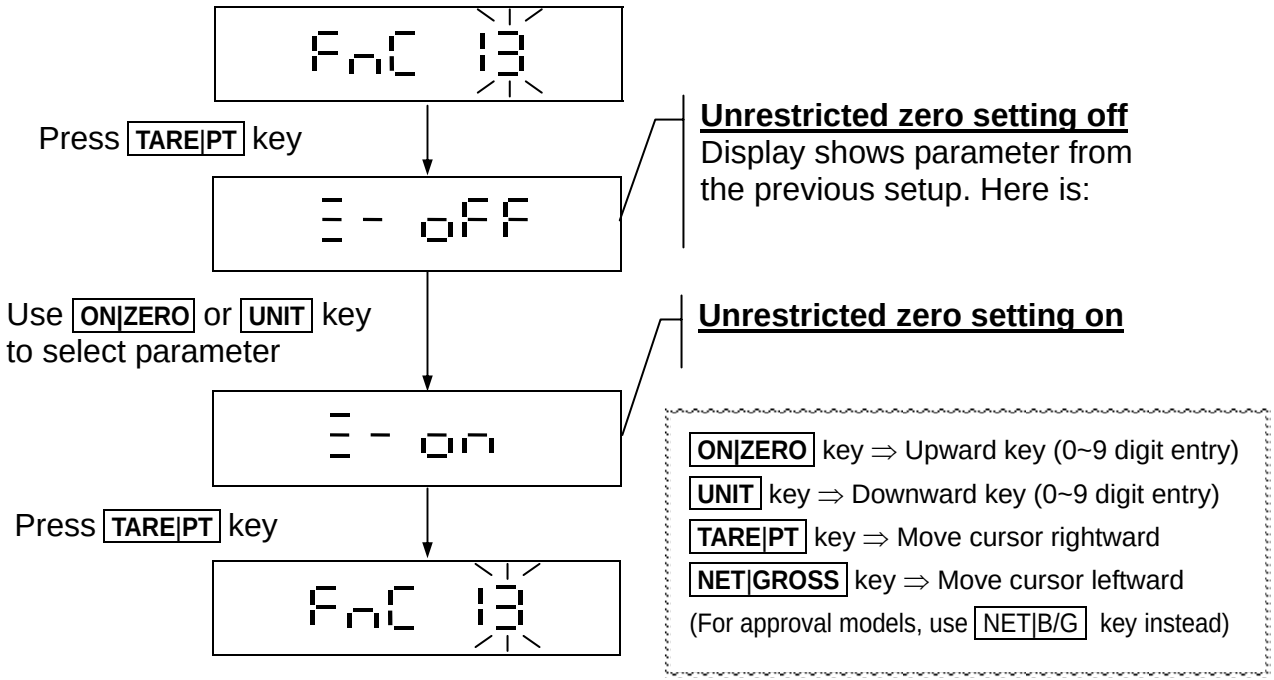


2-1-10 F Key Function Settings FnC 12

(For approval models, use F/HR key instead)

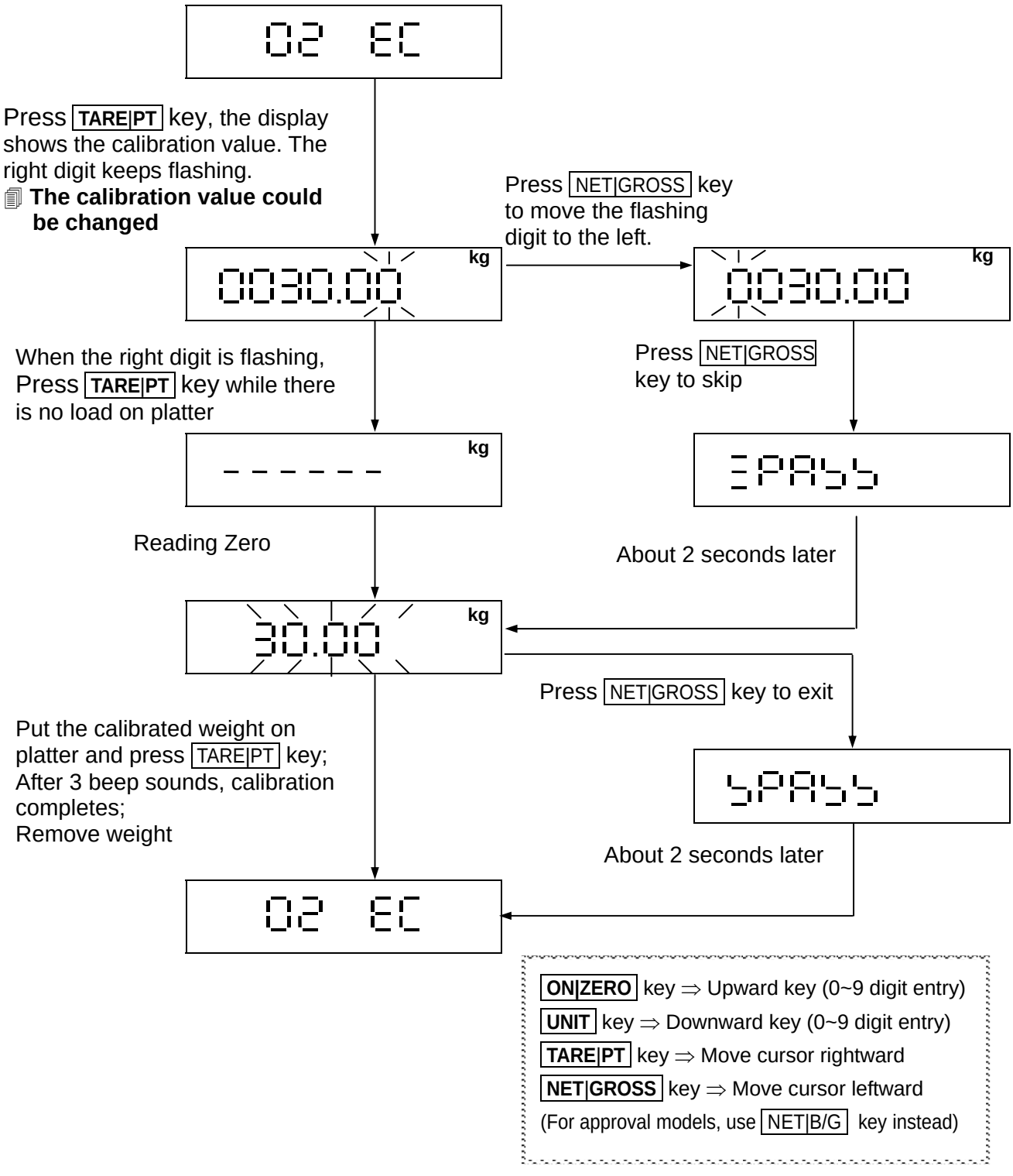


2-1-11 Zero Setting FnC 13



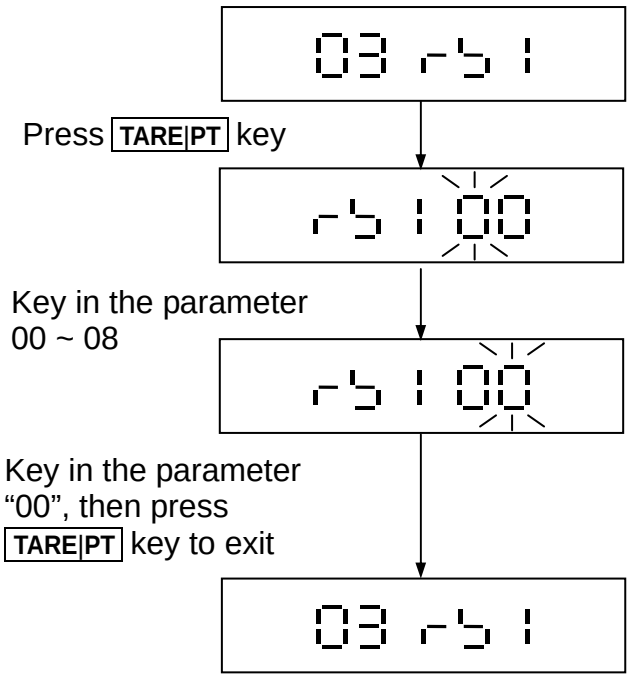
FnC 13 is only for non-approval model with CFn 02 parameter setting.

2-2 External Weight Calibration 02 EC



- The conditions for external weight calibration**:**
  The calibration weight value placed on the platter must be over 100e, and the standard deviation of the weight must be within 10%.
- 02 EC is only for non-approval models

2-3 RS232 Serial Interface Settings 03 rS1

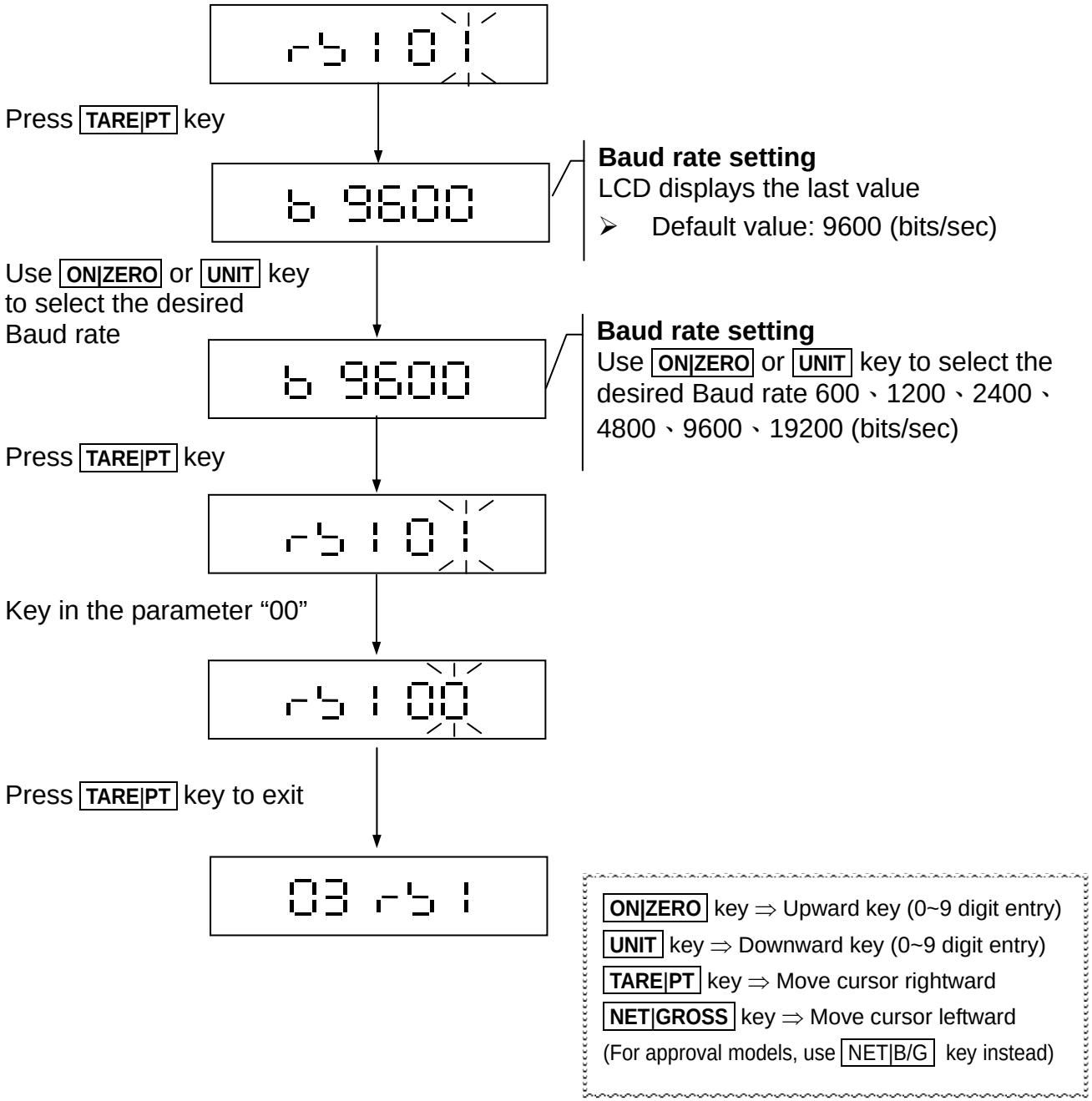


ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

- rS1 00 ⇒ Exit the RS232 Serial Interface Setting Mode
- rS1 01 ⇒ Baud Rate Settings
- rS1 02 ⇒ Communication Protocol Settings
- rS1 03 ⇒ Output Format Settings
- rS1 04 ⇒ Transmission method setup
- rS1 05 ⇒ The Selection of Continuous Transmission Rate
- rS1 06 ⇒ Auto Transmission at Zero
- rS1 07 ⇒ Reset of Auto Transmission
- rS1 08 ⇒ Output Condition Settings
- rS1 09 ⇒ RS232 6/7 digits setting
- rS1 10 ⇒ RTC adjustment
- rS1 11 ⇒ Y/M/D Print Format Selection
- rS1 12 ⇒ RS485 ID Input (Option)
- rS1 13 ⇒ Line Feed Input

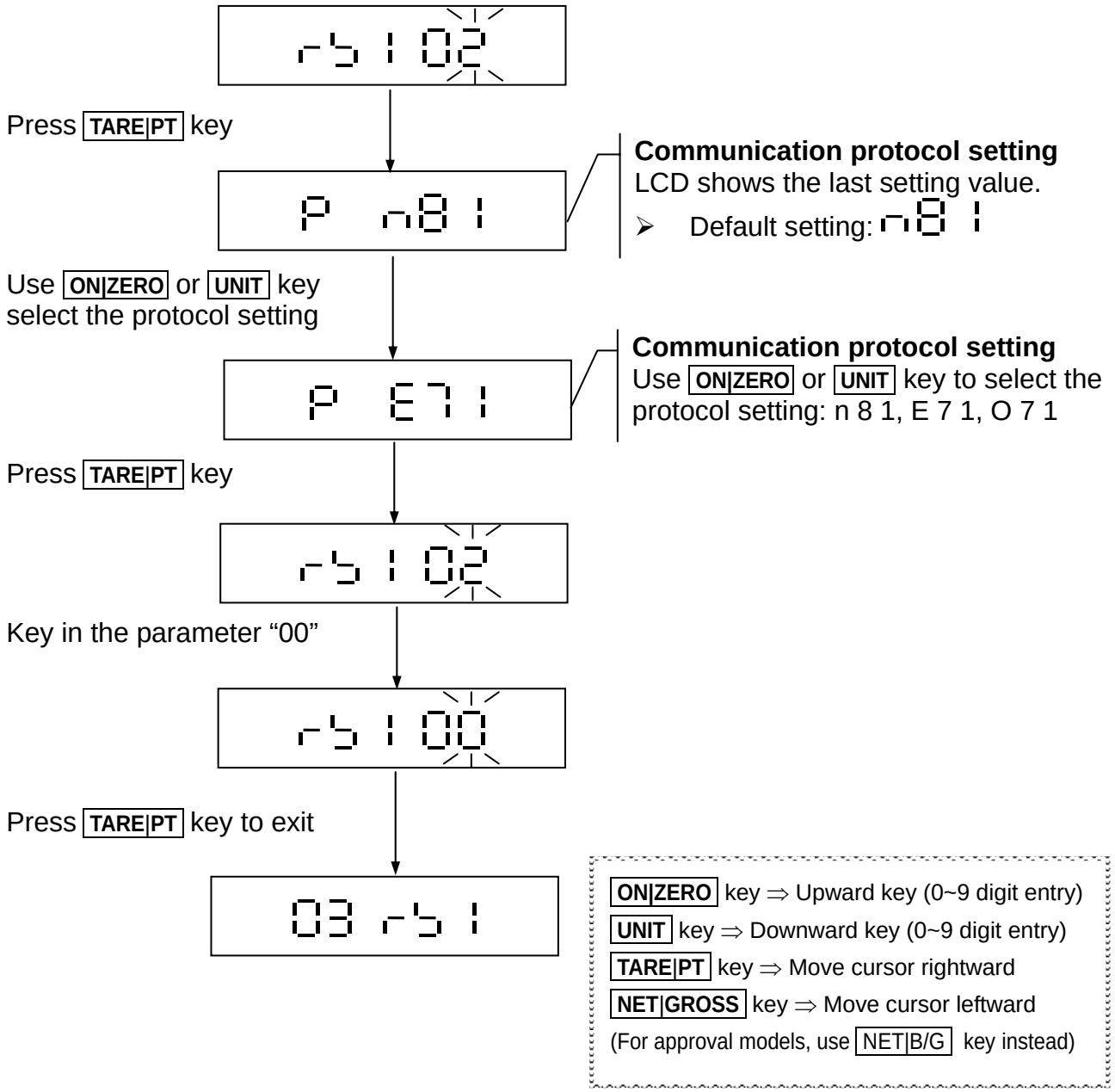
2-3-1 Baud Rate Settings r5 1 01

Select r5 1 01 in the RS232 serial interface setting mode 03 r5 1 to set the Baud Rate.



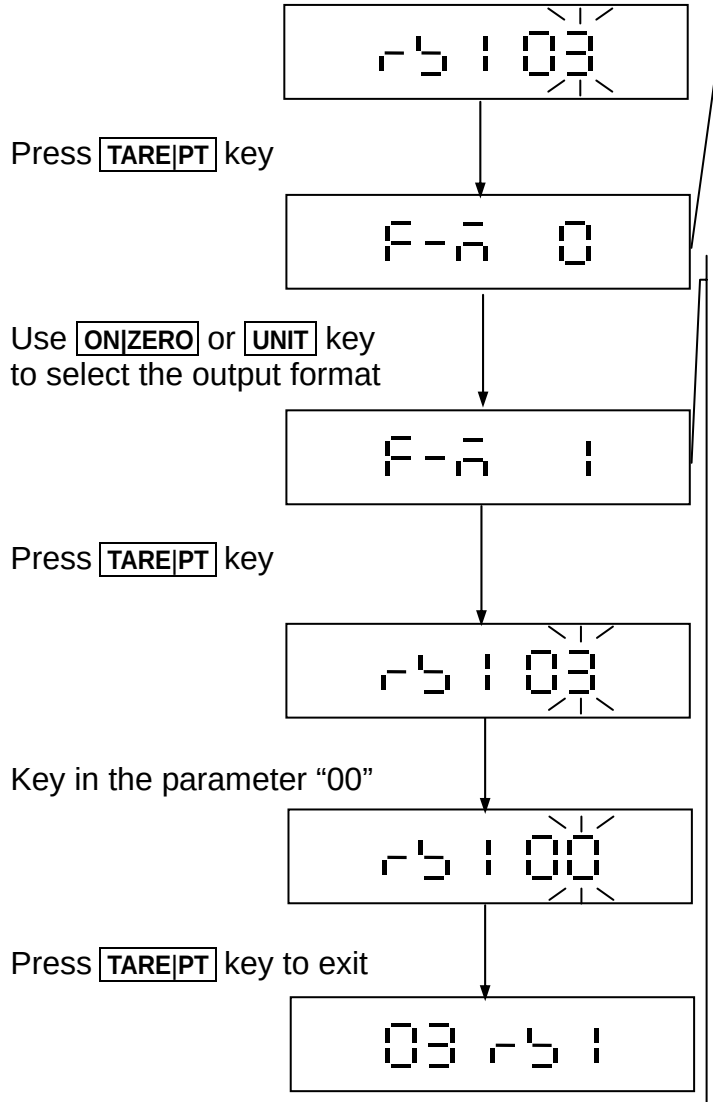
2-3-2 Communication Protocol Settings r5 1 02

Select r5 1 02 in the RS232 serial interface setting mode 03 r5 1 to set the Communication Protocol.



2-3-3 Output Format Settings r5 i 03

Select r5 i 03 in the RS232 serial interface setting mode 03 r5 i to set the Output Format.



RS232 output format setting
LCD shows the last setting.
➢ Default setting: F-n 0

RS232 output format setting
Use ON|ZERO or UNIT key to select the output format:

- F-n 0 = Same data as the scale
- F-n 1 = Gross weight
- F-n 2 = Net weight
- F-n 3 = Same data as the scale in simple format
- F-n 4 = Same gross data as the scale in simple format
- F-n 5 = Same net data as the scale in simple format
- F-n 6 = Hi/Lo/OK status + Same data as the scale in simple format
- F-n 7 = Hi/Lo/OK status + Simple gross weight
- F-n 8 = Hi/Lo/OK status + Simple net weight
- F-n 9 = Tare value
- F-n 10 = M+ Transmission 1 **note 1**
- F-n 11 = M+ Transmission 2 **note 2**
- F-n 12 = Brazil printing format **note 3**

Format 12 are only for Brazil
Format 10.11 are not available on counting mode

ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

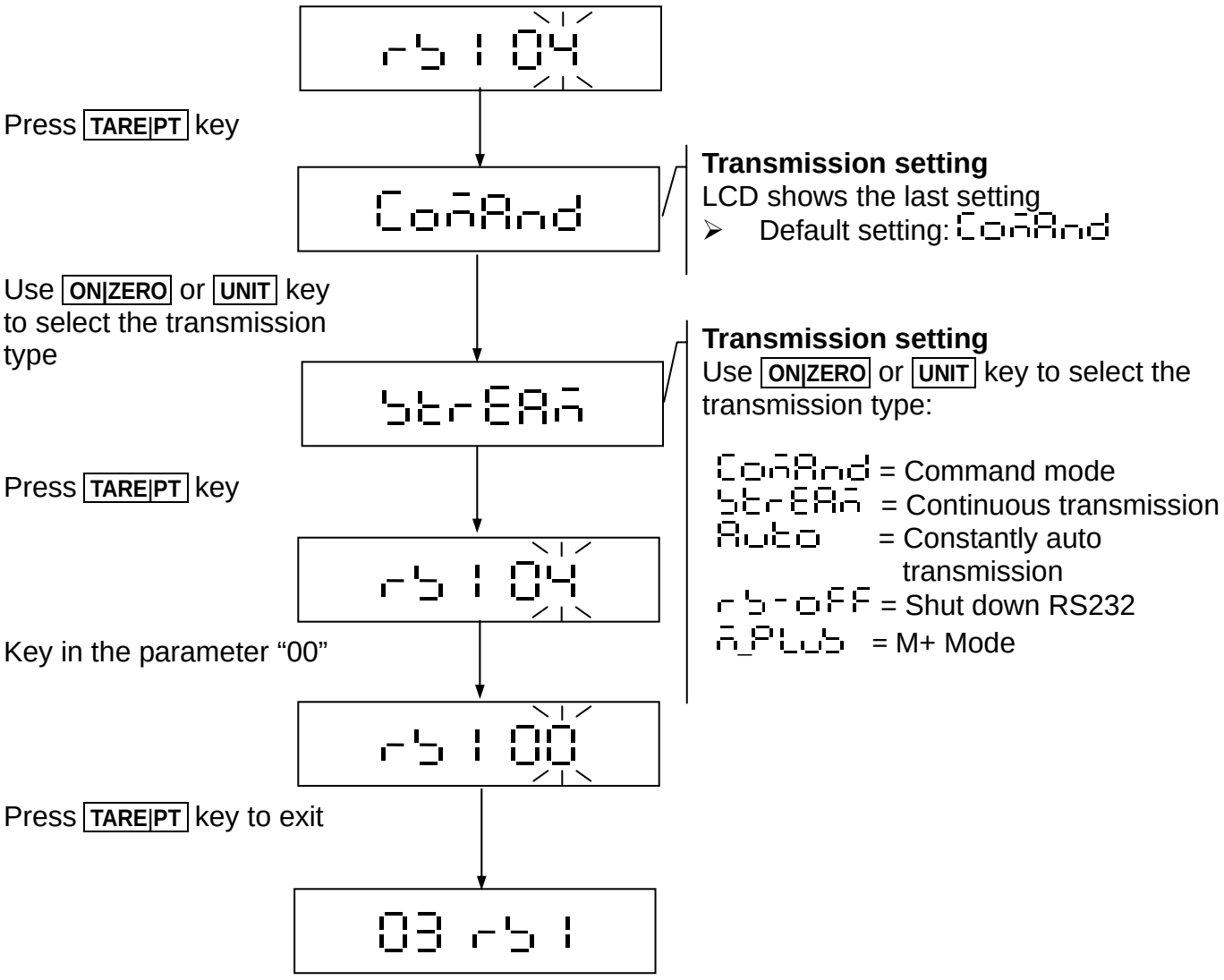
Note1:
Ticket No.
Date year/month/day & day/month/year (choose 1 out of 2 date formats)
Time
G
T
N
Total Net (This line will only print when data is erased, showing net weight total of every count)

Note2:
Ticket No.
Date year/month/day & day/month/year (choose 1 out of 2 date formats)
Time
G
T
N
Total Weight (This line will only print when data is erased, showing gross weight total of every count)

Note3:
If it is not Brazil version, it can only print under continuous transmition.
If it is Brazil version, under decimal units mode, FnC 11=Pr int and
r5104=A_PLUS, it can print out. It is not available on counting mode.
For example:
70.15Kg print as: =51.07000=51.07000=51.07000=51.07000=51.07000
negative 70.15Kg print as: =51.0700-=51.0700-=51.0700-=51.0700-=51.0700-

2-3-4 Continuous Transmission Settings r5 1 04

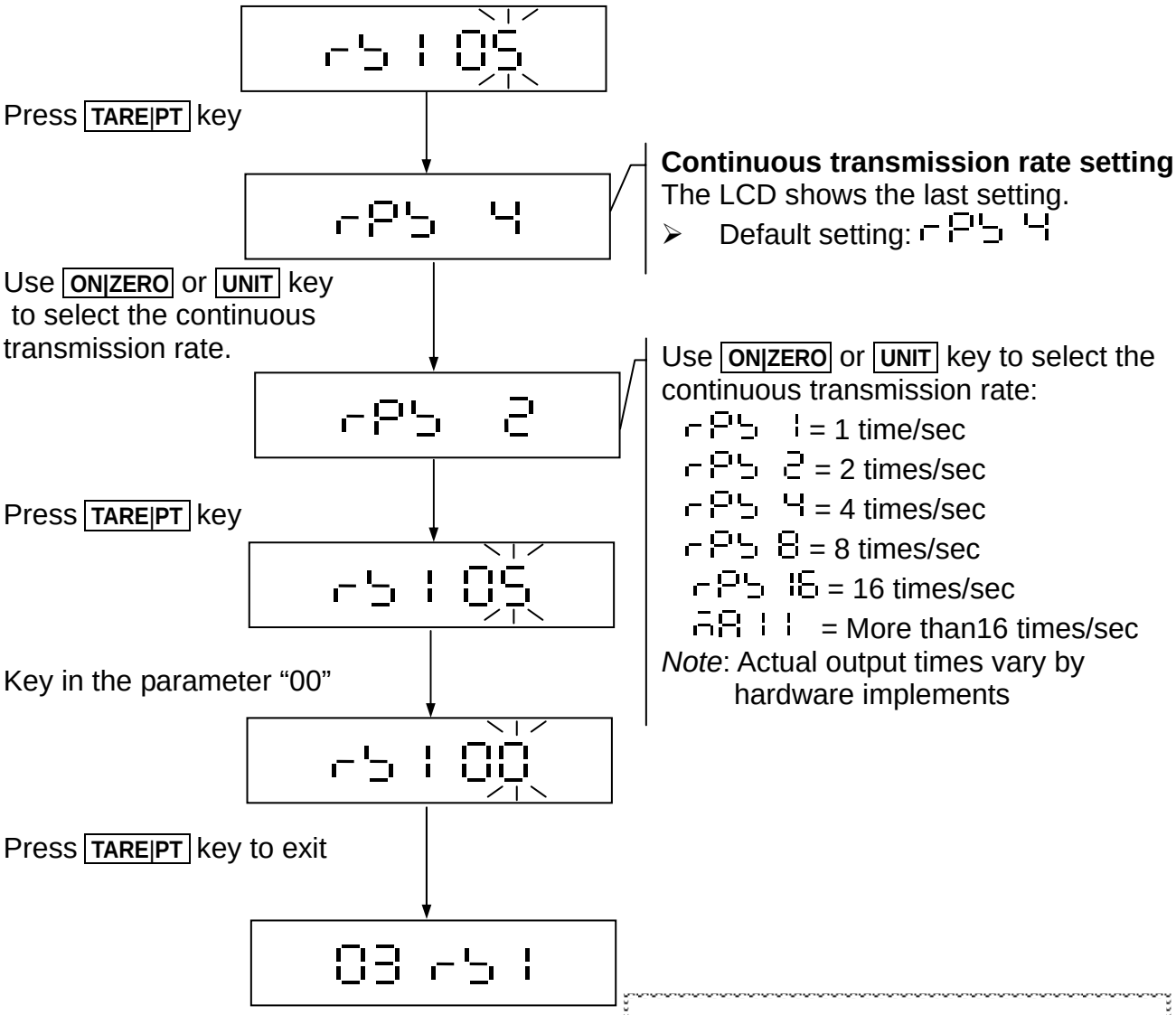
Select r5 1 04 in the RS232 serial interface setting mode 03 r5 1 to set the Continuous Transmission status.



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

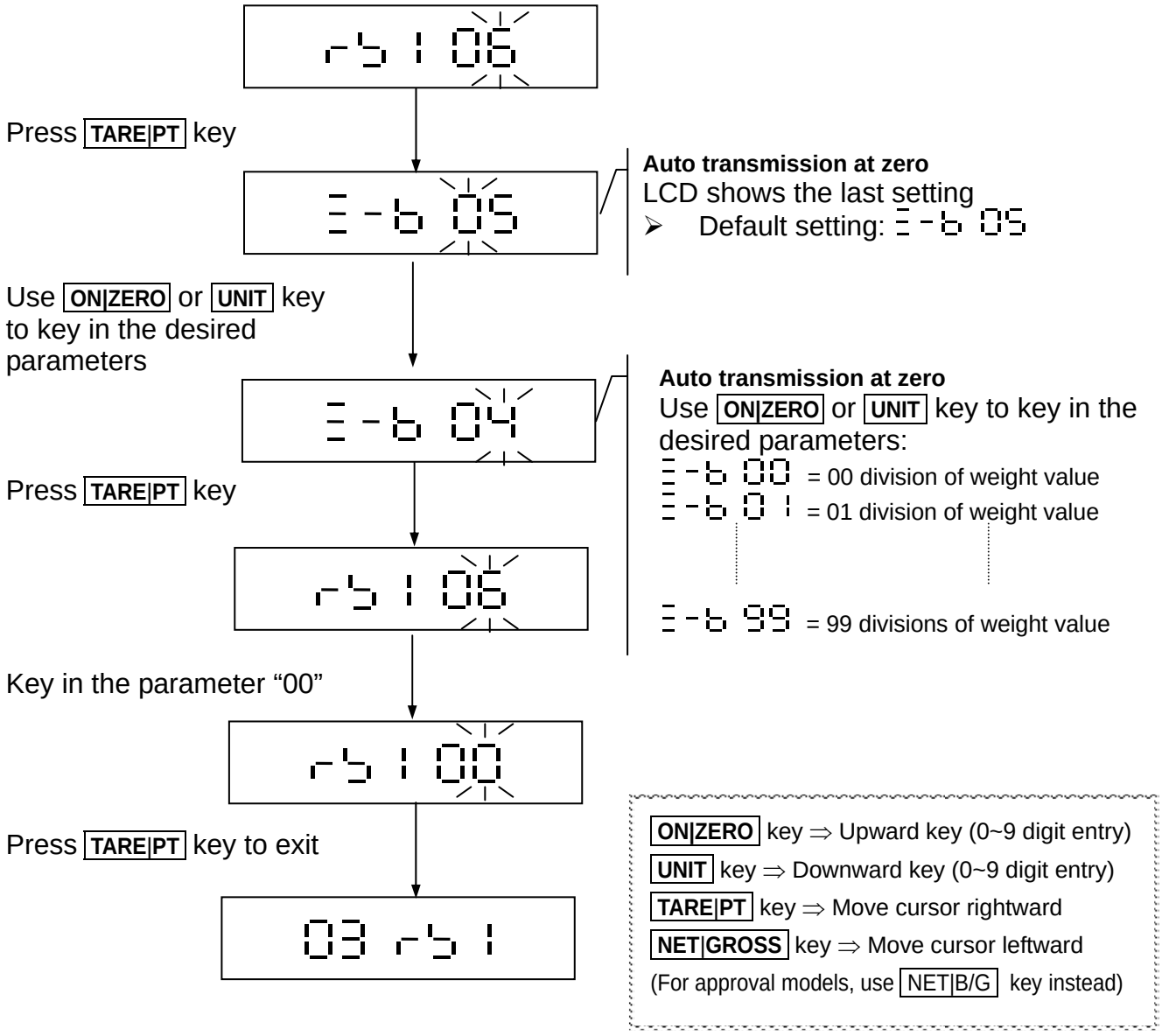
2-3-5 Selection of the Continuous Transmission Rate r5 105

Select r5 105 in the RS232 serial interface setting mode 03 r5 1 to set the Continuous Transmission Rate.



2-3-6 Auto Transmission at Zero r5 1 06

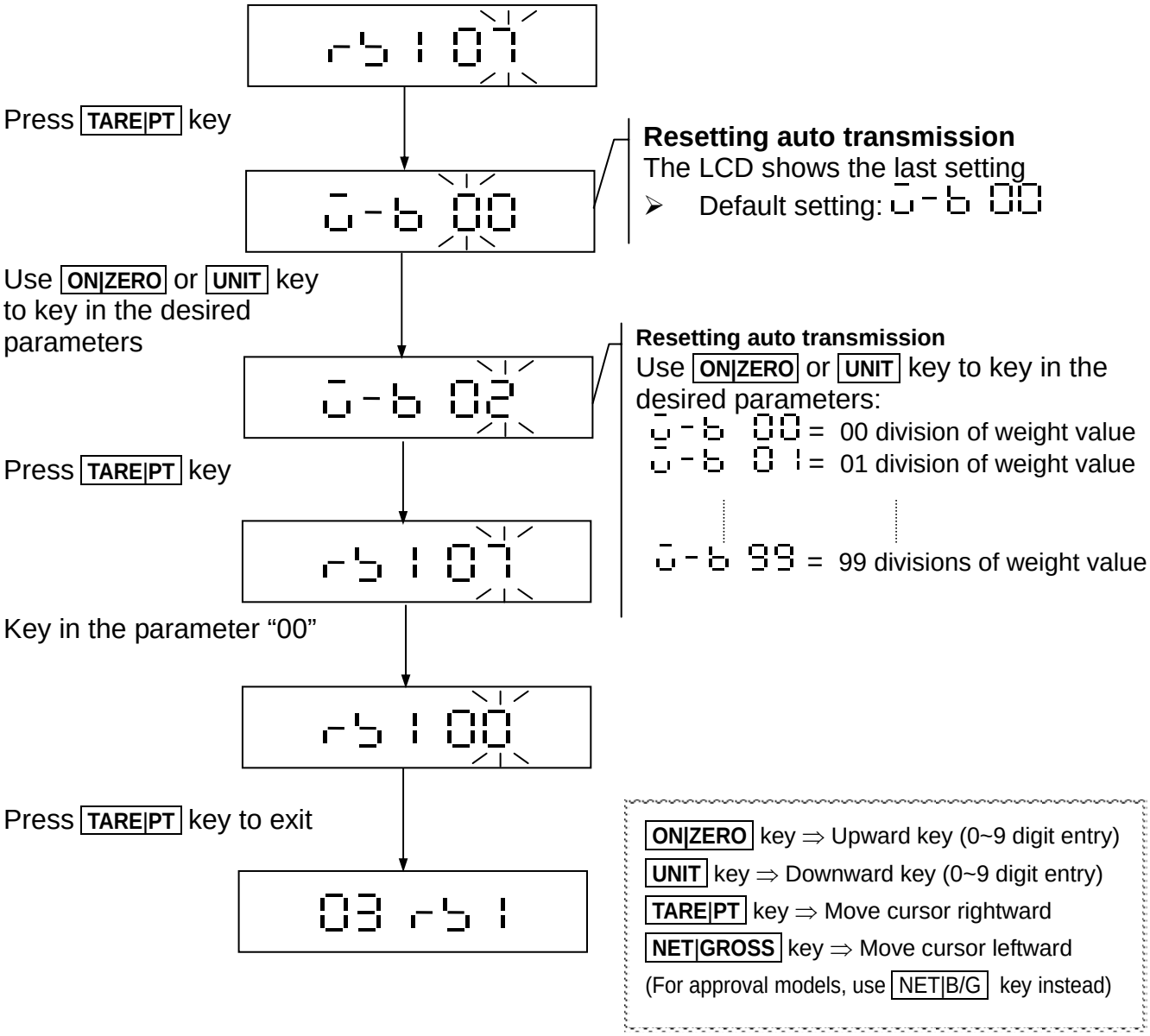
Select r5 1 06 in the RS232 serial interface setting mode 03 r5 1 to set the Auto Transmission at Zero.



- When the value of "Auto transmission at zero" set as Z-b 00, the "Auto transmission at zero" function is not available. Because when the scale is at zero and keeping stable, the data are keeping transmitted, and that would be the same as "Continuous Transmission".

2-3-7 Reset Auto Transmission r5 1 07

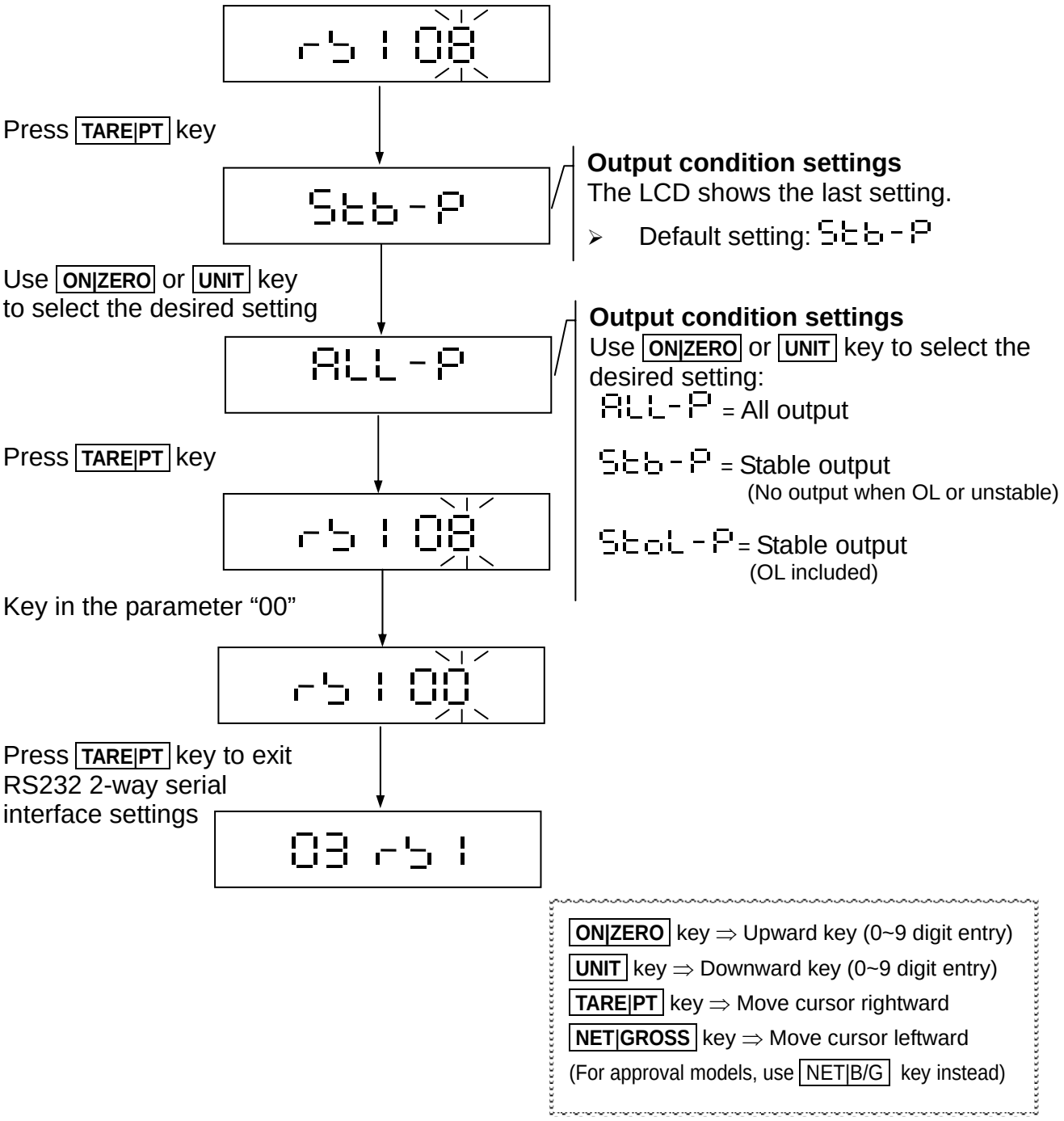
Select r5 1 07 in the RS232 serial interface setting mode 03 r5 1 to Reset Auto Transmission.



When the value of "Auto transmission at zero" set as U-b 00, the "Auto transmission at zero" function is not available. Because when the scale is at zero and keeping stable, the data are keeping transmitted, and that would be the same as "Continuous Transmission".

2-3-8 Output Condition Settings rS1 08

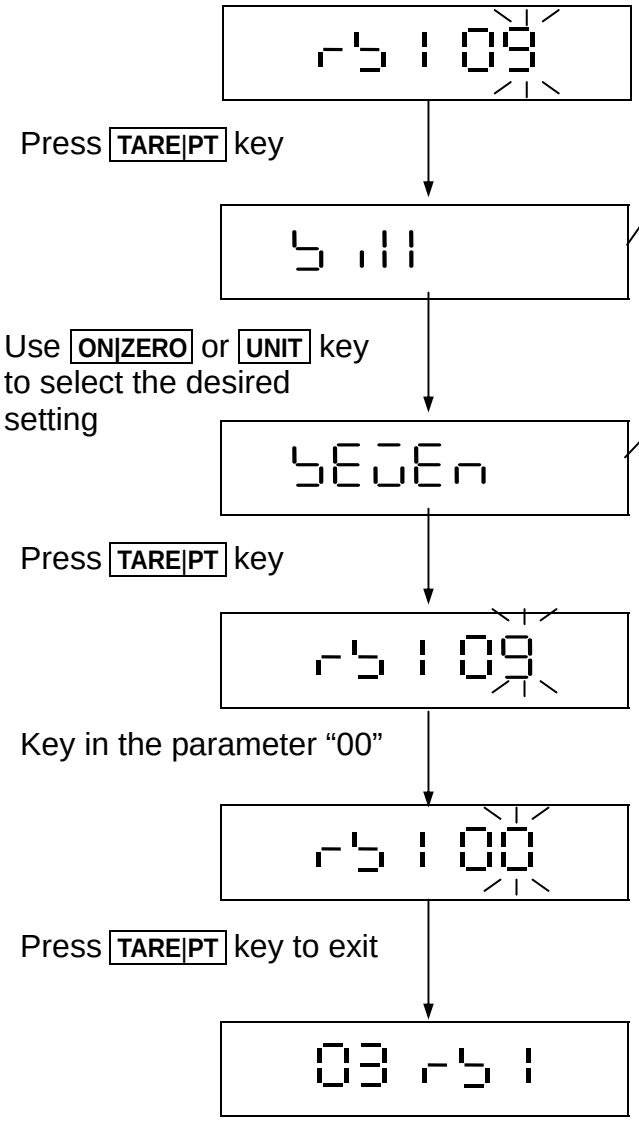
Select rS1 08 in the RS232 serial interface setting mode 03 rS1 to Reset of Auto Transmission.



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

2-3-9 RS232 6/7 Digits Setting r5 1 09

Select r5 1 09 in the RS232 serial interface setting mode 03 r5 1 to Reset of Auto Transmission.



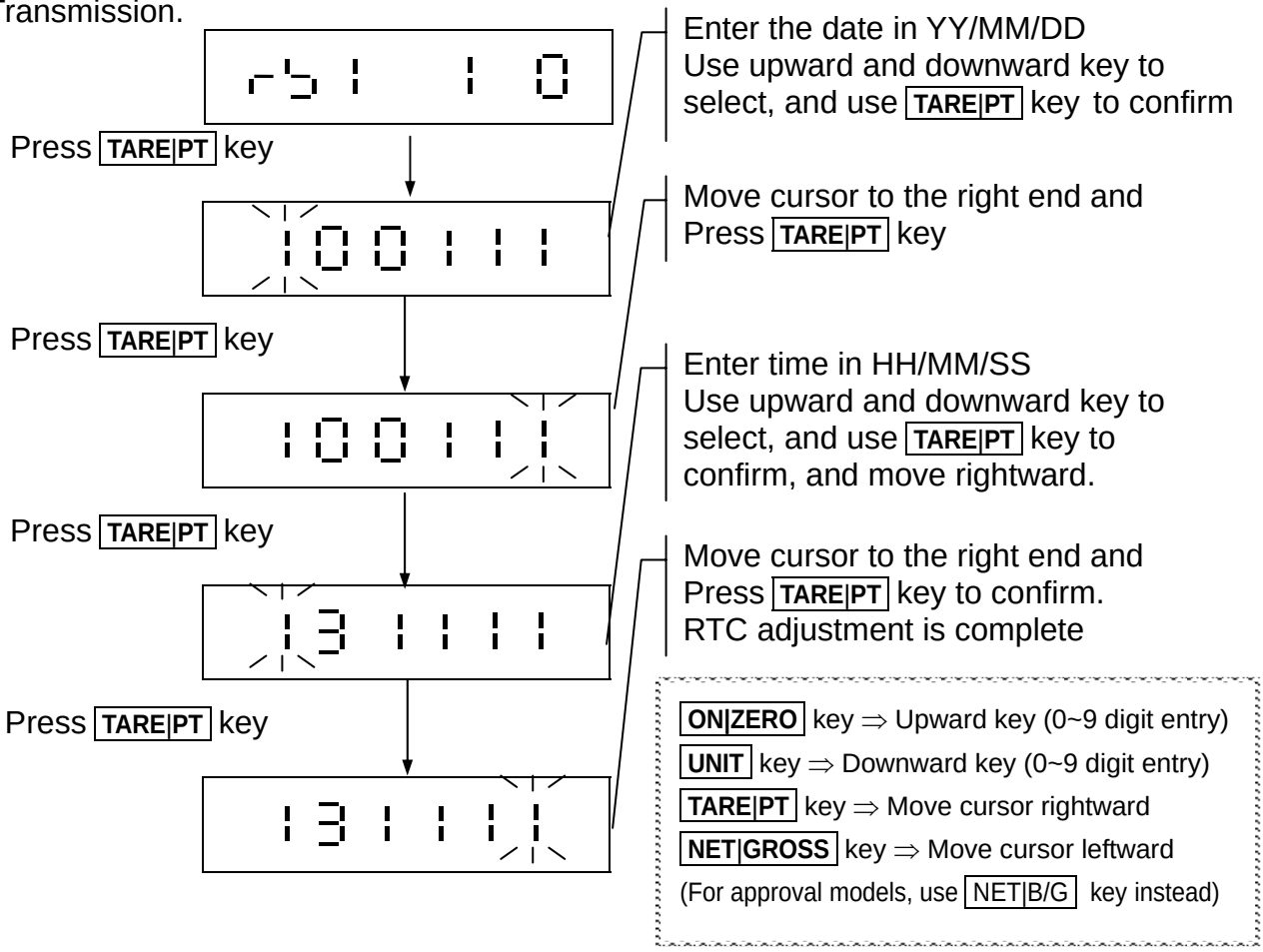
Output Condition Restriction Settings
Display shows the previous setup
Factory Default is 5 .11 (6 places)

Output Condition Restriction Settings
Use ON|ZERO or UNIT key to select desired setting.
Output condition:
5 .11 = 6 digits
5E0En = 7 digits

ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

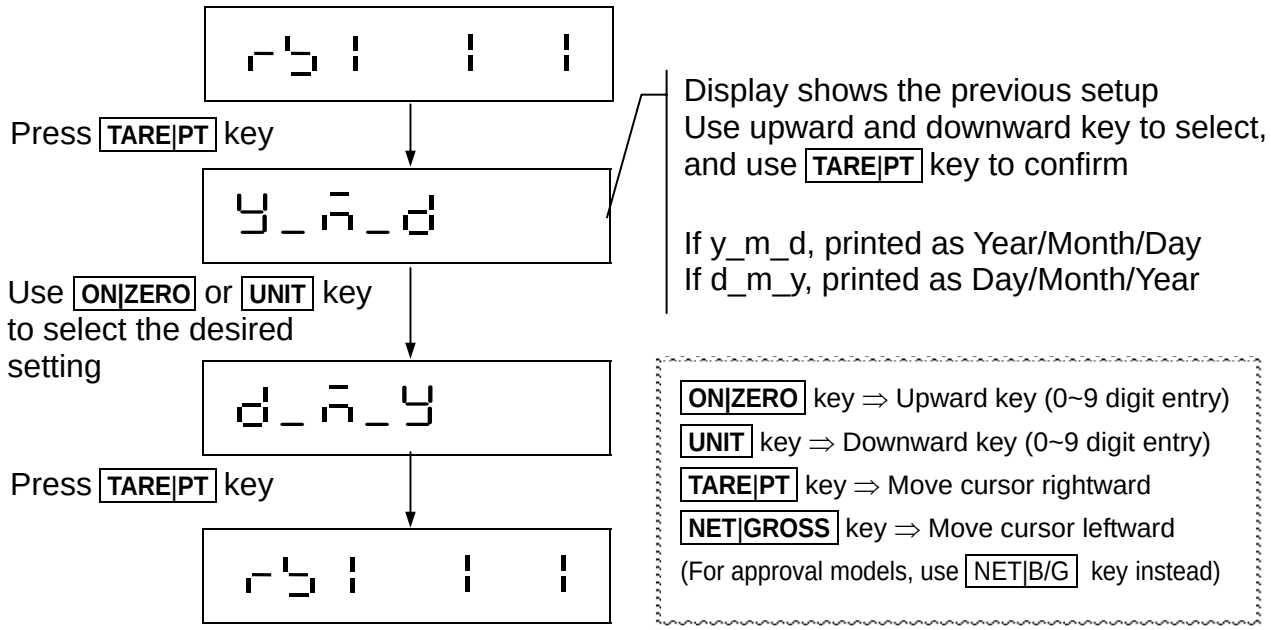
2-3-10 RTC Adjustment r5 1 1 0

Select r5 1 10 in the RS232 serial interface setting mode 03 r5 1 to reset of Auto Transmission.



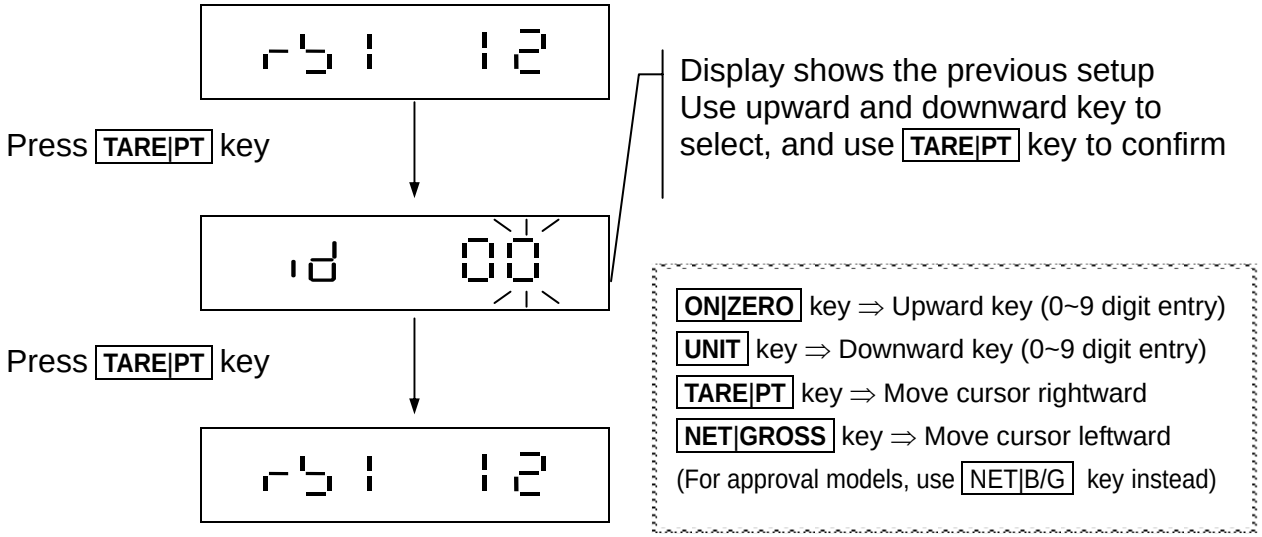
2-3-11 Y/M/D Print Layout Selection r5 1 11

Select r5 1 11 in the RS232 serial interface setting mode 03 r5 1 to reset of Auto Transmission.



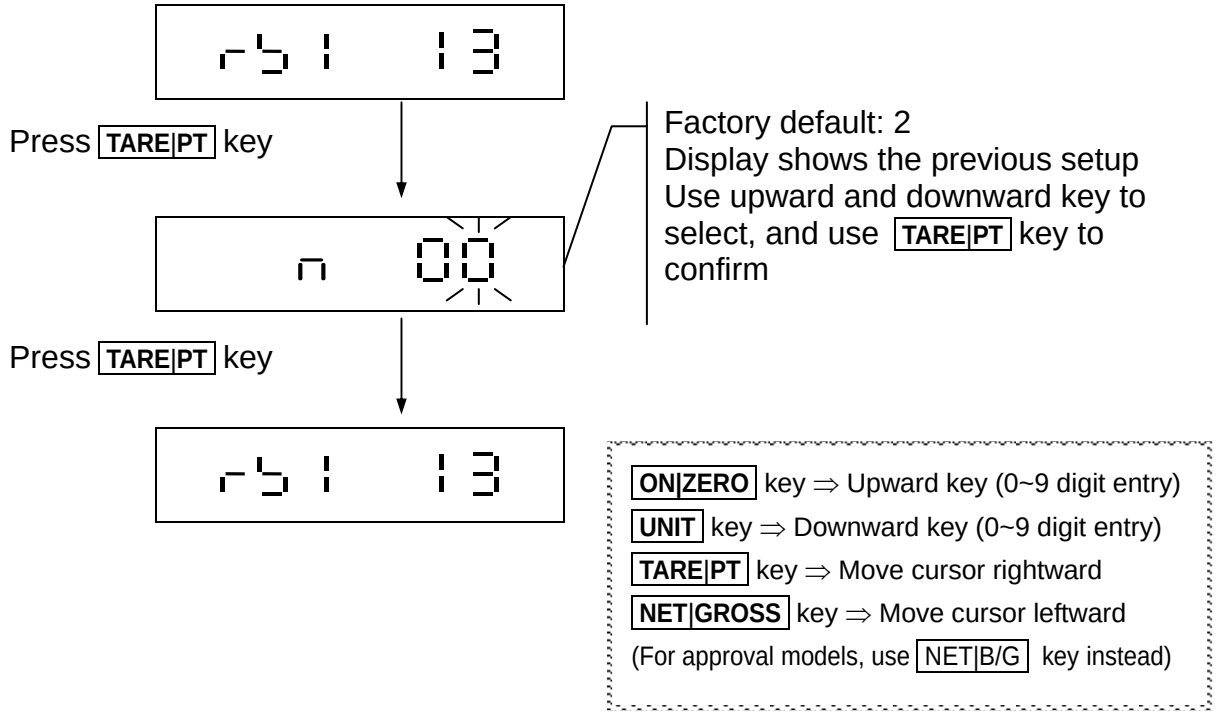
2-3-12 RS485 ID Input (Option) r5 1 12

Select r5 1 12 in the RS232 serial interface setting mode 03 r5 1 to reset of Auto Transmission.



2-3-13 Line Feed Input r5 1 13

Line feed would be available only when r5 1 03 was set as 10 or 11.



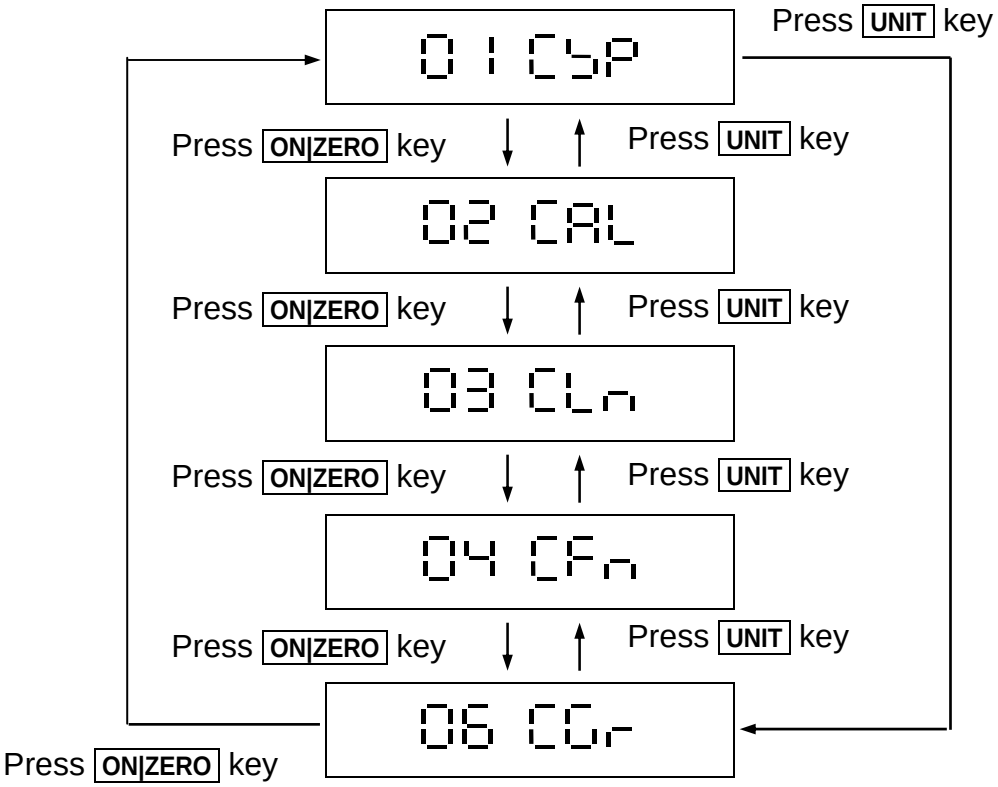
Chapter 3 Service Mode Access

Open the case, then switch the mini-jumper SWA1 on the main board to the ADJ position (EEPROM UNLOCKED). Turn the power on. The display shows 01 CAP.

When finished, set the jumper SWA1 back to the LOCK position.

If the jumper SWA1 is returned to the LOCK position during calibration, the machine exits the service mode automatically.

The Service Mode Access contains 6 settings as below:



01 CAP ⇒ Capacity Setup

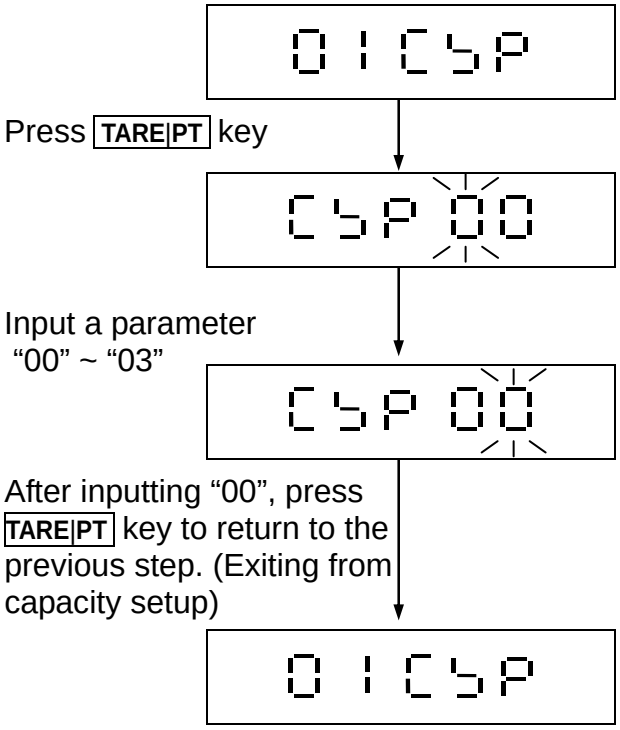
02 CAL ⇒ Weighing Calibration

03 CLn ⇒ Linearity Calibration

04 CFn ⇒ Function Setting

06 CGr ⇒ Local Gravity Setting

3-1 Capacity Setup 01 CAP

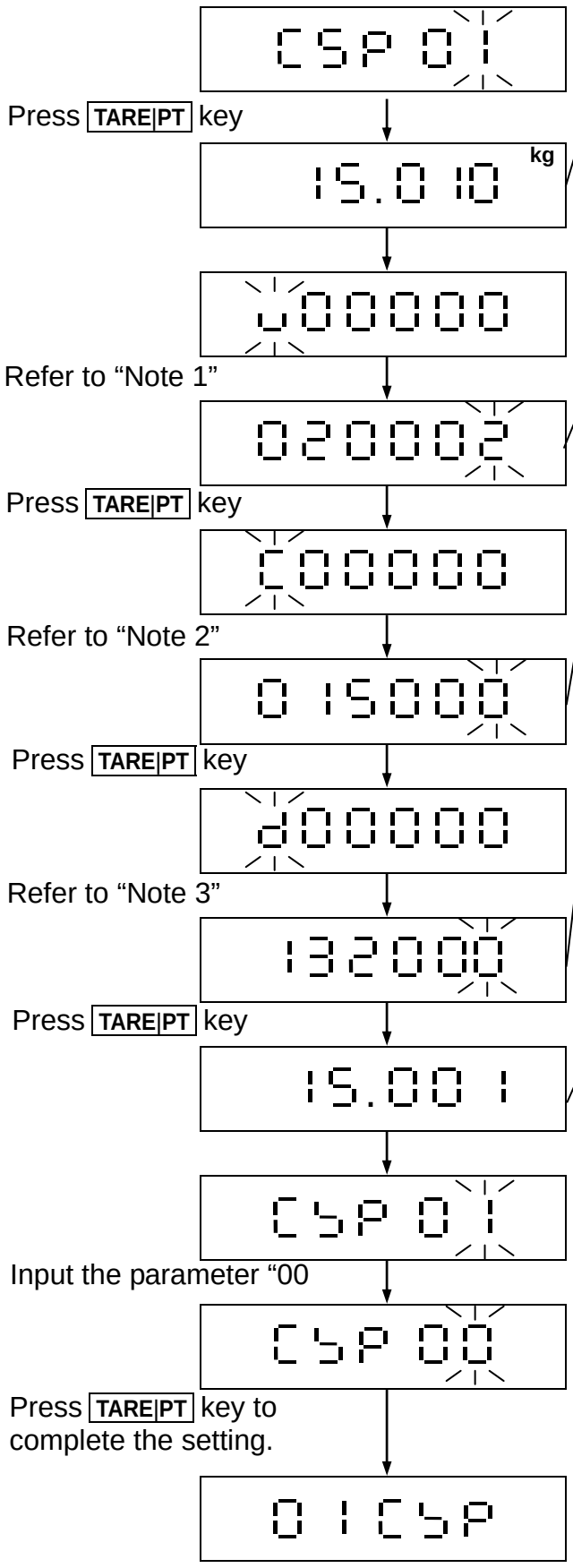


ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

CAP 00 ⇒ Return to the Upper Level
CAP 01 ⇒ Weight Units Setting
CAP 02 ⇒ Customised Weight Units Setting
CAP 03 ⇒ Multi-segment Setting

3-1-1 Weight Unit Setting CSP01

There is no resolution limitation when the weight units “kg, g, lb, lb/oz” are selected. The weight units ”oz, GN, dwt, and ct” are only available on indicators with less 1/10,000 external resolution.



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

NOTE 1 The users can set up the different weight units in various orders according to their preference, and the amount of the chosen weight units can be up to 5


(a) (b) (c) (d) (e) (f)

(a) ⇒ The first weight unit (only "kg", "g", or "lb" are available to choose from. Please select one of the parameters 0, 1, or 2)
(b) ⇒ The second weight unit (select one of the parameters described below)
(c) ⇒ The third weight unit (select one of the parameters described below)
(d) ⇒ The fourth weight unit (select one of the parameters described below)
(e) ⇒ The fifth weight unit (select one of the parameters described below)
(f) ⇒ The amount of the weight units selected (select one of parameters 1 ~ 5)

The description of the parameters

0 ⇒ kg (Decimal system)	5 ⇒ oz (Decimal system)
1 ⇒ g (Decimal system)	6 ⇒ GN (Decimal system)
2 ⇒ lb (Decimal system)	7 ⇒ dwt (Decimal system)
4 ⇒ lb, oz (hexadecimal)	8 ⇒ ct (Decimal system)

For example:
Choose "kg" & "lb" (two weight units). NOTE the scale is calibrated using "kg" weights and key in 020002

NOTE 2 Enter the maximum capacity of the scale, total 6 digits (not including 9d)


(g) (h) (i) (j) (k) (l)

For example:
15.000 kg ⇒ key in 015000
1500.0 g ⇒ key in 015000
6.000 lb ⇒ key in 006000

NOTE 3 Set the minimum division and decimal point position to determine the display resolution


(m) (n) (o) (p) (q)

Division = m * 10^{-n*q}, m = base value, n = numbers of decimal point,
q = multiplication factor

(m) ⇒ Division base value, select 1, 2, or 5

(n) ⇒ The number of decimal places (0 ~ 5)
For example: 15.000 kg ⇒ enter 3, 1500.0 g ⇒ enter 1, 6.000 lb ⇒ enter 3

(o) ⇒ range setting (select one of parameters 0, 1, 2, or 3)
For example:
0, 1 ⇒ full segment range, 2 ⇒ 2 segment range (divided at 1/2 of the full scale),
3 ⇒ 3 segment range (divided at 1/6 of the full scale & 2/3 of the full scale)

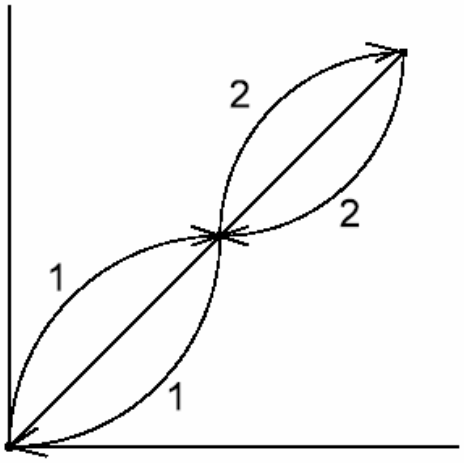
(p) ⇒ 0 : multi-interval 1 : multi-range

Multi interval: Multiple segment range and each segment with its own minimum and maximum capacity and scale interval. The selection of the appropriate weighing segment is determined automatically according to the load applied, both on increasing and decreasing loads.

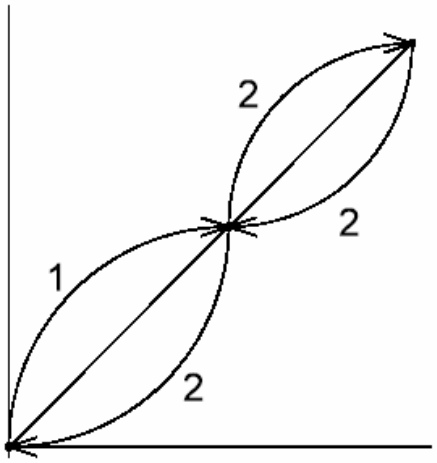
Multi range: Similar to Multi-interval, but the scale interval unchanged when unloading until weight return to zero

2 Segment range:

Multi interval

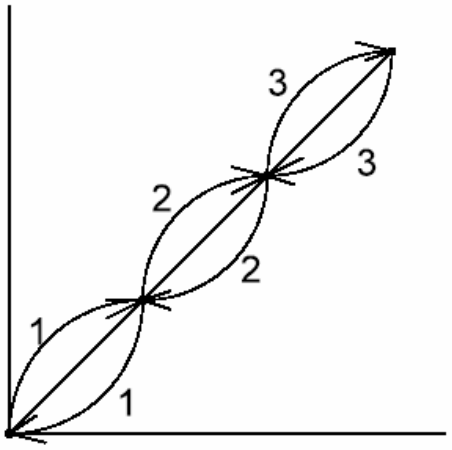


Multi range

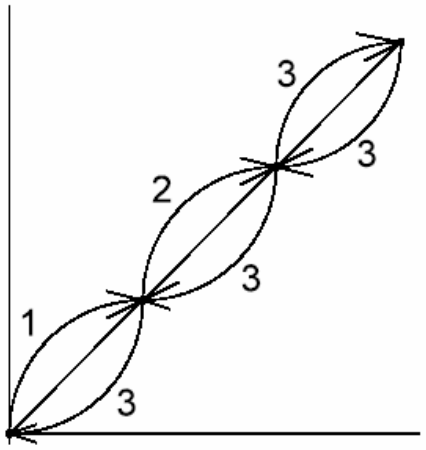


3 Segment range:

Multi interval



Multi range



(q) ⇒ Division multiplication factor: (Only one Weight UNITS Model is available)

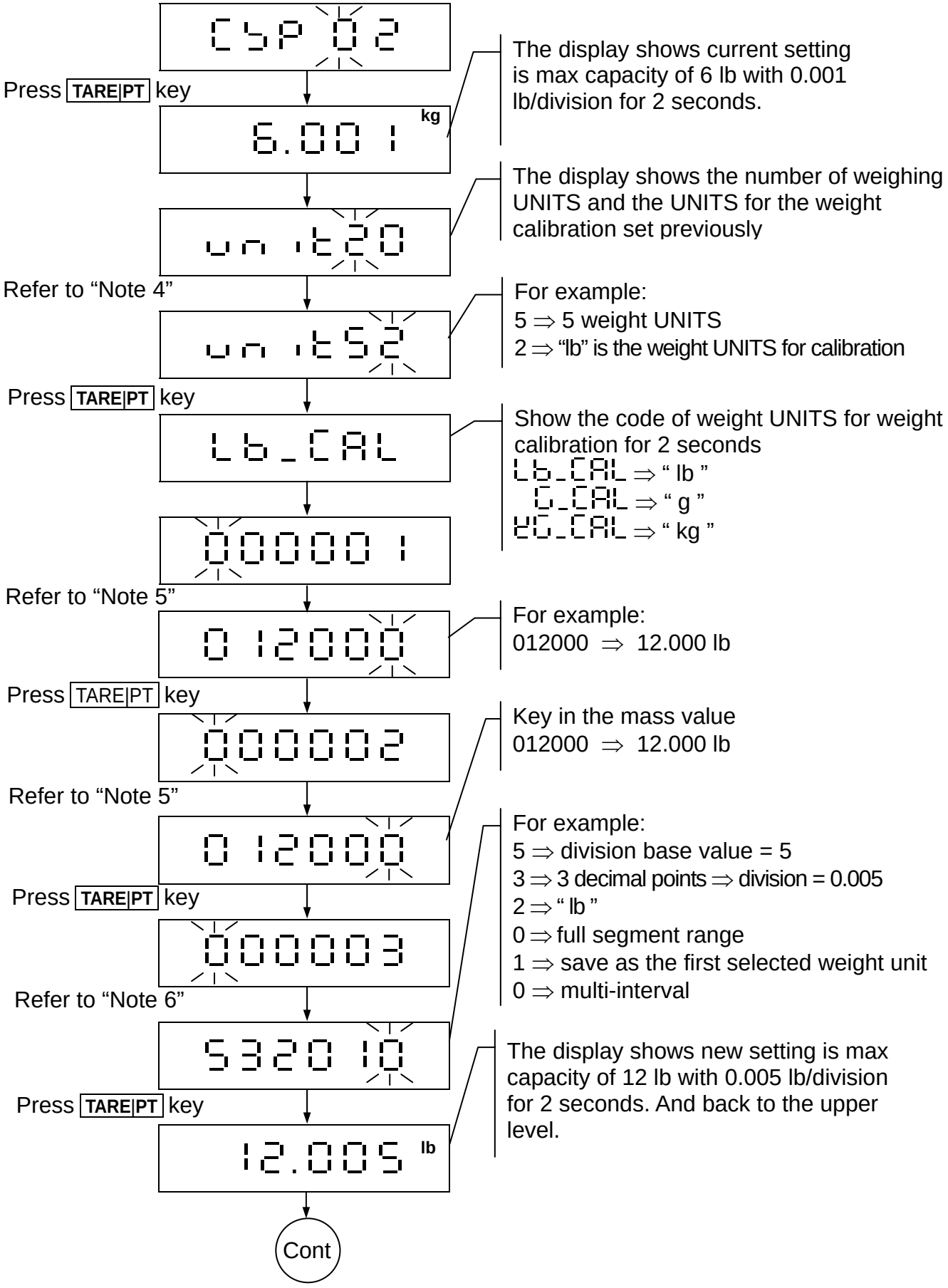
0 ⇒ no factor 1 ⇒ base value X 10

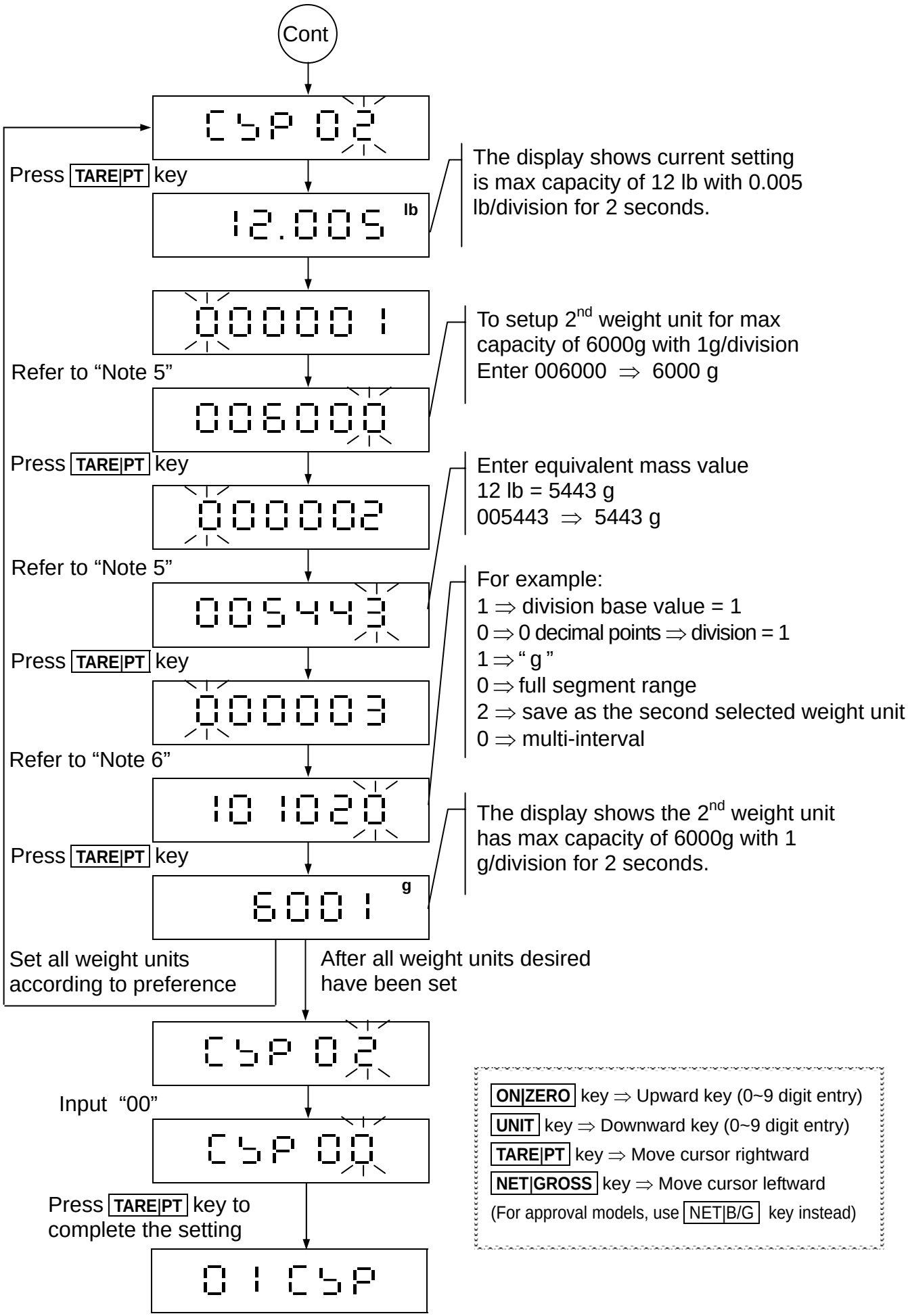
Division Table for various m and q values:

(m) = 1	(m) = 2	(m) = 5	(m) = 1	(m) = 2	(m) = 5
(q) = 0			(q) = 1		
1	2	5	10	20	50

P.S. If 2 segment range and multi-interval is set, tare automatically cancels out after weight is cleared.

3-1-2 Customised Capacity Setting C5P 02




Cont
CAP 02
Press TARE|PT key
12.005 lb
The display shows current setting is max capacity of 12 lb with 0.005 lb/division for 2 seconds.
000001
Refer to "Note 5"
To setup 2nd weight unit for max capacity of 6000g with 1g/division
Enter 006000 ⇒ 6000 g
006000
Press TARE|PT key
Enter equivalent mass value
12 lb = 5443 g
005443 ⇒ 5443 g
000002
Refer to "Note 5"
For example:
1 ⇒ division base value = 1
0 ⇒ 0 decimal points ⇒ division = 1
1 ⇒ " g "
0 ⇒ full segment range
2 ⇒ save as the second selected weight unit
0 ⇒ multi-interval
005443
Press TARE|PT key
000003
Refer to "Note 6"
10 1020
Press TARE|PT key
The display shows the 2nd weight unit has max capacity of 6000g with 1 g/division for 2 seconds.
6001 g
Set all weight units according to preference
After all weight units desired have been set
CAP 02
Input "00"
CAP 00
Press TARE|PT key to complete the setting
01 CAP
ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

NOTE 4

(a) (b)

(a) ⇒ The number of the weight units (Max: 5, key in 1 ~ 5)
(b) ⇒ The weight unit for weight calibration (choose from “kg”, “g”, “lb”, key in 0, 1, or 2)

Parameter description:
0 ⇒ kg , 1 ⇒ g , 2 ⇒ lb

NOTE 5

(c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n)

c ~ h set the maximum capacity (6 digits)

i ~ n set the mass value for weight calibration (6 digits)

The maximum capacity needs to be presented based on the decimal system, and the first unit must be the calibration unit.

For example: *How to calculate the maximum capacity and the mass value based on the different types of weight unit.*

A. Choose “kg” as the weight unit for the weight calibration

① The first weight unit setting: 6.000 kg / 0.002 kg
⇒ Enter the maximum capacity 006000 at (c) ~ (h)
⇒ Enter the mass value 006000 at (i) ~ (n)

② Unit “lb” (hexadecimal notation system)
Calibration weight is 6kg. 0.001 kg = 0.002204623 lb
6 kg = 6×2.204623 (lb) = 13.227738 lb. Take 12 lb as the max capacity
12._0.00 lb / 0.08 oz (minimum division=8, decimal point position=2)
12 lb ×16 (oz) = 192.00 oz ⇒ Enter the maximum capacity 019200 at (c) ~ (h)
13.227738 lb ×16 (oz) = 211.64 oz ⇒ Enter the mass value 021164 at (i) ~ (n)

③ Unit “GN”
Calibration weight is 6kg. 0.001 kg = 15.432358GN
6kg=92594GN ⇒ Enter the calibration weight 092594 at (i) ~ (n)
The maximum capacity 100000GN ⇒ Enter the maximum capacity 100000 at (c) ~ (h)

B. Choose “lb” (decimal notation system) as the weight unit for the weight calibration

① The first weight unit setting: 12.000 lb / 0.005 lb (the maximum Capacity / division)
⇒ Enter the maximum capacity 012000 at (c) ~ (h)
⇒ Enter the mass value 012000 at (i) ~ (n)

② The second weight unit setting “g”
0.002204623 lb = 1 g
12 lb = 5443 g. Take 6000 g as the maximum capacity
6000 g / 2 g (the maximum Capacity / division),
⇒ Enter the maximum capacity 006000 at (c) ~ (h)
⇒ Enter the mass value 005443 at (i) ~ (n)

③"lb/oz" (hexadecimal notation system):
12._0.00 lb / 0.05 oz (the maximum Capacity / division)
12 lb = 12×16 (oz) = 192.00 oz
⇒ Enter the maximum capacity 019200 at (c) ~ (h)
⇒ Enter the mass value 019200 at (i) ~ (n)

④"oz" :
Calibration weigh 12 lb = 192.00 oz ,
Take 200.00 oz as the maximum capacity
200.00 oz / 0.05 oz (the maximum Capacity / division)
⇒ Enter the maximum capacity 020000 at (c) ~ (h)
⇒ Enter the mass value 019200 at (i) ~ (n)

⑤"GN" :
Calibration weight 12 lb, 0.002204623 lb = 15.432358 GN
12 lb = 84000 GN, (1 GN = 0.06479891 g)
84000 GN / 10 GN,
⇒ Enter the maximum capacity 084000 at (c) ~ (h)
⇒ Enter the mass value 084000 at (i) ~ (n)

NOTE 6


(o) (p) (q) (r) (s) (t)

(o) ⇒ Minimum division setting
Parameter description:

Decimal system:
Input 1, 2, or 5 as the minimum division for the weight value

Hexadecimal notation system:
Input 1, 2, 4, or 8 as the minimum division for the weight value

(p) ⇒ Decimal point position
Parameter description:

Decimal system:
0 ⇒ 0
1 ⇒ 0.0
2 ⇒ 0.00
3 ⇒ 0.000
4 ⇒ 0.0000
5 ⇒ 0.00000

Hexadecimal notation system:
0 ⇒ 0._0
1 ⇒ 0._0.0
2 ⇒ 0._0.00
3 ⇒ 0._0.000

(q) ⇒ Weight unit displayed

Parameter	0	1	2	4	5	6	7	8
Unit	kg	g	lb	lb,oz	oz	GN	dwt	ct
Notation system	10	10	10	16	10	10	10	10
symbol	kg	g	lb	lb	Icon 7 ▼ indication	Icon 6 ▼ Indication	Icon 6 ▼ indication	Icon 6 ▼ indication

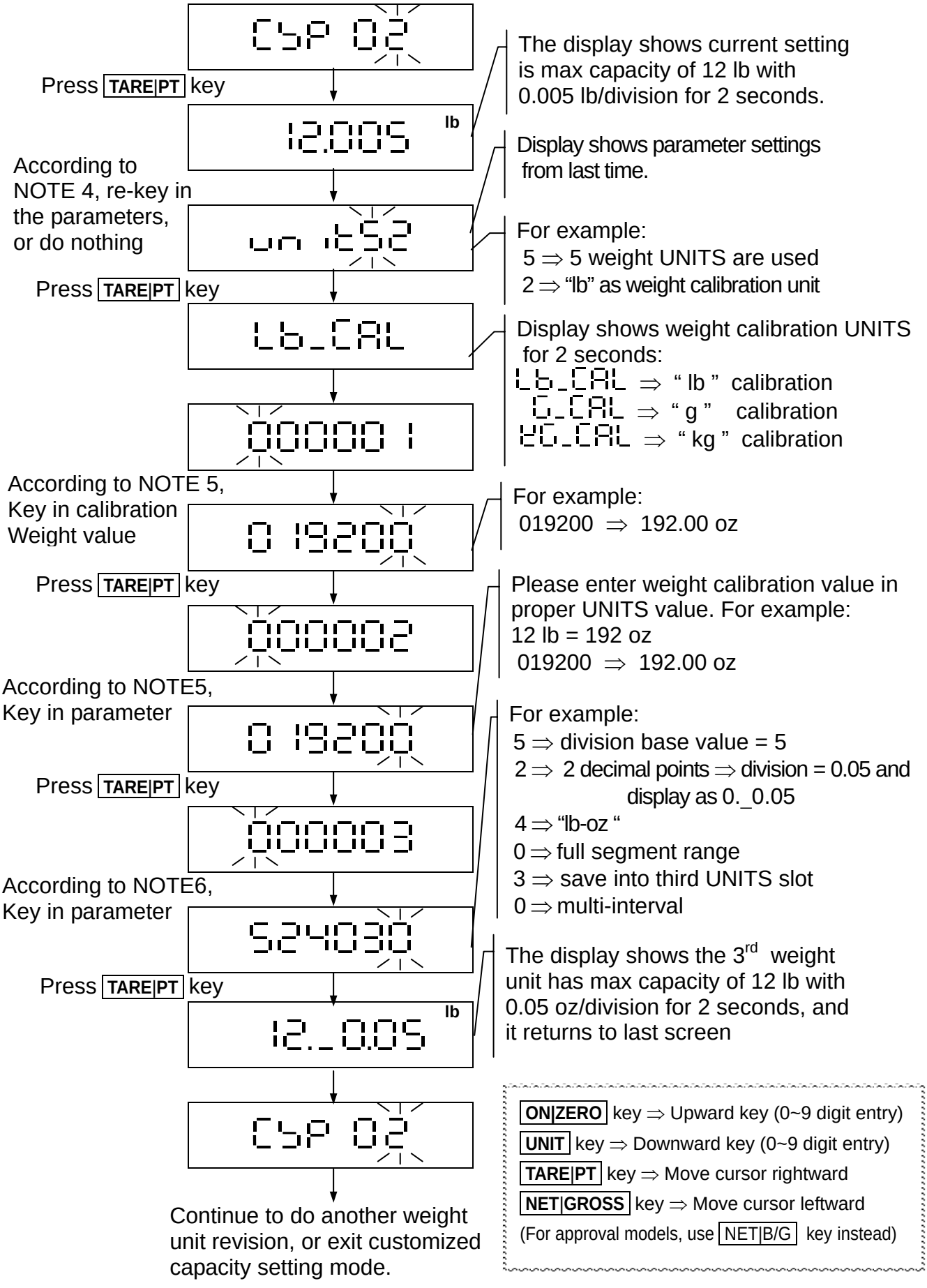
(r) ⇒ Scale change point (Input the parameter 0, 1, 2, or 3)
Parameter description:
0 ⇒ full range
1 ⇒ full range
2 ⇒ dual range (changes at 1/2 of full scale)
3 ⇒ triple range (changes at 1/6 of full scale and 2/3 of full scale)

(s) ⇒ Save the weight units at preferred slots (no more than the number of set weight units)
Parameter description:
1 ⇒ the first slot (the weight calibration unit)
2 ⇒ the second slot
3 ⇒ the third slot
4 ⇒ the fourth slot
5 ⇒ the fifth slot

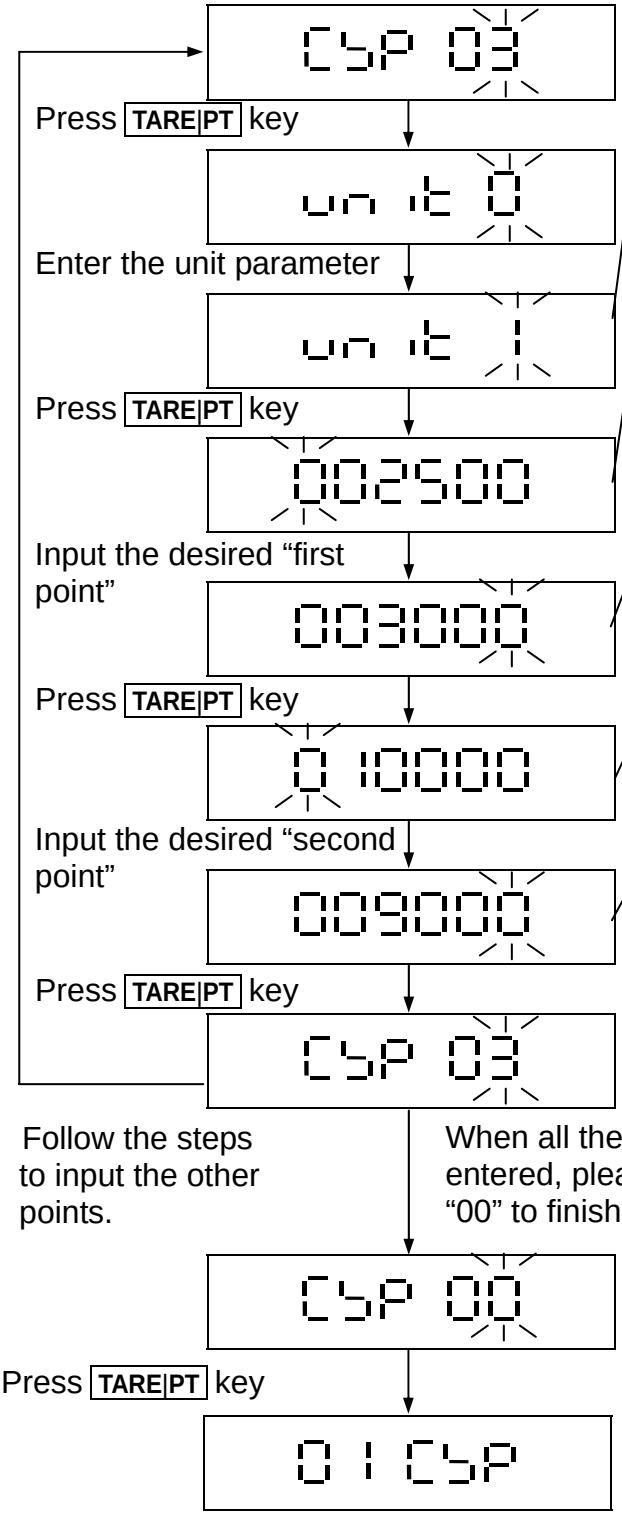
(t) ⇒ 0: multi-interval 1: multi-range

Customized Capacity Setting- How to Revise

To revise customized setting, please follow the steps below



3-1-3 Multi-segment Setting CSP 03



Select the desired unit for setting.

All the units which set at CSP 02, CSP 01 could be selected to set the interval point.

Refer to Note 1 on page 13 for unit setting.

The display shows the first point setting value.

2 segments model ⇒ the point is at 1/2 full scale
3 segments model ⇒ 1st point is at 1/6 full scale
2nd point is at 2/3 full scale

Input the desired "first point".

The first point could be set for the 2 or 3 segments model.

The display shows the second point setting value.

3 segments model ⇒ 1st point is at 1/6 full scale
2nd point is at 2/3 full scale

Input the desired "second point".

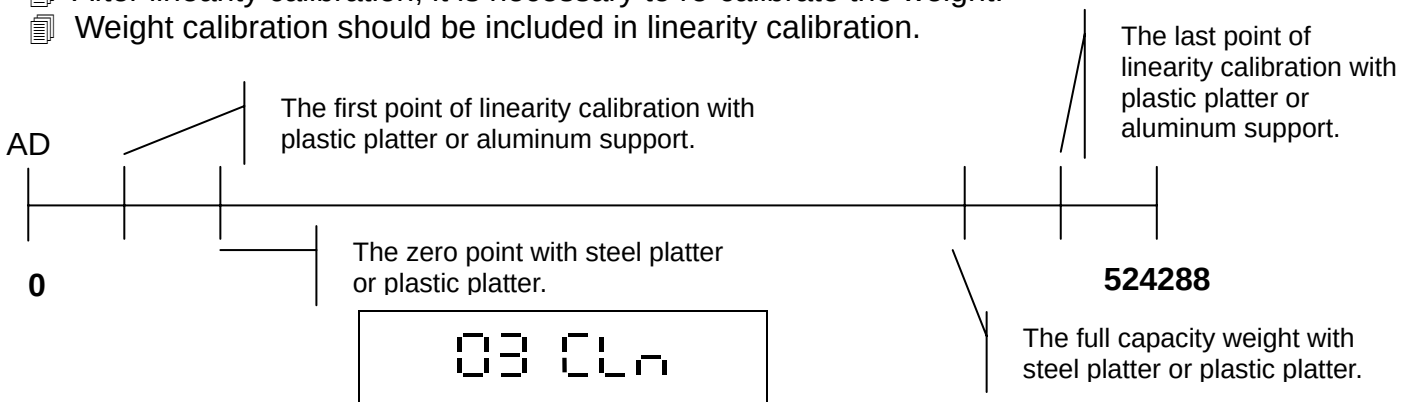
The second point only could be set for the 3 segments model.

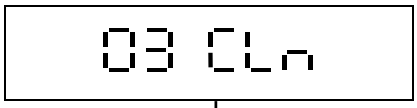
ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

- By the specification setting of CSP 02, CSP 01 the default separation points for the 2 segments model is 1/2 full scale, and 1/6 full scale and 2/3 full scale for the 3 segments model. To change the interval point setting, please use the CSP 03 function.
- When the specification settings of CSP 02 and CSP 01 have been changed, the separation points would be reset to the default setting.

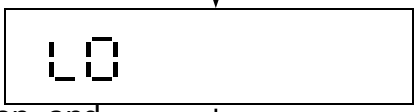
3-2 Linearity Calibration 03 CLn

- After linearity calibration, it is necessary to re-calibrate the weight.
- Weight calibration should be included in linearity calibration.

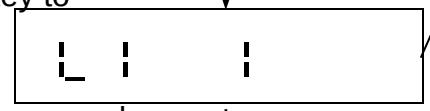




Remove all weight from the pan, Press **TARE|PT** key to enter linearity calibration mode.

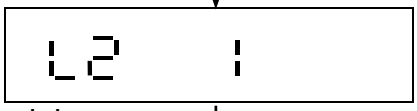


Remove the steel weigh pan, and leave the plastic one, ensure the pan is empty, Press **TARE|PT** key to record the “first point”.

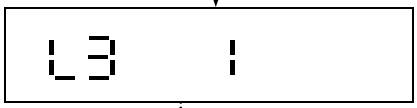


***Weight factor**
Refer to note below

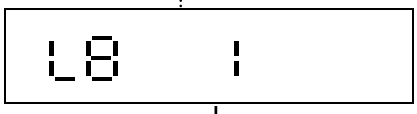
Apply the 1st weight for the second point, enter the weight factor, Press **TARE|PT** key to record the “second point”



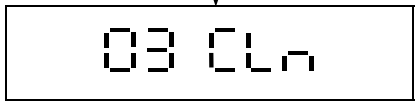
Add 2nd weight, enter the weight factor, Press **TARE|PT** key to record the ”third point”



Add 3rd weight, enter the factor, Press **TARE|PT** key to record the ”forth point”



Add 8th weight, enter weight factor, Press **TARE|PT** key to record the ”ninth point”



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Enter
NET|GROSS key ⇒ ESC
(For approval models, use NET|B/G key instead)

Weight factor

The weight factor is a single hexadecimal number which represents the value of the next weight compared to the size of the first weight applied to the scale.
The weight factor is arranged as follows:-
1 = The weights are equal.
2 = The next weight is twice as big as the first weight
3 = 3 times as big as the first weight
4 = 4 times…
5 = 5 times …
6 = 6 times..
7 = 7 times…
8 = 8 times…
9 = 9 times….
A = 10 times…
B = 11 times…
C = 12 times…
D = 13 times…
E = 14 times…
F = 15 times as big as the first weight

Exampes: 30kg scale to be linearitied with the weight values shown in brackets:

Ex1: 30kg (10kg ,10kg ,10kg)

Display	Key Press	Note
03 CLn	TARE	Into linearity calibration
L0	TARE	First point (zero), remove weigh pan and press the Tare key
L1 1	TARE	Put 10kg on and press the Tare key
L2 1	TARE	Put 10kg on and press the Tare key
L3 1	TARE	Put 10kg on and press the Tare key
L4 1	NET/GROSS	To finish linearity adjustment (4 points linearity calibration)
03 CLn		

Ex2: 30kg (5kg, 10kg ,10kg, 5kg)

Display	Key Press	Note
03 CLn	TARE	Into linearity calibration
L0	TARE	First point (zero), remove weigh pan and press the Tare key
L1 1	TARE	Put 5kg on and press the Tare key
L2 2	TARE	Put 10kg on and press the Tare key, 2 is the rate of L1 (10kg is 2 x 5kg, which was used in L1)
L3 2	TARE	Put 10kg on and press the Tare key
L4 1	TARE	Put 5kg on and press the Tare key
L5 1	NET/GROSS	To finish linearity adjustment (5 points linearity calibration)
03 CLn		

Ex3: 30kg (5kg, 5kg ,10kg, 10kg)

Display	Key Press	Note
03 CLn	TARE	Into linearity calibration
L0	TARE	First point (zero), remove weigh pan and press the Tare key
L1 1	TARE	Put 5kg on and press the Tare key
L2 1	TARE	Put 5kg on and press the Tare key
L3 2	TARE	Put 10kg on and press the Tare key
L4 2	TARE	Put 10kg on and press the Tare key
L5 1	NET/GROSS	To finish linearity adjustment (5 points linearity calibration)
03 CLn		

Ex4: 30kg (1kg, 2kg ,5kg, 10kg, 2kg, 10kg)

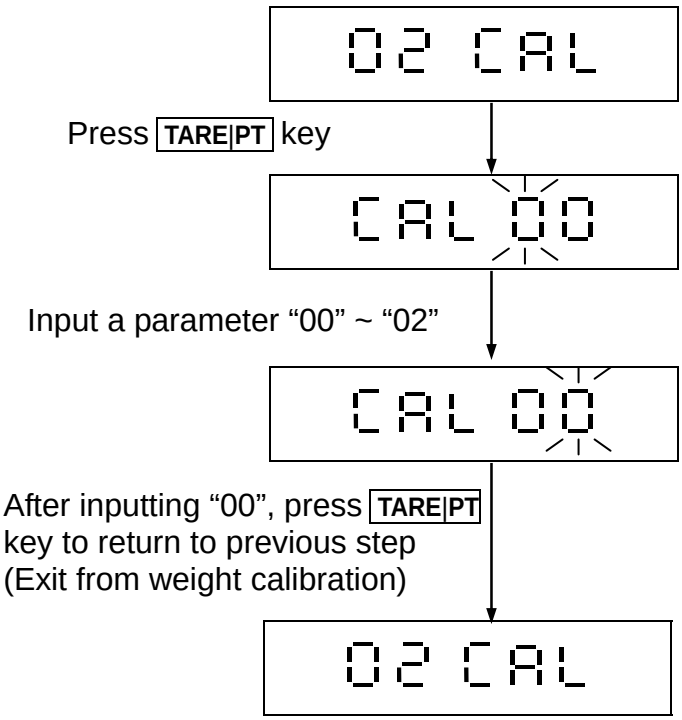
Display	Key Press	Note
03 CLn	TARE	Into linearity calibration
L0	TARE	First point (zero), remove weigh pan and press the Tare key
L1 1	TARE	Put 1kg on and press the Tare key
L2 2	TARE	Put 2kg on and press the Tare key
L3 5	TARE	Put 5kg on and press the Tare key
L4 A	TARE	Put 10kg on and press the Tare key
L5 2	TARE	Put 2kg on and press the Tare key
L6 A	TARE	Put 10kg on and press the Tare key
L7 1	NET/GROSS	To finish linearity calibration (7 points linearity calibration)
03 CLn		

- In the process of L0, L 1, press NET|GROSS key (For approval models, use NET | B/G key instead) to abort the linearity calibration.

- In the process of L2, L3, L4, L5, L6, L7, or L8 press NET|GROSS key (For approval models, use NET|B/G key instead) to finish and save the 2, 3, 4, 5, 6, 7, or 8 points calibration.

- In the process of L8, press TARE|PT key to finish and save the 9 points calibration.

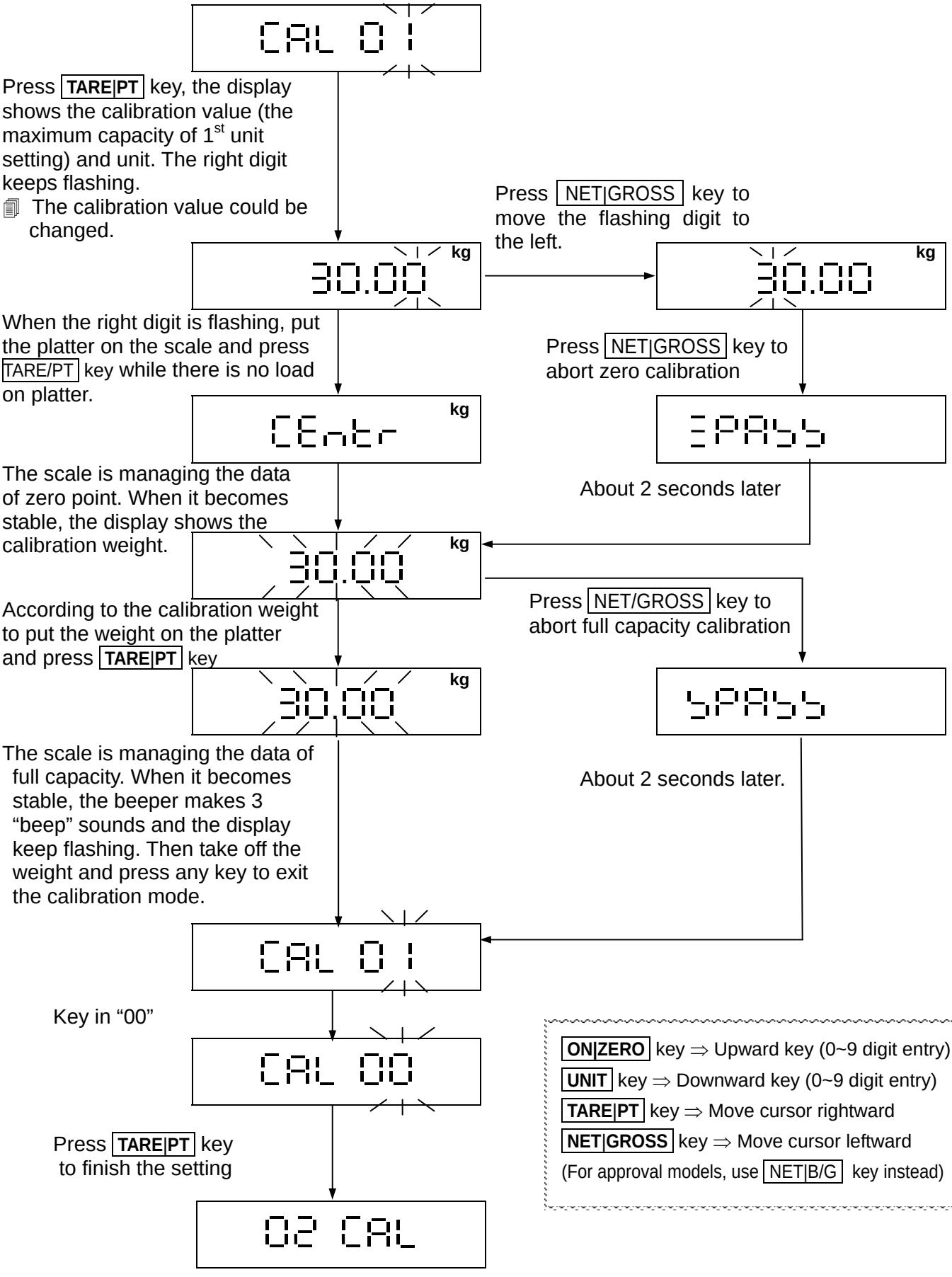
3-3 Weight Calibration 02 CAL



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

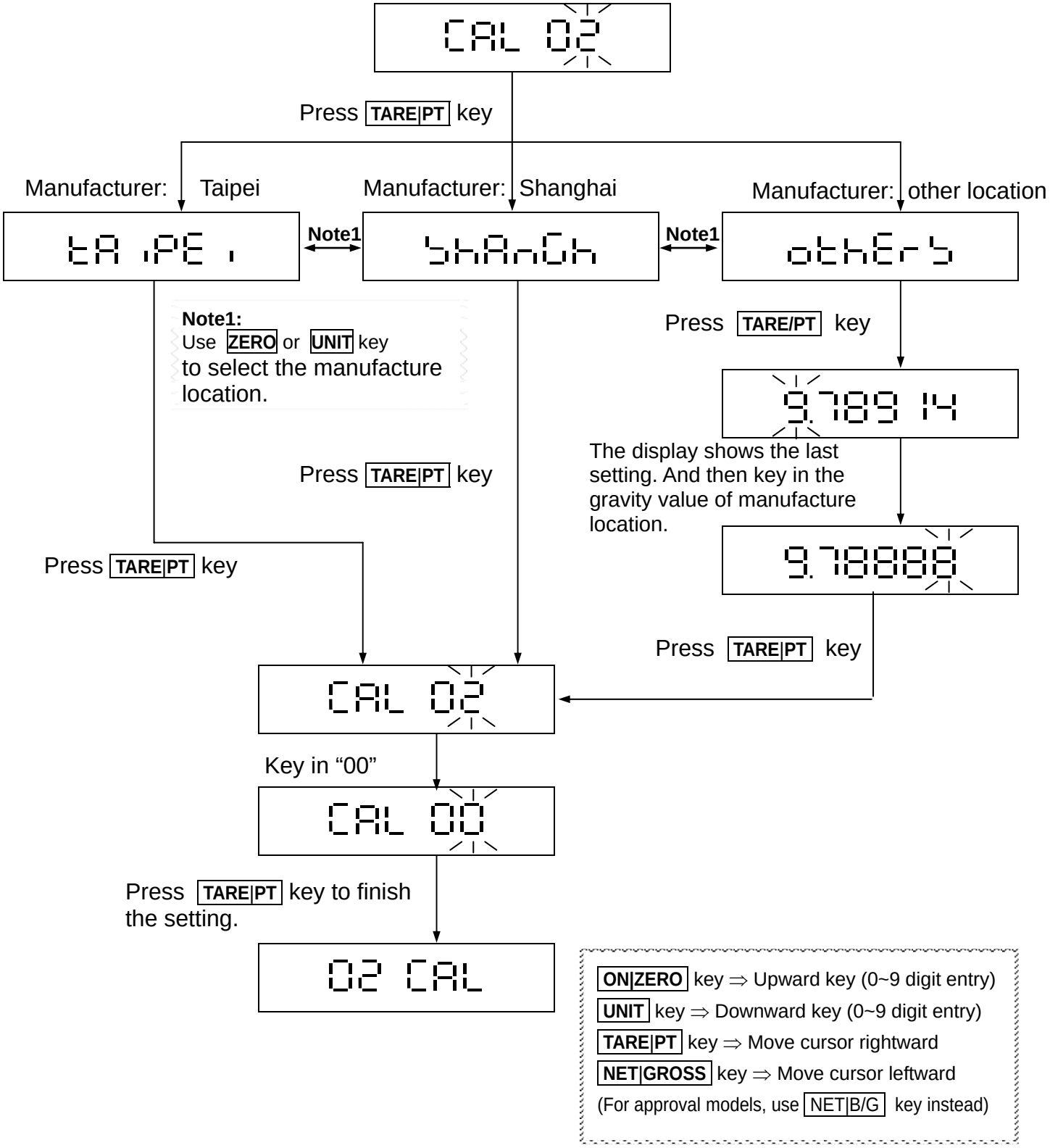
CAL 00 ⇒ Return to Previous Step
CAL 01 ⇒ Weight Calibration
CAL 02 ⇒ Local Gravity Setting

3-3-1 Weight Calibration Setting CAL 01

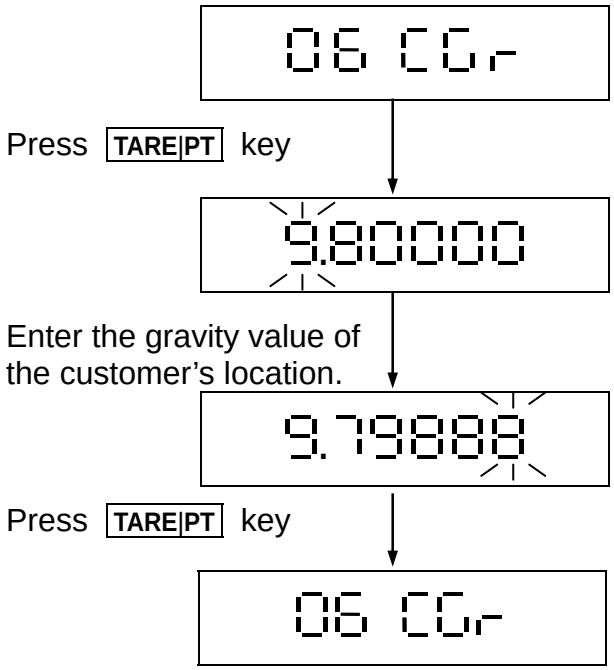


3-3-2 Manufacturing Location Gravity Setting CAL 02

- The gravity value should be among the value of Equator and Polar.
  Equator gravity G_E = 9.7803184558 m/sec^2 Polar gravity G_P = 9.8321772792 m/sec^2
  Taipei ≒ 9.78914 m/sec^2 Shanghai ≒ 9.79423 m/sec^2



3-4 Local Gravity Setting 06 CGr

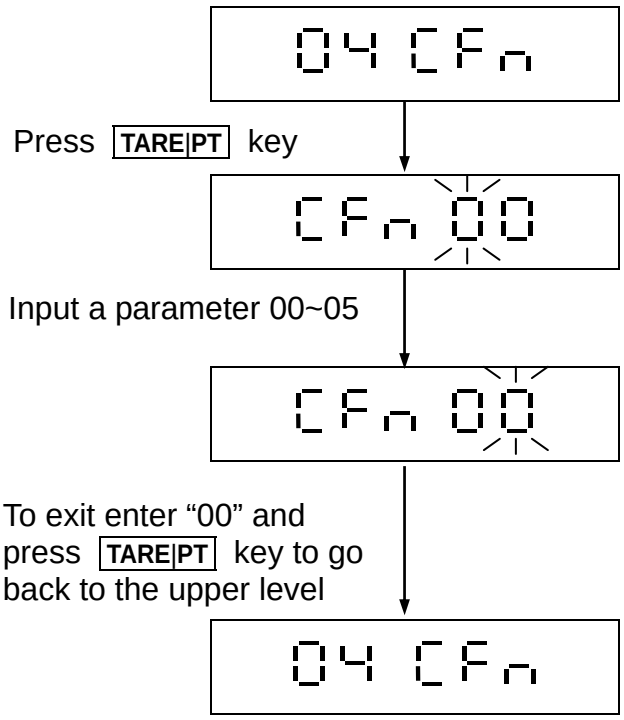


ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

The gravity value should be among the value of Equator and Polar.

Acceleration of gravity at the Equator: $G_E = 9.7803184558$ m/sec^2
Acceleration of gravity at the Poles: $G_P = 9.8321772792$ m/sec^2
Taipei ≒ 9.78914 m/sec^2 Shanghai ≒ 9.79423 m/sec^2

3-5 Function Setting 04 CFn

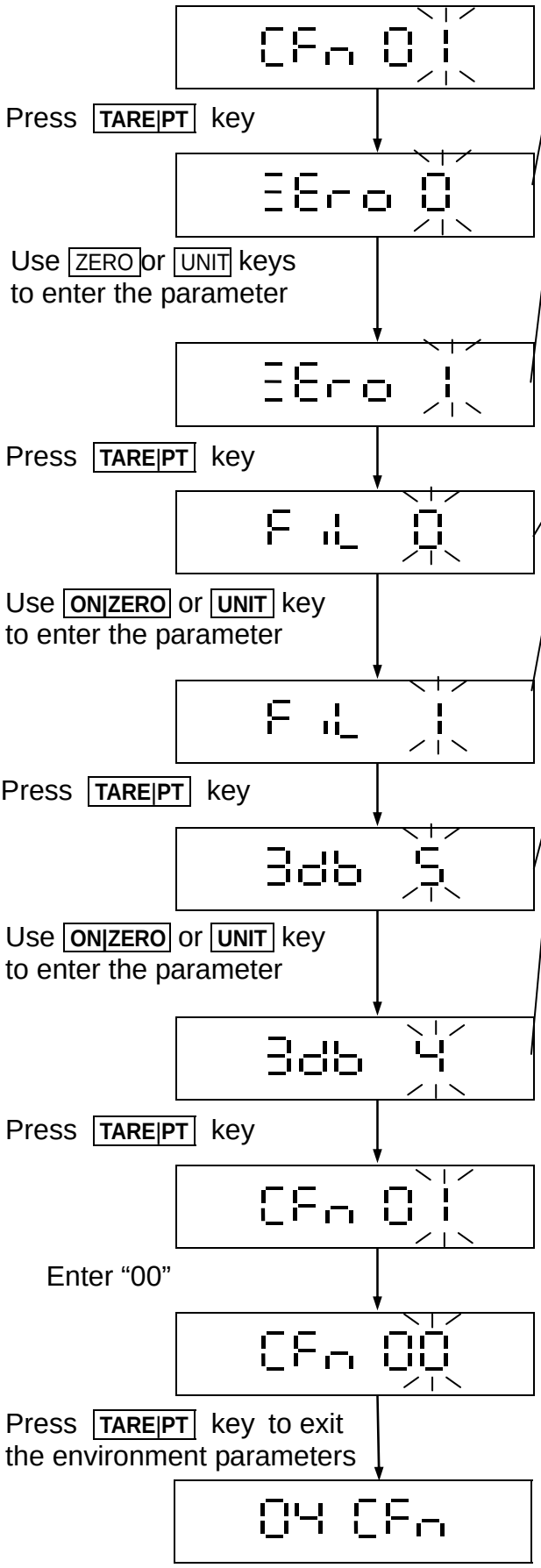


ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

CFn 00 ⇒ Back to the upper level
CFn 01 ⇒ Environment parameters
CFn 02 ⇒ Approval configuration
CFn 04 ⇒ Initial Zero Setting
CFn 05 ⇒ Hold Function Setting
CFn 06 ⇒ Zero Tracing Setting

3-5-1 Environment Parameters CFn 01

If parameters are changed in CFn 01, then FnC 05 will be revised automatically



Return to zero
The display shows the last setting

Return to zero point
Using ZERO or UNIT to enter
- Default setting = 0

0 ⇒ show all 5 ⇒ within 5 d
1 ⇒ within 1 d 6 ⇒ within 6 d
2 ⇒ within 2 d 7 ⇒ within 7 d
3 ⇒ within 3 d 8 ⇒ within 8 d
4 ⇒ within 4 d 9 ⇒ within 9 d

Weight value must over **1/3 full scale**

Stabilization range
Display shows the last setting

Stabilization range
Use ON|ZERO or UNIT key to input the parameters.
- Default setting = 0

Parameter 0 ~ 9, the larger the number the more stable the weight.

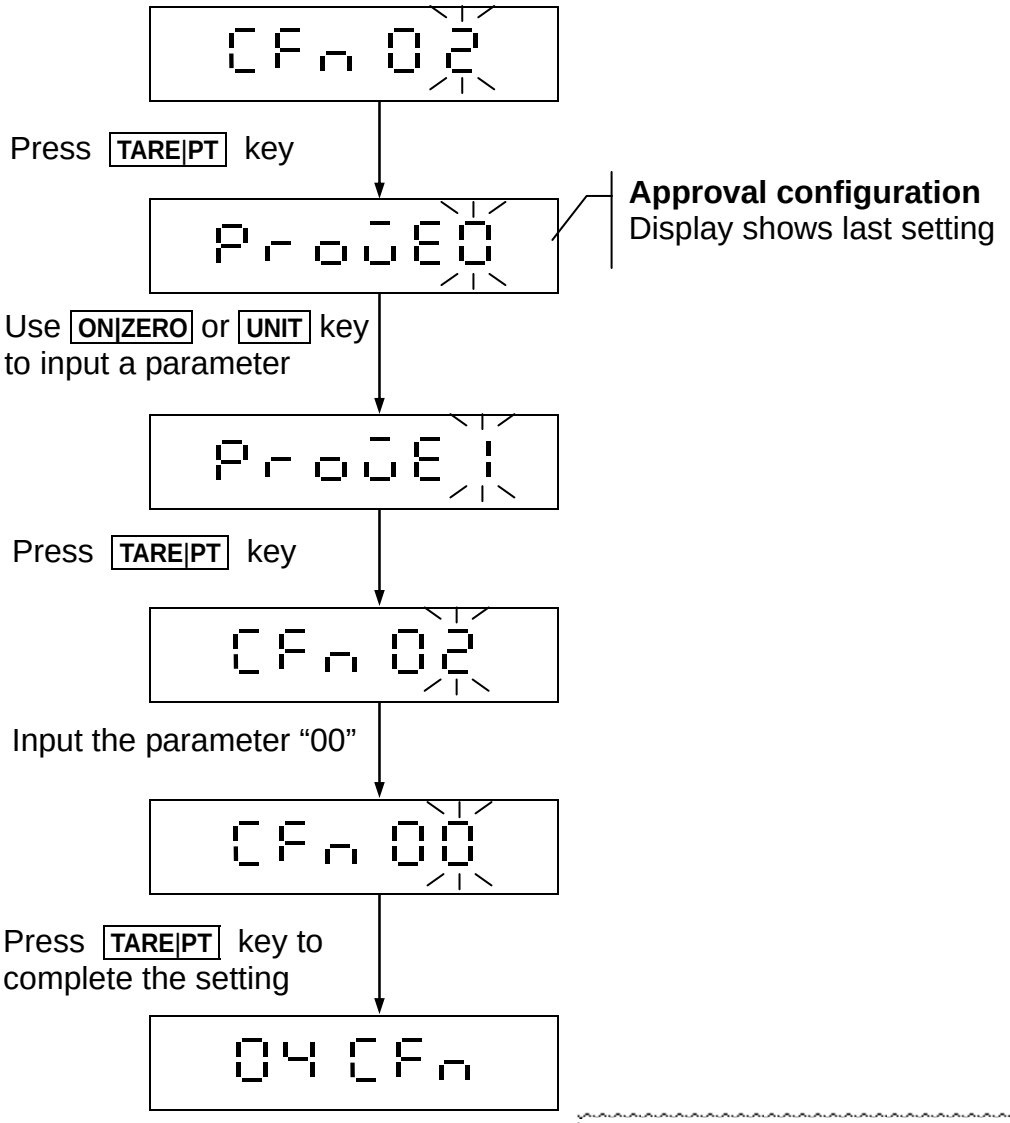
Filter setting
Display shows the last setting.

Weighing Filter setting
Use ON|ZERO or UNIT key to input the parameters.
- Default setting = 5

Range 0 ~ 9, the larger the number, the faster the filter response. Fast response could lead to display weight instability.
Parameter 9 → the AD value is not filtered.
Input AD value = Output AD value

ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

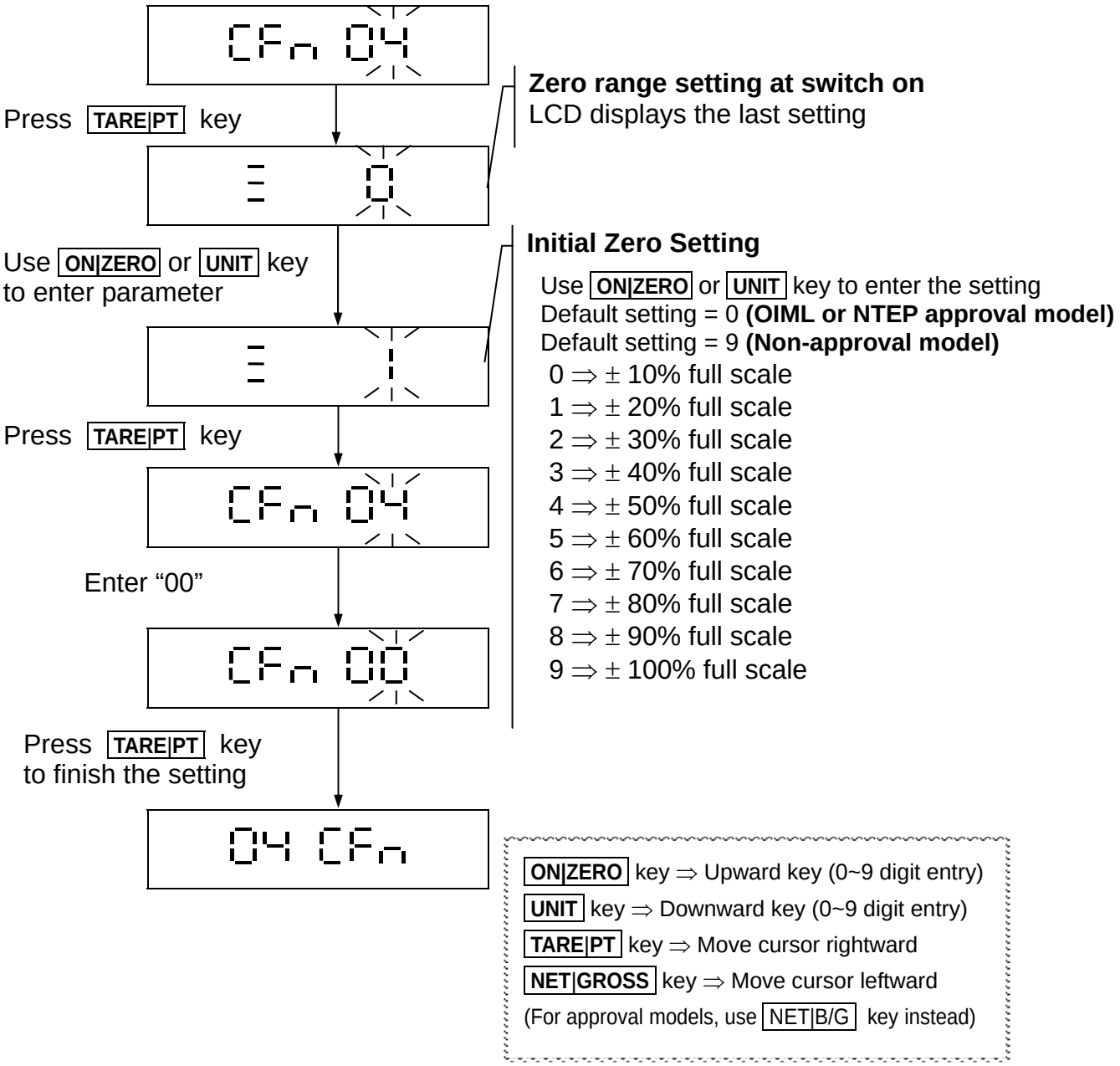
3-5-2 Approval Configuration CFn 02



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

Brazil approved model: In the counting mode, the indicator is not able to calculate the count value if the unit weight is less than 0.1e. It will be showing “------“.

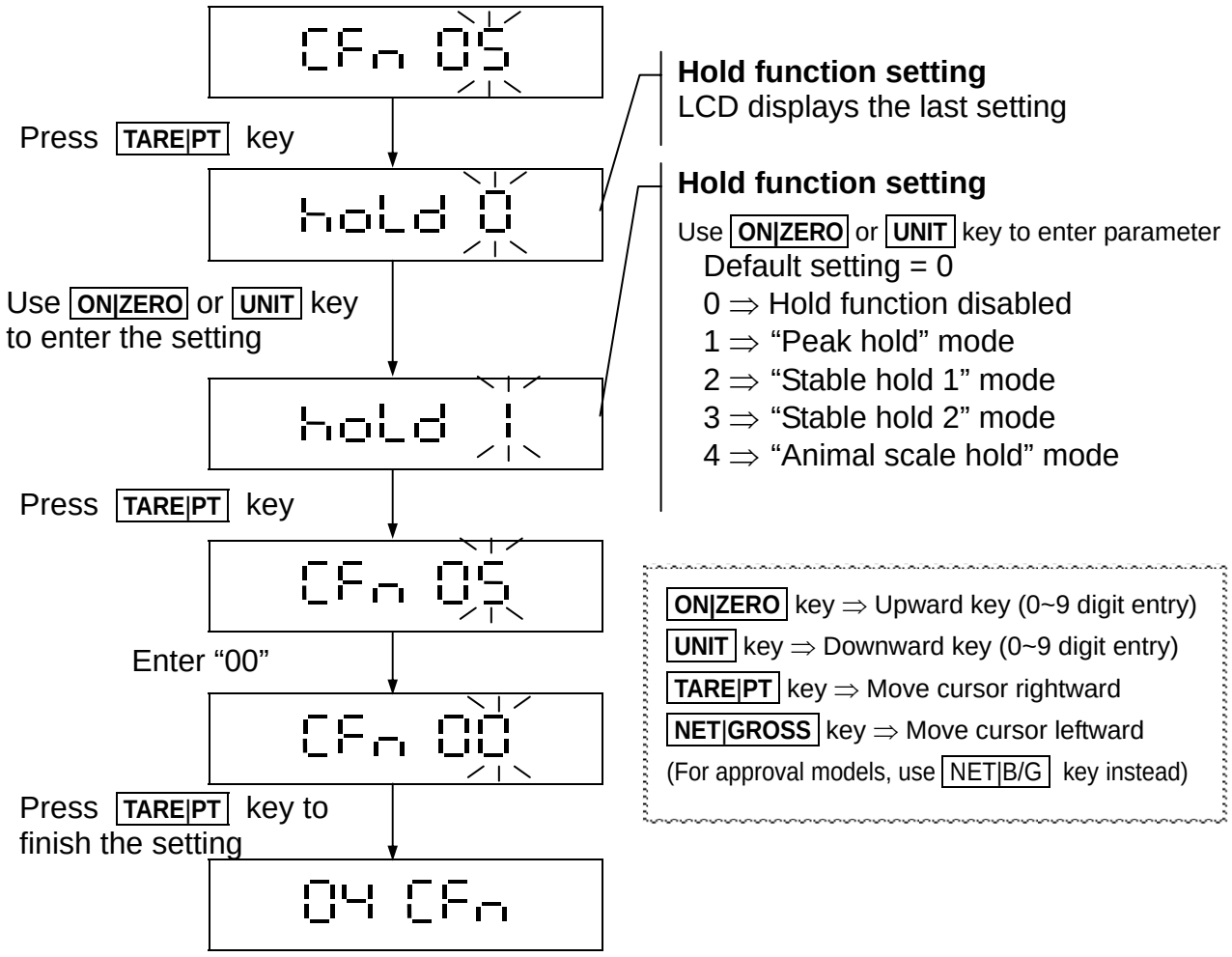
3-5-3 Initial Zero Setting CFn 04



OIML or NTEP approval model (CFn 02 setting is "1"), and the initial zero setting is: ± 10% of full scale

Non-approval model (CFn 02 setting is "0"), and the initial zero setting is: ± 100% full scale

3-5-4 Hold Function Setting CFn 05



hold 0 = Hold function disabled.

hold 1 = **"Peak hold" mode**

The scale shows the maximum weight value detected from the continuously changing weight values. Press any key to exit the hold function.

hold 2 = **"Stable hold 1" mode**

After the scale is stable, the display shows the current weight value. Press any key to exit the hold function.

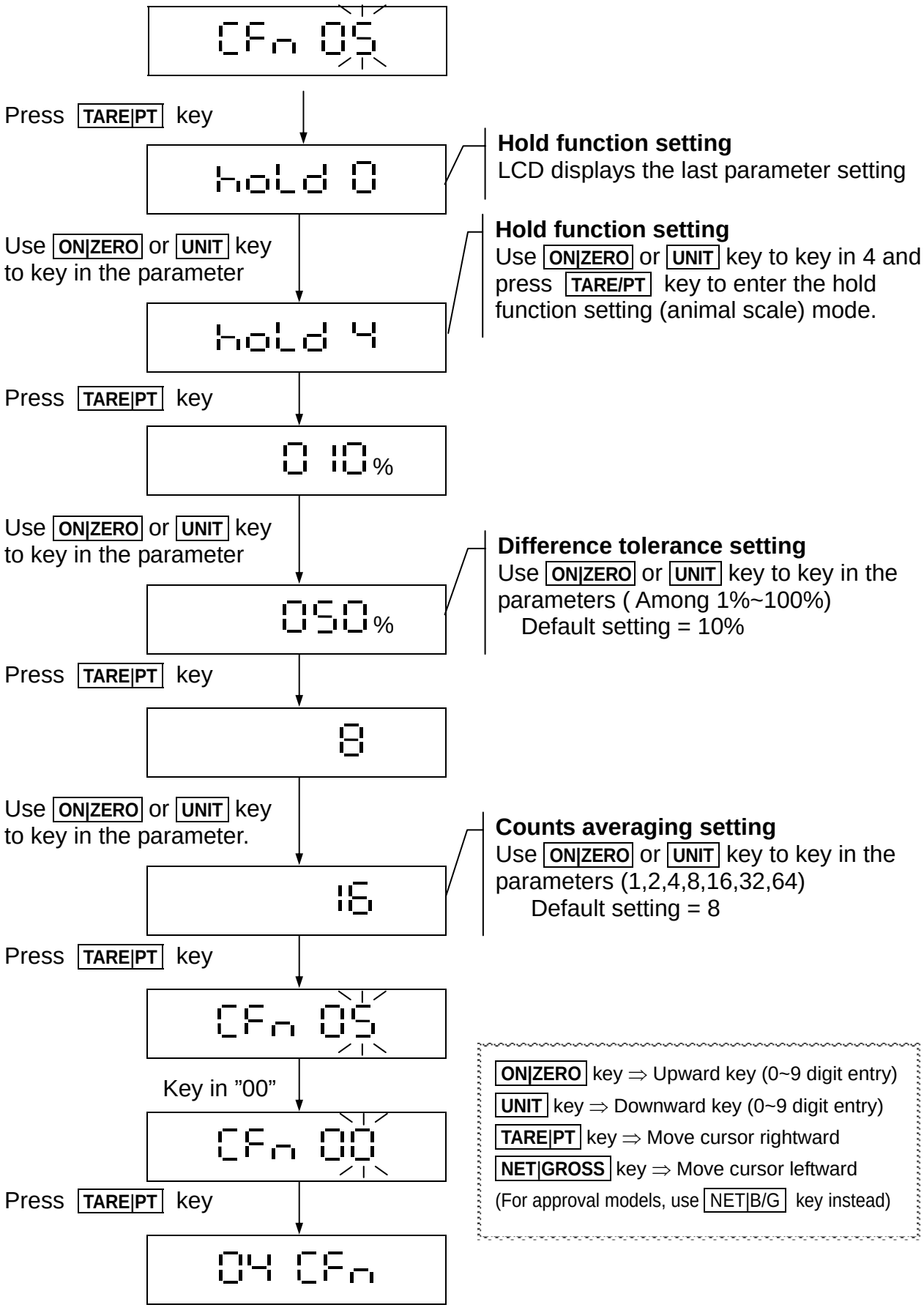
hold 3 = **"Stable hold 2" mode**

After the scale is stable, the display shows the current weight value. Re-zero the scale (or the weight is less than 10e) to exit the hold function.

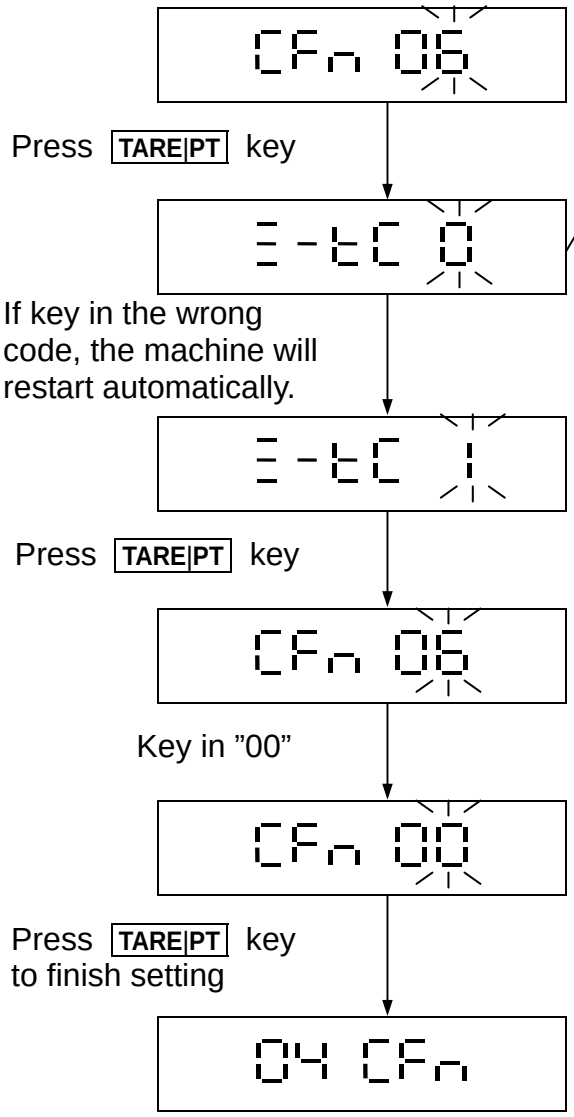
hold 4 =**"Animal scale hold" mode**

When the scale returns back to zero, the display shows " - - - - - - ". After the animal or object is on the platter and the scale becomes stable, the display shows the weight value and hold. Then when the animal or object is off the platter, the display shows " - - - - - - " (or the weight is less than 10e) and the hold function is off. If the scale is hardly stable when the animal is on the platter, the scale shows the average weight in 10 seconds and holds the status.

Hold Function Setting (Animal scale) hold 4



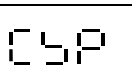
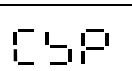
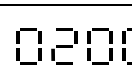
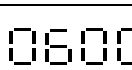
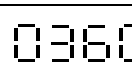
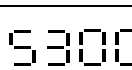
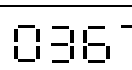
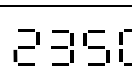
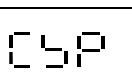
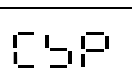
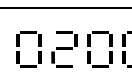
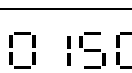
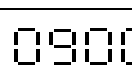
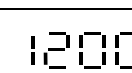
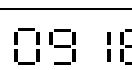
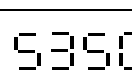
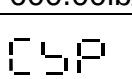
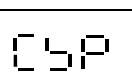
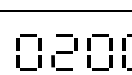
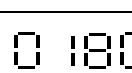
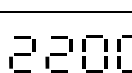
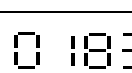
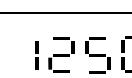
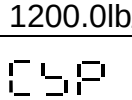
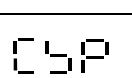
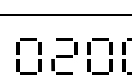
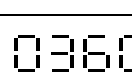
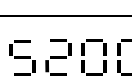
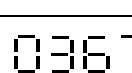
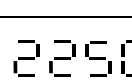
3-5-5 Zero Tracking CFn 06



ON|ZERO key ⇒ Upward key (0~9 digit entry)
UNIT key ⇒ Downward key (0~9 digit entry)
TARE|PT key ⇒ Move cursor rightward
NET|GROSS key ⇒ Move cursor leftward
(For approval models, use NET|B/G key instead)

Burma (viss) capacity setting –Parameter reference table

3.0000kg/0.0002kg 6.0000lb/0.0005lb 1.8000viss/0.0001viss	3.0000kg/0.0002kg 6.0000lb/0.0005lb	1.8000viss/0.0001viss
	CAP 01	CAP 02
	020002	unit30
	030000	018000⇒ **Max. Capacity 1.8000viss**
	240000	018367⇒ **3kg= 1.8367viss**
		145030
6.0000kg/0.0005kg 12.000lb/0.001lb 3.6000viss/0.0002viss	6.0000kg/0.0005kg 12.000lb/0.001lb	3.6000viss/0.0002viss
	CAP 01	CAP 02
	020002	unit30
	060000	036000⇒ **Max. Capacity 3.6000viss**
	540000	036734⇒ **6kg= 3.6734viss**
		245030
15.000kg/0.001kg 30.000lb/0.002lb 9.0000viss/0.0005viss	15.000kg/0.001kg 30.000lb/0.002lb	9.0000viss/0.0005viss
	CAP 01	CAP 02
	020002	unit30
	015000	090000⇒ **Max. Capacity 9.0000viss**
	130000	091836⇒ **15kg= 9.1836viss**
		545030
30.000kg/0.002kg 60.000lb/0.005lb 18.000viss/0.001viss	30.000kg/0.002kg 60.000lb/0.005lb	18.000viss/0.001viss
	CAP 01	CAP 02
	020002	unit30
	030000	018000⇒ **Max. Capacuty 18.000viss**
	230000	018367⇒ **30kg= 18.367viss**
		135030

60.000kg/0.005kg 120.00lb/0.01lb 36.000viss/0.002viss	60.000kg/0.005kg 120.00lb/0.01lb	36.000viss/0.002viss
		
		
		 **Max. Capacity 36.000viss**
		 **3kg= 36.734viss**
		
150.00kg/0.01kg 300.00lb/0.02lb 90.000viss/0.005viss	150.00kg/0.01kg 300.00lb/0.02lb	90.000viss/0.005viss
		
		
		 **Max. Capacity 90.000viss**
		 **150kg= 91.836viss**
		
300.00kg/0.02kg 600.00lb/0.05lb 180.00viss/0.01viss	300.00kg/0.02kg 600.00lb/0.05lb	180.00viss/0.01viss
		
		
		 **Max. Capacity 180.00viss**
		 **300kg= 183.67viss**
		
600.00kg/0.05kg 1200.0lb/0.1lb 360.00viss/0.02viss	600.00kg/0.05kg 1200.0lb/0.1lb	360.00viss/0.02viss
		
		
		 **Max. Capacity 360.00viss**
		 **600kg= 367.34viss**
		

Command Mode

Command Format A

Host	Command
Slave	Command

MZ	Zero	SO	Command mode
MT	Tare	UA	Switch to the first unit
MG	Gross weight	UB	Switch to the second unit
MN	Net weight	UC	Switch to the third unit
CT	Clear TARE value	UD	Switch to the forth unit
SC	Continuous transmission	UE	Switch to the fifth unit
SA	Auto transmission	UF	Switch to the sixth unit
%	Stop continuous transmission and enter the command mode		

Note: UA ~ UF settings are depended on the model of the scale

Command Format B

Host	Command
Slave	Data

RW	Read current weight	RH	Read Gross (simple)
RG	Read Gross weight	RI	Read Net (simple)
RN	Read Net weight	RJ	Read comparison situation + current display of weight (simple)
RT	Read TARE	RK	Read comparison situation + Gross (simple)
RB	Read current display of weight (simple)	RL	Read comparison situation + Net (simple)

Note: a. add % before the command to read continuously
b. add # before the command to transmit a stable value

RJ,RK,RL Command Description

If RL command entered, and
if weight is higher than HI (FNC 03 setting), and if the current weight is 10 kg, the following will be displayed: “100+ 10.000”
If weight is higher than HI (FNC 03 setting), and if the current weight is 0.5 kg, the following will be displayed: “001+ 0.500”
If weight is between HI and LOW, and if the current weight is 1 kg, the following will be displayed: 010+ 1.000

Read weight comparison setting value RS○○□□

○○: Groups(00 ~ 09) □□: Setting Items

HI	**Show "HI" presetting value**
LO	**Show "LO" presetting value**

Note : ○○(Group) is various depended on different models

00 ⇒ The first group

01 ⇒ The second group

02 ⇒ The third group

EX: RS02LO＜CR＞＜LF＞ Show "LO" presetting value

ANS: RS02LOXXXXXX＜CR＞＜LF＞

Command Format C

Host | Command+ Data

Slave | Command+ Data

Write weight comparison setting value WS○○□□XXXXXX

○○: Groups(00 ~ 09) □□: Setting Items XXXXXX: Setting Value

HI	**Write "HI" setting value**
LO	**Write "LO" setting value**

Note : ○○ (Group) is various depended on different models

00 ⇒ The first group

01 ⇒ The second group

02 ⇒ The third group

EX: WS00HI001000＜CR＞＜LF＞ Write "HI" setting value

ANS: WS00HI001000＜CR＞＜LF＞

Command Format D

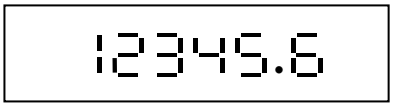
Host | Data

Slave

Value (e.g. Price)						Position of decimal point	CR	LF
1	2	3	4	5	6	1		

When the Slave receives this data format, it will transfer the data and display it on its LCD.

⇩



- The function is effective when the weight value is over 0.
- The above 4 (ABCD) command formats are RS232 bi-directional. There are the following error messages received by Slave terminal (scale).

Error messages:

E1: Wrong command

E2: Command format error (Wrong parameters)

E3: Command not recognised

Output data format

1. 7 places (first decimal place not included)

Weight format

Gross	S	T	,	G	S	,	+	0	1	2	3	4	5	6	7	SP	SP	o	z	CR	LF
Net	S	T	,	N	T	,	+	1	.	2	3	.	4	5	6	t	l	.	g		
Tare	S	T	,	T	R	,	+	0	1	2	.	3	4	5	6	SP	SP	k	g		
Plus OL	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Minus OL	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		

Simple format

G/N	+	1	.	2	3	.	4	5	6	CR	LF
G/N	+	0	1	2	3	4	5	.	6		
G/N	+	0	1	2	.	3	4	5	6		
Plus OL	+	SP	SP	SP	SP	SP	SP	SP	SP		
Minus OL	-	SP	SP	SP	SP	SP	SP	SP	SP		

Comparison status + Simple format

Byte0	Byte1	Byte2	+/-	1	.	2	3	.	4	5	6	CR	LF

Byte0 : HI 30H/31H
Byte1 : OK 30H/31H
Byte2 : LO 30H/31H

2. 6 places (first decimal place not included)

Weight format

Gross	S	T	,	G	S	,	+	1	2	3	4	5	6	7	SP	SP	o	z	CR	LF
Net	S	T	,	N	T	,	+	.	2	3	.	4	5	6	t	l	.	g		
Tare	S	T	,	T	R	,	+	1	2	.	3	4	5	6	SP	SP	k	g		
Plus OL	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Minus OL	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Unstable	U	S	,	G	S	,	+	1	2	3	4	.	5	6	SP	SP	l	b		

Simple format

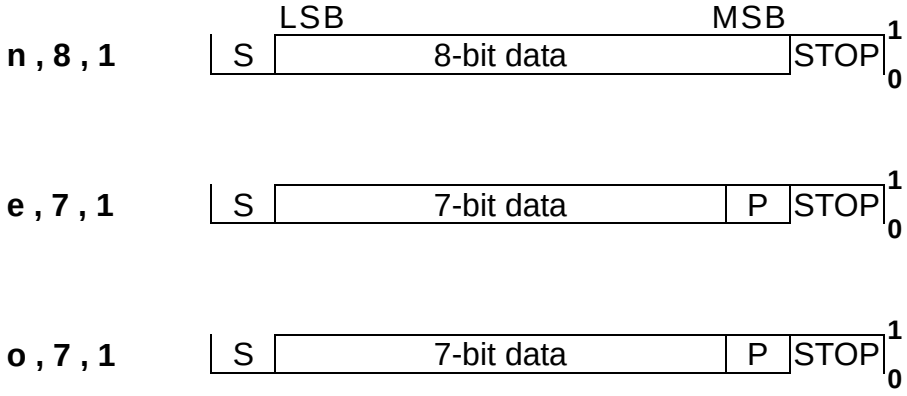
G/N	+	.	2	3	.	4	5	6	CR	LF
G/N	+	1	2	3	4	5	.	6		
G/N	+	1	2	.	3	4	5	6		
Plus OL	+	SP	SP	SP	SP	SP	SP	SP		
Minus OL	-	SP	SP	SP	SP	SP	SP	SP		

Comparison status + simple format

Byte0	Byte1	Byte2	+/-	.	2	3	.	4	5	6	CR	LF

Byte0 : HI 30H/31H
Byte1 : OK 30H/31H
Byte2 : LO 30H/31H

Serial Data Transfer/Receive Format

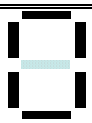
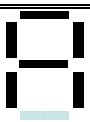
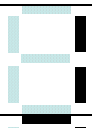
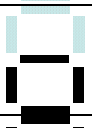
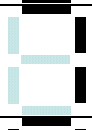
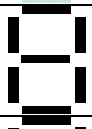
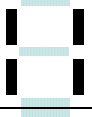


Note:
S : Start bit
STOP: Stop bit
P : Parity bit

Appendix 1 ASCII Code Table

Symbol	ASC II Code	Symbol	ASC II Code	Symbol	ASC II Code
A	41H	a	61H	0	30H
B	42H	b	62H	1	31H
C	43H	c	63H	2	32H
D	44H	d	64H	3	33H
E	45H	e	65H	4	34H
F	46H	f	66H	5	35H
G	47H	g	67H	6	36H
H	48H	h	68H	7	37H
I	49H	i	69H	8	38H
J	4AH	j	6AH	9	39H
K	4BH	k	6BH	↵	0DH
L	4CH	l	6CH		
M	4DH	m	6DH		
N	4EH	n	6EH		
O	4FH	o	6FH		
P	50H	p	70H		
Q	51H	q	71H		
R	52H	r	72H		
S	53H	s	73H		
T	54H	t	74H		
U	55H	u	75H		
V	56H	v	76H		
W	57H	w	77H		
X	58H	x	78H		
Y	59H	y	79H		
Z	5AH	z	7AH		

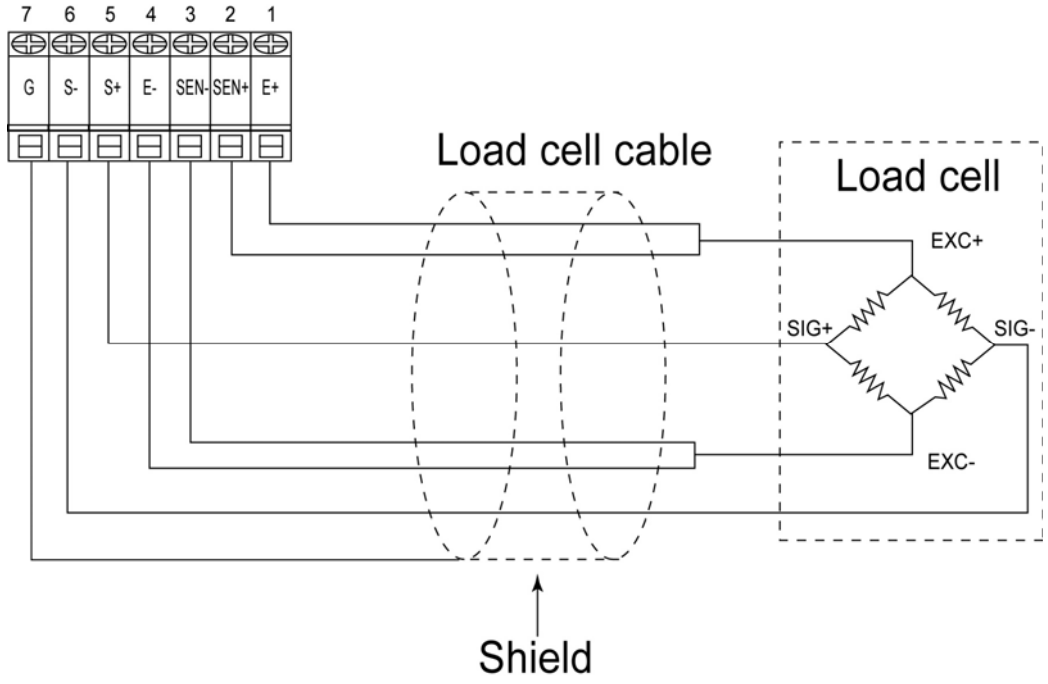
Appendix 2 7-Segment Display Characters

Digit	7 segment letter	Alphabet	7 segment letter	Alphabet	7 segment 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	

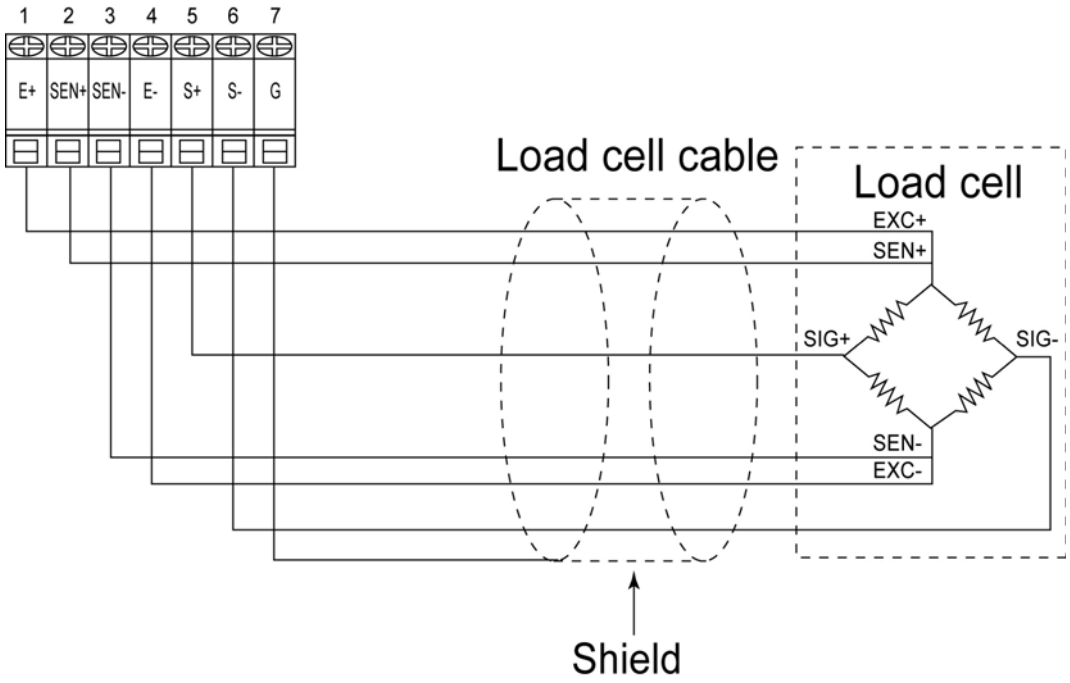
Appendix 3 Wiring Instructions

Load cell wiring method

(1) As shown below, when a load cell is connected with a 4PIN cable, SEN+ and SEN- can be unconnected. J11 and J12 on PCB must be tin-soldered in short circuit.

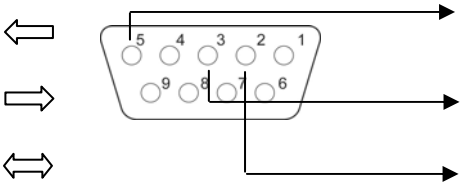


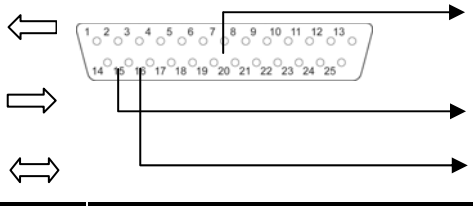
(2) If Load Cell is 6PIN, please wire as the following diagram:



RS232 wiring instruction

To connect RS232, please open the housing, RS232's PIN connectors locate on the bottom-right corner of the main board. The most common connection method is using 9PIN and 25PIN, as shown below:

PC	PIN	Function	Female 9 PINS	Function	PWH3
	2	Transmit Data		SG	
	3	Receive Data		RxD	
	5	Signal Ground		TxD	

Printer	PIN	Function	Male 25 PINS	Function	PWH3
	2	Receive Data		SG	
	3	Transmit Data		RxD	
	7	Signal Ground		TxD	

To use other connection methods, please identify the signal and following the above principles. After it is finished, please install the housing by the instruction in the *SPECIAL NOTICE.*