



EXCELL<sup>®</sup>

EXCELL PRECISION CO., LTD.

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# EX-2001

## NC RACER

# USER MANUAL

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## SAFETY


- 📖 Disconnect the main power supply before opening the indicator housing or disassembling the indicator.
- 📖 In the process of maintenance, please cut off the source if contacting to any electron, socket and groupware for fear of getting an electric shock、 short current and shattering weight controller or error movement.
- 📖 Avoid using the indicator in direct sunlight. The operating ambient temperature range is -10 ~ +40 °C.
- 📖 Use 100 V ~ 240 V AC
- 📖 When using AC source wiring, the front line “L” should be connected to weight controller “L”.  
The neutral line “N” should be connected to weight controller “N”. “” of weight controller should connected to the ground.
- 📖 Connect the ground correctly. (Ground impedance < 100 Ω) Avoid connecting the ground connection with other equipment. The indicator must always be connected to the electrical ground (earth) for safe operation.
- 📖 In the industrial surrounding, the main power supply has non-seasonal and short-lived pulse (high electric current or high voltage) because of high power instrument (start-up and closedown of the source). Users take necessary actions by themselves to protect weight controller and other periphery instrument. (Using isolated transformer or restraining groupware)
- 📖 The weight installation wiring conforms to standard law in the user’s country.
- 📖 When installing, keep the indicator away from noise such as high voltage、 high current and high power switches.
- 📖 The distances of input wiring、 output wiring and power wiring are 30 ~ 50 mm. Try to across vertically if not being separated and avoid being set parallely.
- 📖 The diameter of I/O and BCD wiring is 12 AWG ~ 24 AWG. Please select the proper diameter of the wiring materials. (The length  $\leq$  10 m)
- 📖 Set proper resolution for system installation for fear of decreasing the stability and reliability.
- 📖 When the temperature range is -10 ~ +40 °C and the resolution is over 1 / 3 000, please select the weight load cell passing C3.



## CLEANING TIPS


 Please clean the indicator by alcohol and chemical medicament.




 Clean it with a wet cloth and gentle cleanser and dry it with a soft cloth.




 Do not swash the indicator.

 Do not breakout and maintain the indicator. If there is something wrong with the indicator, please contact your supplier.
















 Keep away from high temperature, damp or direct sunlight conditions.



 Do not shake the indicator fiercely.





# CHAPTER 1 OPERATION GUIDE


FUNCTION	OPERATION PROCEDURE	DESCRIPTION
General function setting	Press and hold the  key, then press the 	Refer to Chapter 9 Functions Table to set FUNC. 0 ~ FUNC. 7
Capacity parameter setting	Switch the capacity calibration switch to "ON" and then press the 	Set the parameter for decimal point, max. capacity, min. division, zero tracking, unstable detection Refer to < 5-1 > Parameter Setting
Calibration	Switch the capacity calibration switch to "ON" and then press the 	Calibration procedures. Refer to < 5-2 > Calibration Setting
Self-diagnosis mode	Turn on the indicator, press and hold  and  the indicator starts the self-test procedure.	Refer to < 8-3 > Self-diagnosis Mode for details
Reset all parameters back to default	Switch the calibration switch to "ON", turn on the indicator, press and hold  and  while the indicator is in the self-testing sequence	Refer to < 8-1 > Reset All Parameter Back to Default
Reset general function parameter back to factory standard setting	Turn on the indicator, press and hold  , followed by pressing  while the indicator is in the self-testing sequence	Refer to < 8-2 > Reset General Function Parameter Back to Default
Display software version	Turn on the indicator, press and hold the  while the indicator is in the self-test sequence	The main display section displays the software version, press any key to exit
Function parameter setting	Press and hold  , followed by pressing 	HI, LO, Zero Band parameter setting





## Operation of Keys in the Setting Mode


 ⇒ Increase the number of the flashing digit by one

 ⇒ Decrease the number of the flashing digit by one

 ⇒ Shift the flashing digit one space to left

 ⇒ Shift the flashing digit one space to right

 ⇒ Save the settings

 ⇒ Exit the settings





## CHARTER 2 SPECIFICATIONS

### ANALOGUE

- ◆ Load cell excitation : DC 5 V  $\pm$  5%, 120 mA (up to 8  $\times$  350  $\Omega$  load cells)
- ◆ Maximum signal voltage : 20 mV
- ◆ Input sensitivity : 0.3  $\mu$ V / D (minimum)
- ◆ Conversion rate : Approximately 120 times/s (maximum)
- ◆ Internal Resolution : 19 bits

### DIGITAL

- ◆ Main display : 7 digits, bright red LED, 20 mm, 7-segment
- ◆ Status display : 6 character display, bright red LED
- ◆ Display update rate : 50 times/s
- ◆ Display capacity : -199 999 to 999 999
- ◆ Min division : 1、 2、 5、 10、 20、 50
- ◆ Decimal point : 0、 0.0、 0.00、 0.000、 0.0 000
- ◆ Memory : Calibration parameters and function settings saved in EEPROM



## INTERFACE

- ◆ OP-01 RS-422 / RS-485
- ◆ OP-02-1 Parallel BCD output ( TTL )
- ◆ OP-02-2 Parallel BCD output ( O.C. )
- ◆ OP-03 Analog output ( 4 ~ 20 mA )
- ◆ OP-05 Parallel Printer output / RS-232C & CURRENT LOOP
- ◆ OP-05 Free Form
- ◆ OP-06 RS-232C & CURRENT LOOP
- ◆ OP-07 RS-232C & CURRENT LOOP & Data Clock Output
- ◆ OP-08 Control I / O ( 2I / 4O )

## POWER SUPPLY INPUT

- ◆ AC Power : 100 V ~ 240 V
- ◆ Power consumption: Approximately 10 W

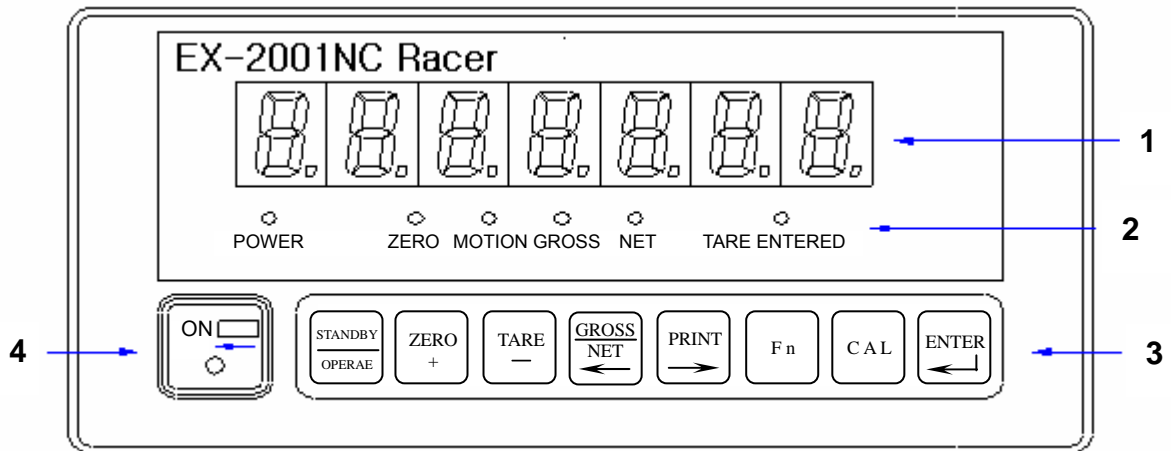
## OTHER

- ◆ Operating temperature and humidity range : -10 ~ 40 °C , < 85 % RH
- ◆ Dimension (mm) : 210 ( W ) × 108 ( H ) × 207 ( D )
- ◆ Weight : Approximately 1.7 kg



# CHAPTER 3 FRONT AND REAR PANEL

## 3-1 FRONT PANEL



### 1 MAIN DISPLAY

- Displays gross weight or net weight

### 2 STATUS INDICATION LIGHTS

☀	POWER	:	Power Indication
☀	ZERO	:	Zero status indication
☀	MOTION	:	Unstable weighing indication
☀	GROSS	:	Main display section currently displays gross wt.
☀	NET	:	Main display section currently displays net wt.
☀	TARE ENTERED	:	Tare indication

### 3 KEYS

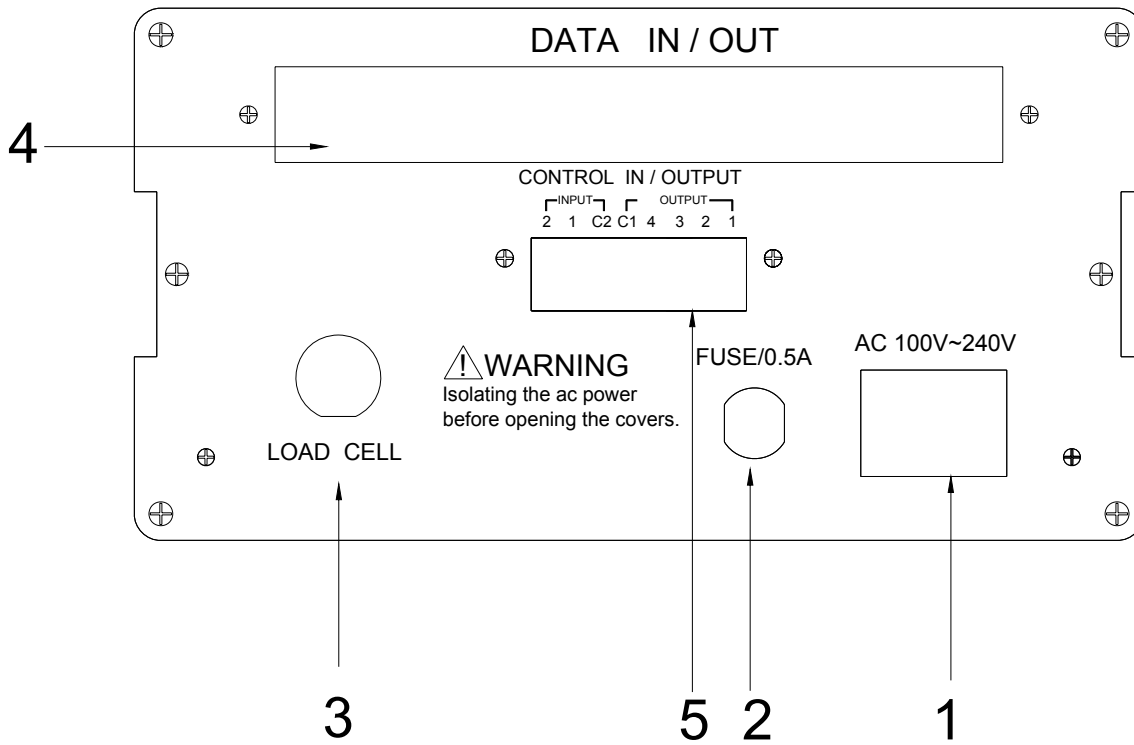
	1) Standby mode ON / OFF 2) When setting the parameter or calibration, it works as quit or exit from setting
	1) Sets weight back to zero 2) When setting the parameter or calibration, it cycles from 0 to 9
	1) Tare function 2) When setting the parameter or calibration, it cycles from 9 to 0
	1) Switches between gross wt. / net wt. on the main display 2) When setting the parameter or calibration, it shifts the flashing character to the left
	1) Manually output serial / parallel data 2) When setting the parameter or calibration, it shifts the flashing character to the right
	1) Weight accumulation, sub-total function (for OP-05) 2) Sets capacity parameter
	1) Weight accumulation, grand-total function (for OP-05) 2) Capacity calibration
	Confirmation key



#### 4 CAPACITY PARAMETER & CALIBRATION SWITCH

Slide the switch to the left is "ON" and Slide the switch to the right is "OFF"

### 3-2 REAR PANEL

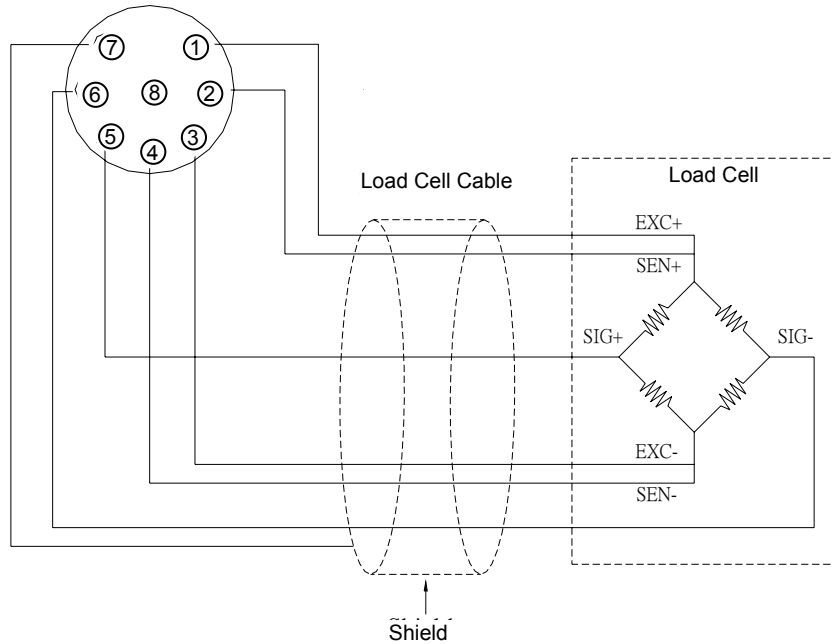


1. AC power in terminal
2. Fuse 250 V / 0.5 A
3. Load cell connector
4. Optional interface location (if fitted)
5. Control I/O Interface location



# CHAPTER 4 INSTALLATION

## 4-1 LOAD CELL



### Four-wire (five-wire) load cell

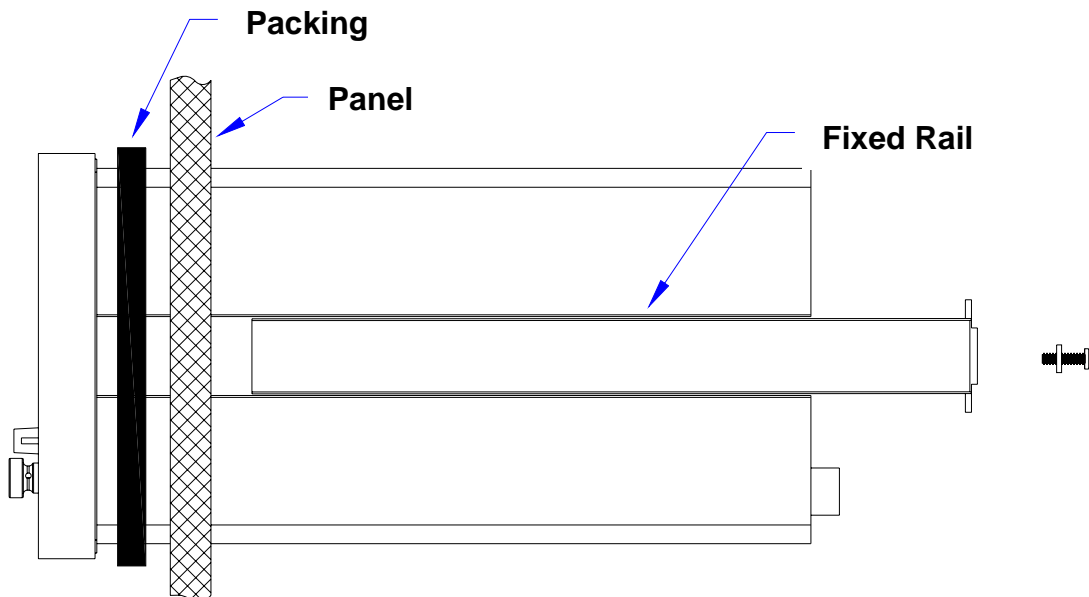
- Pin 1 & 2 short, connected to EXC+
- Pin 3 & 4 short, connected to EXC-
- Pin 5 connected to SIG+
- Pin 6 connected to SIG-
- Pin 7 connected to the Shield

### Six-wire (seven-wire) load cell

- Pin 1 connected to EXC+
- Pin 2 connected to SEN+
- Pin 3 connected to EXC-
- Pin 4 connected to SEN-
- Pin 5 connected to SIG+
- Pin 6 connected to SIG-
- Pin 7 connected to the Shield

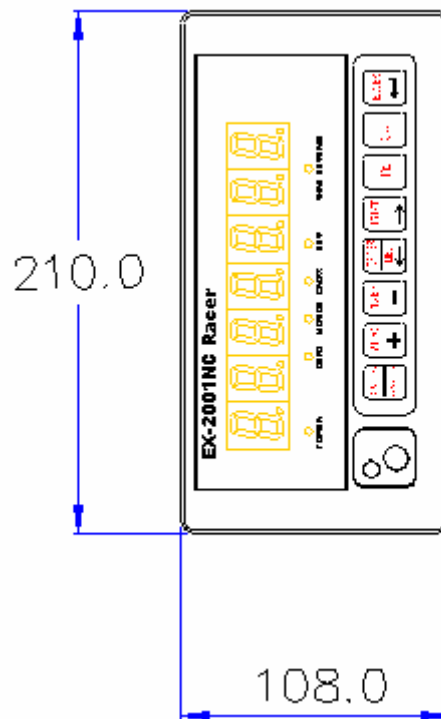
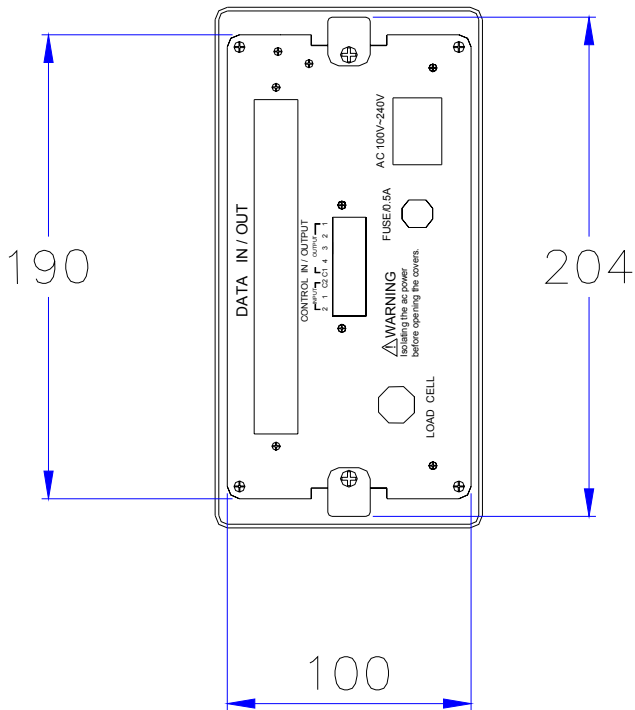
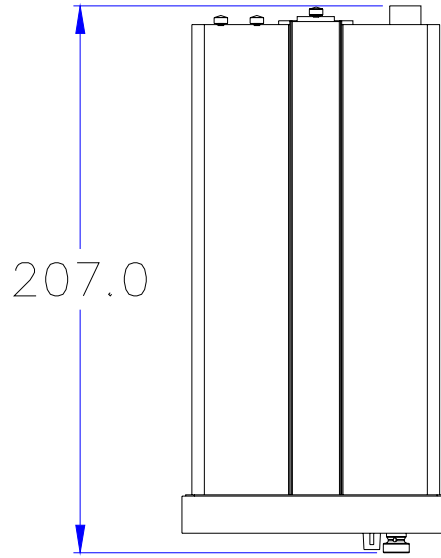
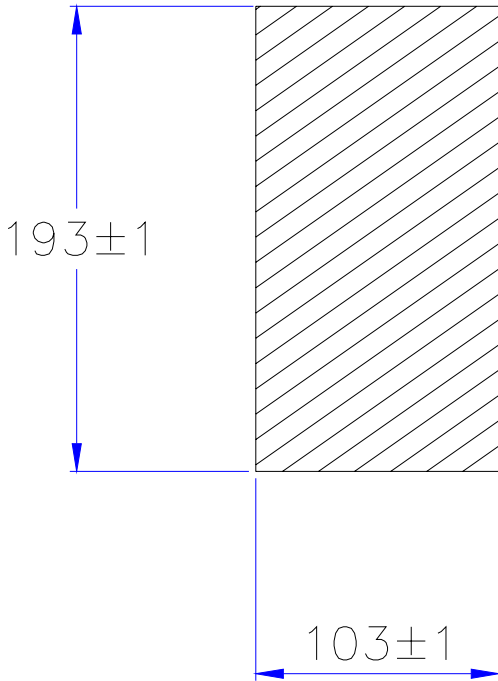
## 4-2 INDICATOR INSTALLATION AND DIMENSIONS

☐ The indicator can be installed in a control panel as detailed below





### INDICATOR DIMENSIONS (measurement unit: mm)






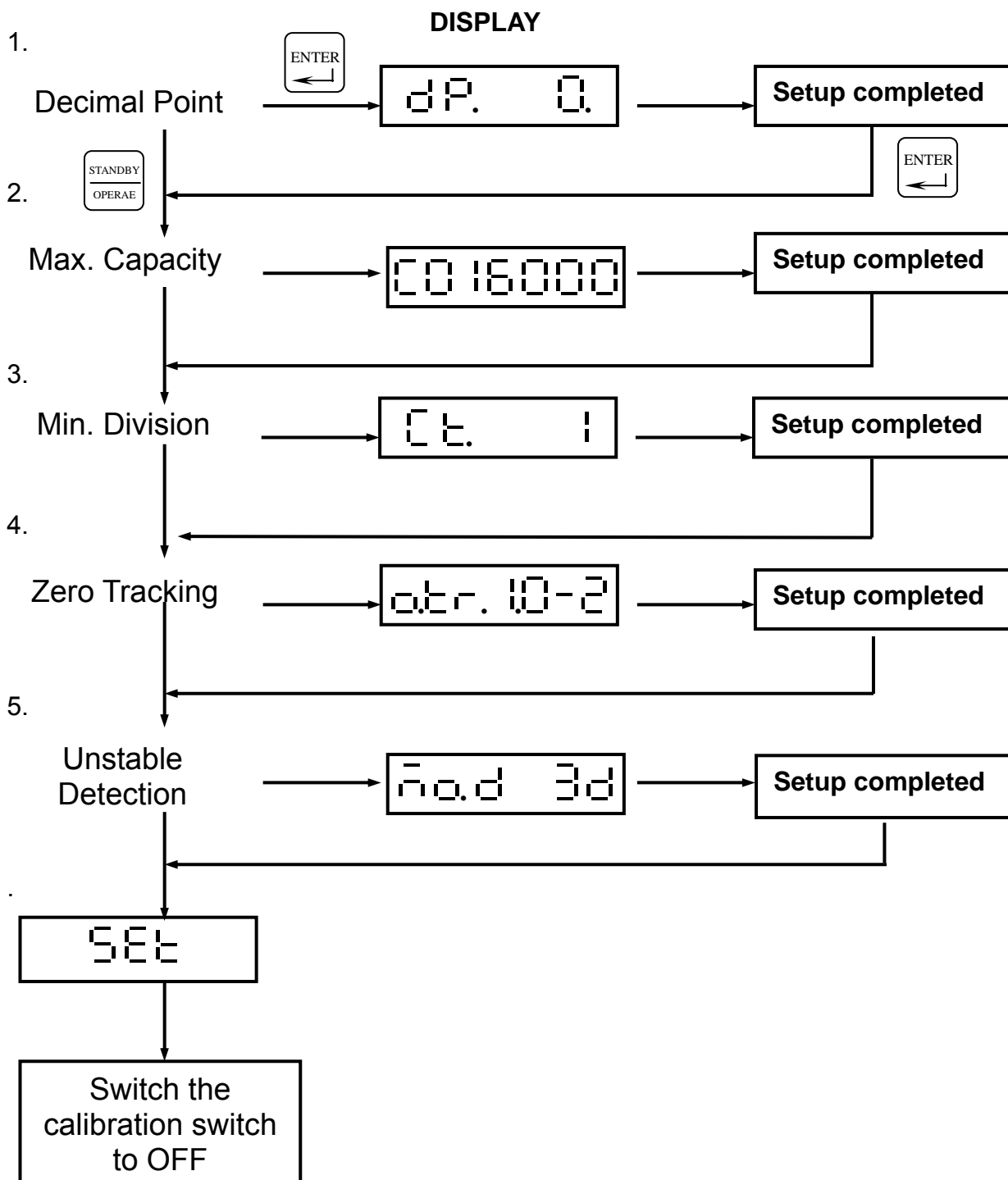
# CHAPTER 5 CAPACITY CALIBRATION

## 5-1 PARAMETER SETTING

Switch the capacity calibration switch to “ON” and the display shows **SEt** .

Press the  key and the display shows **PAR** . then enter the setting mode.

### 5-1-1 Flow Diagram





## 5-1-2 Description

### 1) Zero Tracking

Display	Division / Time
o.tr. 1.0-1	1 d / 1 s
o.tr. 2.0-1	2 d / 1 s
o.tr. 3.0-1	3 d / 1 s
o.tr. 4.0-1	4 d / 1 s
o.tr. 1.0-2	1 d / 2 s
o.tr. 2.0-2	2 d / 2 s
o.tr. 3.0-2	3 d / 2 s
o.tr. 4.0-2	4 d / 2 s
o.tr. no	No zero tracking

### 2) Unstable Detection

Display	Division / Time
n̄o.d 1d	1 d / s
n̄o.d 2d	2 d / s
n̄o.d 3d	3 d / s
n̄o.d 4d	4 d / s
n̄o.d 5d	5 d / s
n̄o.d no	No detection





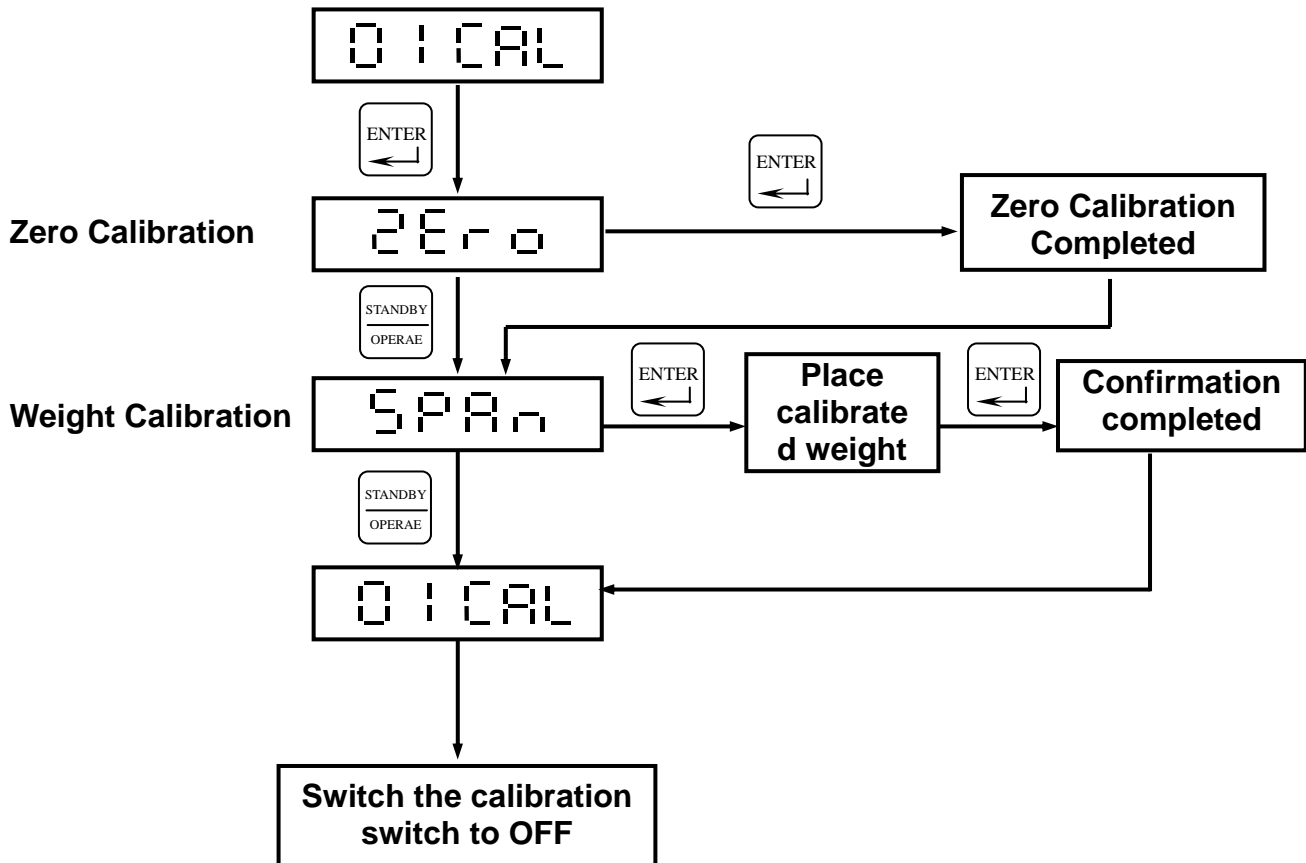
## 5-2 CALIBRATION SETTING

Please allow the indicator to warm up at least 15 to 30 minutes before calibration.

Switch the capacity calibration switch to “ON” and the display shows **SEL**.

Press the **CAL** key and the display shows **00 CAL** . then enter the setting mode.

### 5-2-1 Calibration Procedure



### 5-2-2 Zero Calibration

a) Make sure that there are no objects on the weighing platform and press the **ENTER** key, after the indicator has stabilized the display will show “ ..... ”. The calibration is completed after about 5 seconds.

b) To skip the “Zero calibration” procedure, press the **STANDBY/OPERAE** key.

### 5-2-3 Weight Calibration

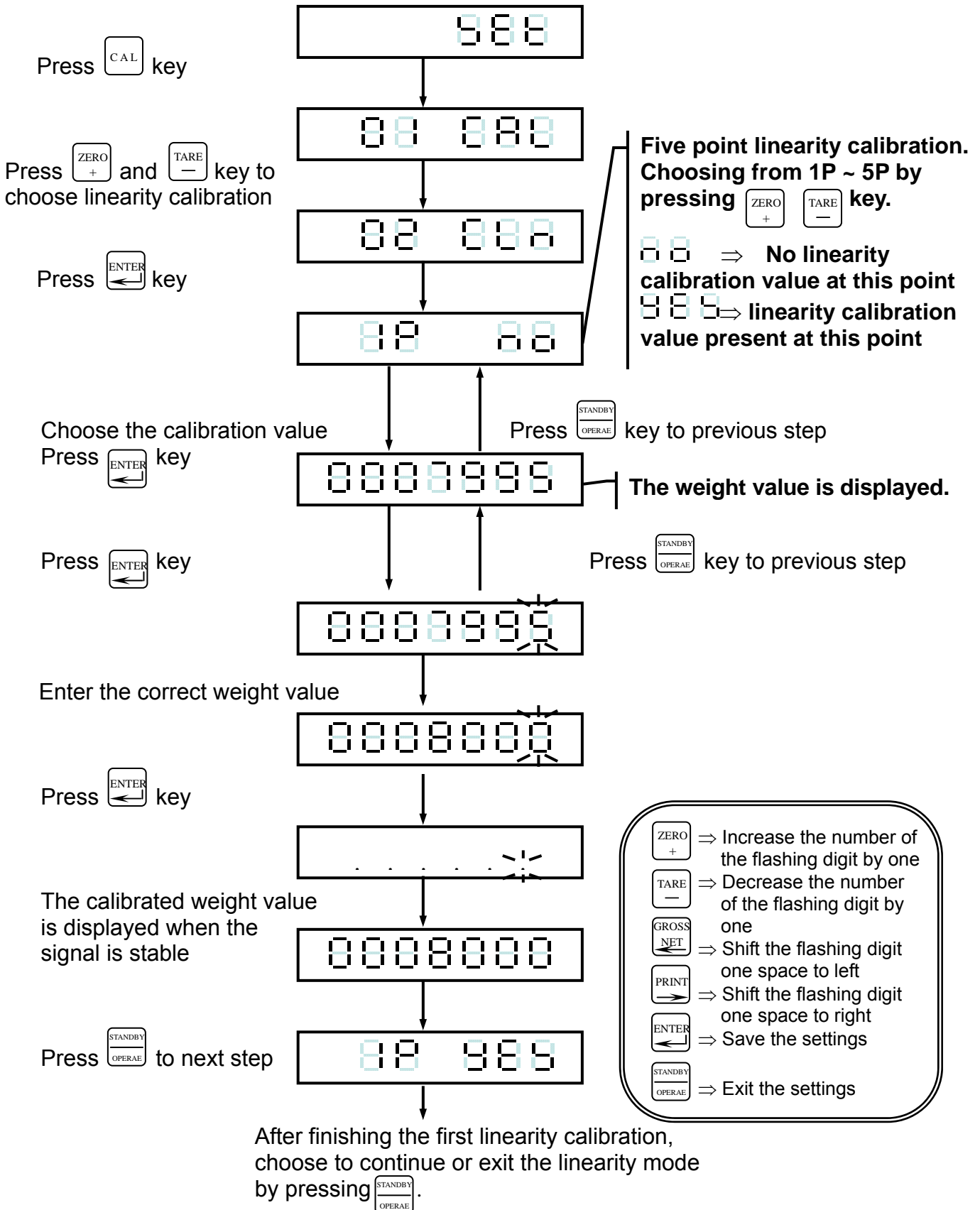
a) Place an accurate weight onto the platform; use the front panel keys to key in the weight value. Press the **ENTER** key, after the indicator is stabilized the display will show “ ..... ”. The calibration is completed after about 5 seconds.

b) To skip the weight calibration, press the **STANDBY/OPERAE** key.



### 5-3 LINEARITY CALIBRATION

Before linearity calibration, make sure "Zero calibration" and "Weight Calibration" are properly performed. Set the calibration switch to ON position.

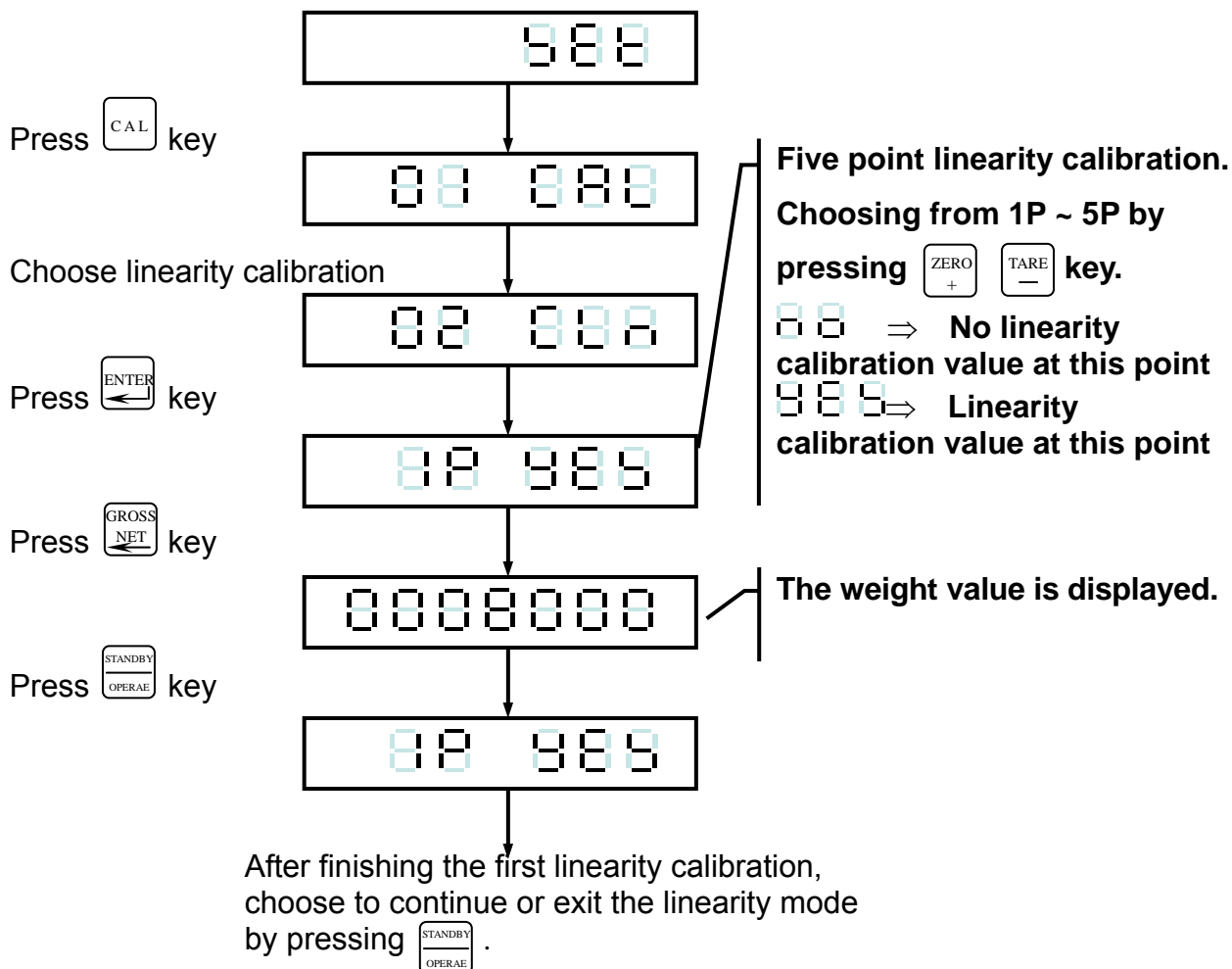


◆ Refer to 5-4 Error Messages when any error message appears during the procedure.



### Recall Linearity correction point

Set the calibration switch to ON position.

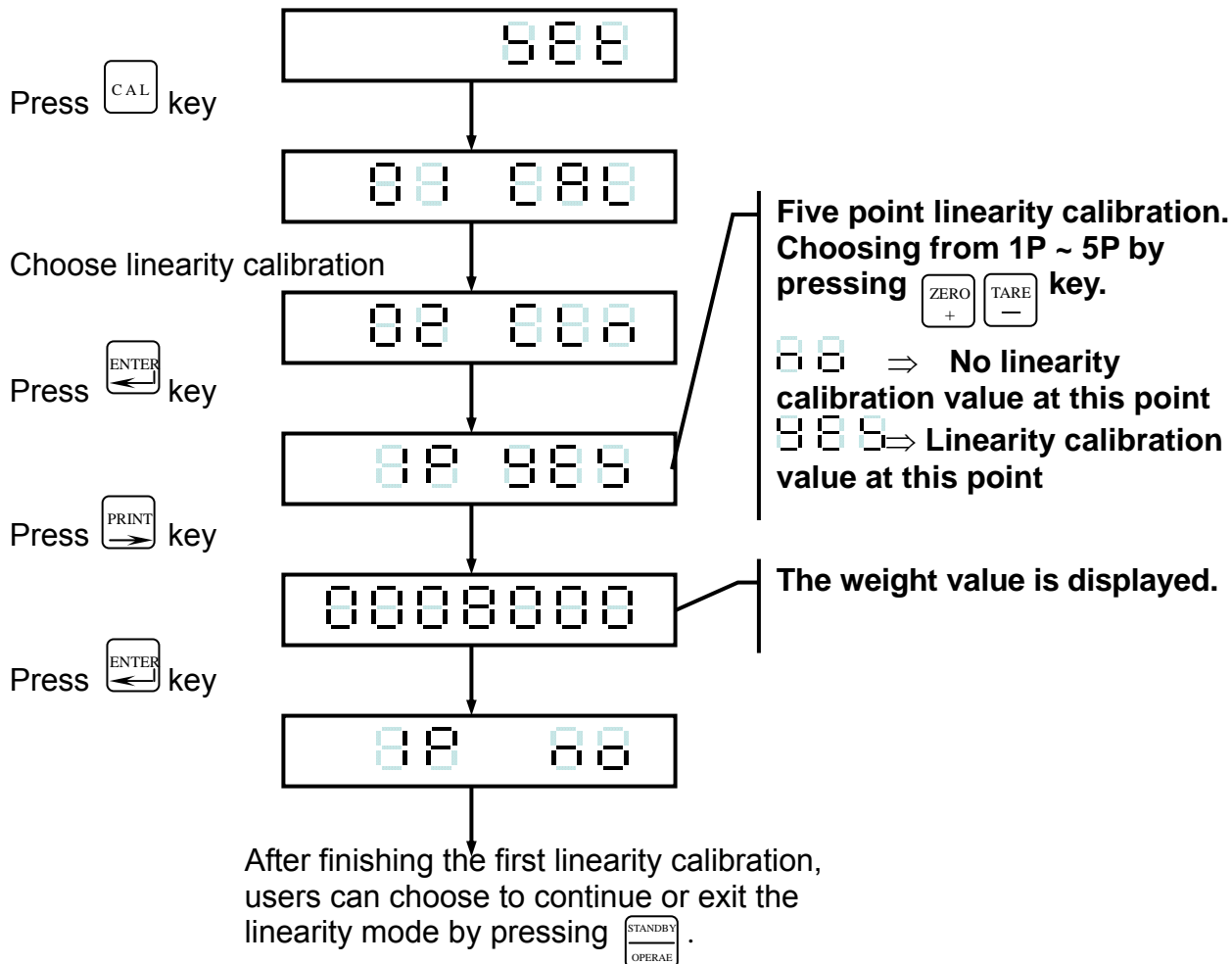


- ⇒ Increase the number of the flashing digit by one
- ⇒ Decrease the number of the flashing digit by one
- ⇒ Shift the flashing digit one space to left
- ⇒ Shift the flashing digit one space to right
- ⇒ Save the settings
- ⇒ Exit the settings



### Clear a linearity correction point

Set the calibration switch to ON position.

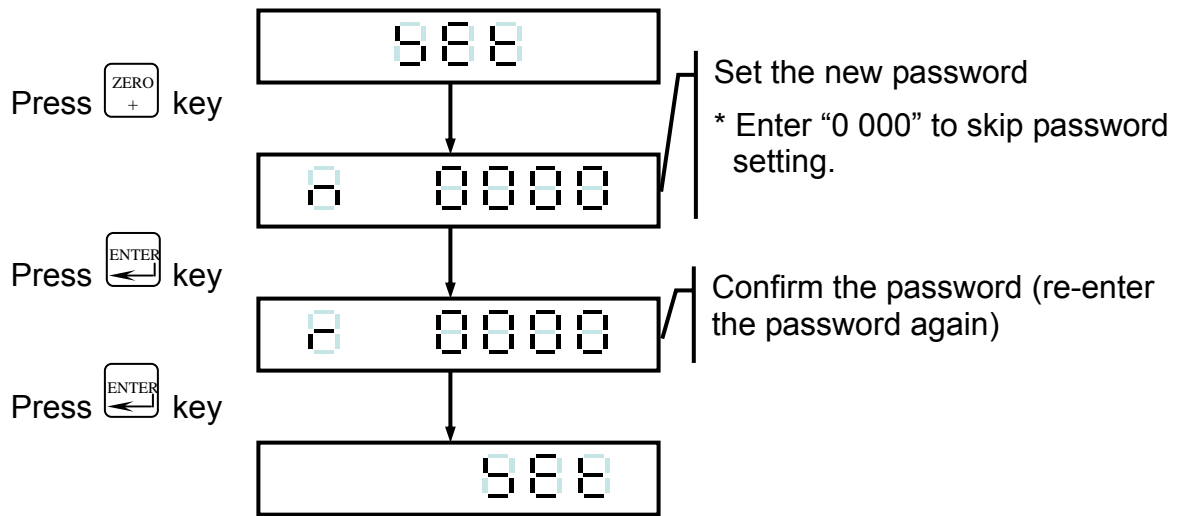


	⇒ Increase the number of the flashing digit by one
	⇒ Decrease the number of the flashing digit by one
	⇒ Shift the flashing digit one space to left
	⇒ Shift the flashing digit one space to right
	⇒ Save the settings
	⇒ Exit the settings



## 5-4 PASSWORD SETTING

Set the calibration switch to ON position.



	⇒ Increase the number of the flashing digit by one
	⇒ Decrease the number of the flashing digit by one
	⇒ Shift the flashing digit one space to left
	⇒ Shift the flashing digit one space to right
	⇒ Save the settings
	⇒ Exit the settings

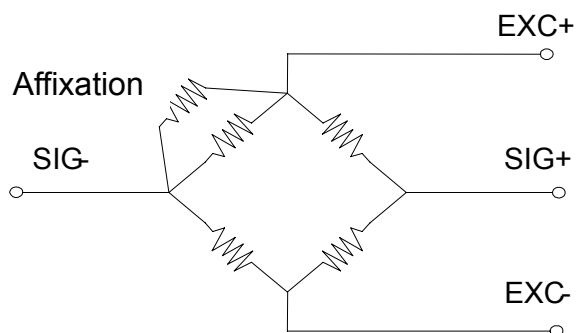
Once the password is set, whenever users access to the calibration mode or the other function settings, the display shows After 1 sec. , and users need to enter the password. If the password is incorrect, is displayed.

Please contact your supplier if forgetting the password.



## 5-5 ERROR MESSAGES

- (1) Err 0 The load cell and A/D are abnormal.
- (2) Err 1 The most capacity setting value is over the high limited value.
- (3) Err 2 When zero calibration, load cell inputs too much. If the load cell is not shattered, please connect a precision resistance (50 kΩ ~ 500 kΩ)




- (4) Err 6 Calibration resolution is less 0.3μV / d.
- (5) Err 7 The actual weight value is less than zero value.
- (6) Err 8 The load cell output voltage is over measurable range 20 mV.
- (7) Err . Incorrect password.



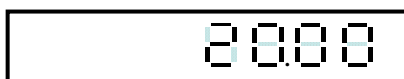
## CHAPTER 6 ANIMAL SCALE FUNCTION SETTING


### ☐ FUNC. 8 = 1 (Animal scale function is active)

“” is displayed, when there is no object on the weight panel:



The weight of live stocks is measured and showed in the display, (20 kg in this example):



The weight value will be held until removing all the objects on the weight panel. When the weight value is below zero band and display shows “”, the scale is ready for another weighing operation.



### ☐ Zero band

The setting is not “0”.



# CHAPTER 7 INTERFACES

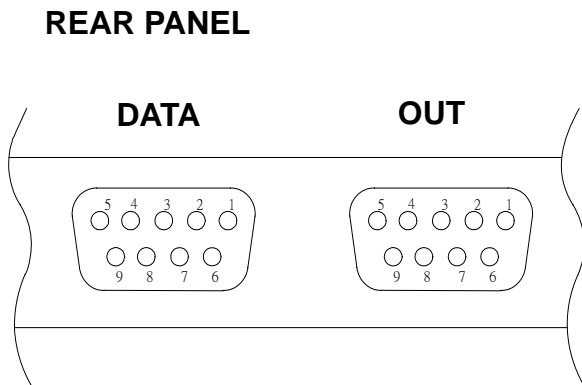
## 7-1 OP-01 RS-422 & RS-485 INTERFACE

### ☐ OP-01 RS-422 / RS-485

With this interface up to 10 indicators can be connected together and data transferred to a host controller.

**FUNC. 70 should be set to “ 1 ”**

### ☐ Connector pin assignment



Pin number	Function
1	T+ / DA
2	T - / DB
3	R+
4	R -
5	TRM
6	FG
7	
8	
9	RDB'

### ☐ Remark:

- ◆ The host computer has a built-in terminator. The host computer does not have signal ground (SG).
- ◆ When RS-422 is transferred to RS-485, Pin1, 3 (short) and Pin 2, 4 (open).
- ◆ When connecting the last EX-2001 indicator, the fifth Pin (TRM) and the ninth Pin (RDB') should be connected together.





# WIRING NOTICE

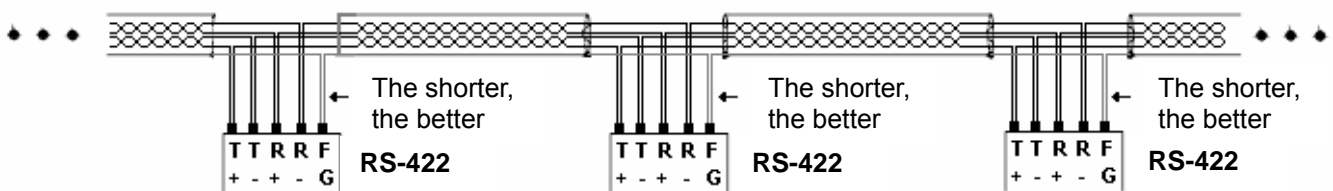
## Transmission wire

Twisted pair is a must. The quality of the transmission has great effect on the transmission signal. Twisted pair with low quality (e.g. PVC wire) gives a really weak signal when the transmission rate is high. The distance of transmission decreases largely and anti-noise ability become worse. Suggest using twisted pair in polyethylene (e.g. Belden 9841) in circumstances of high transmission rate, long distance and high noises.

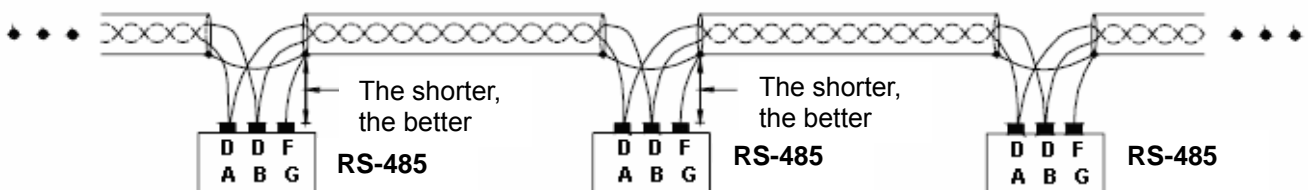
## Connection method

Connection method of RS-422 and RS-485 are as follow: The transmission wire should be from the first station to the second station, from the second station to the third station.....until the last station.

### RS-422 BUS CONNECTING

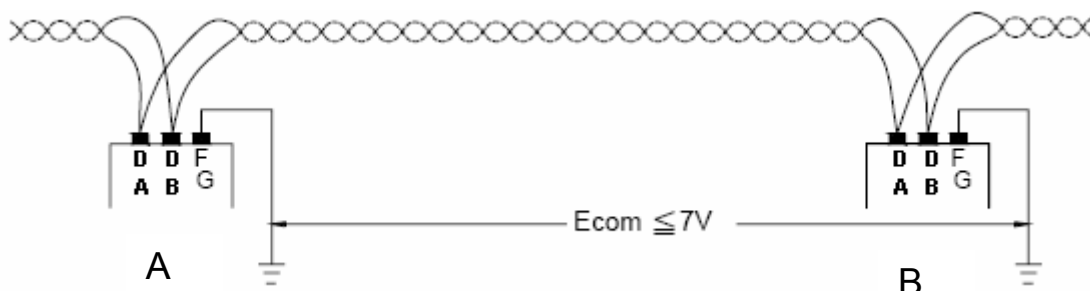


### RS-485 BUS CONNECTING



## FG Grounding

Though RS-485 has two wires to connect, it is easy to be disturbed by yawp. The potential difference among any station does not exceed 7 V (IC permitted), or RS-485 does not work. In use, whatever the ground potential is, we suggest using the twisted pair. FG connected to the ground wire to clear the potential. Supply the shortest loop of the transmission signal to improve the anti-noises.





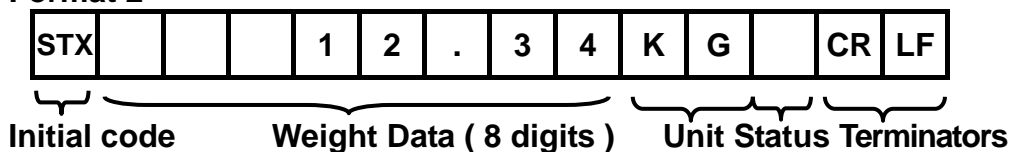
☐ Refer to Chapter 9 Function Table to set FUNC. 60 ~ FUNC. 69

☐ Transmit format

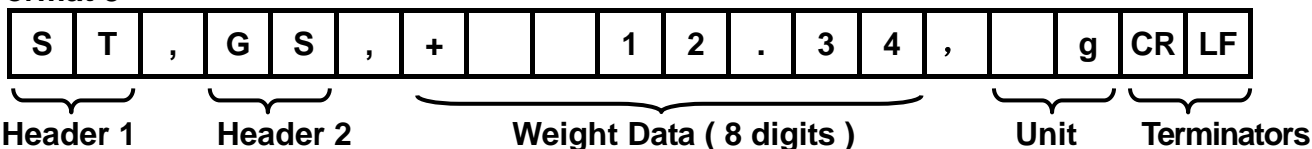
Format 1



Format 2



Format 3



Format 4



#### Header 1

ST : Stable / US : Unstable / OL : Over Load

#### Header 2

GS : Gross weight / NT : Net weight / TR : Tare

#### Weight Data ( 8 digits )

Format 1

The first digit is the “+ / -” symbol for weight value. The next seven digits include decimal point and weight value. When the weight is over loaded (Header 1 : OL), all digits will be transmitted “blank” (sp) except the “+ / -” signal and the decimal point.

Format 2

The first digit is the “+ / -” symbol for weight value. “+” symbol will display “blank”. The next seven digits include decimal point and weight value. When the value is inefficacy, all digits will be transmitted “blank”.

Format 3 ~ 4

The first digit is the “+ / -” symbol for weight value. The next seven digits include decimal point and weight value. When the value is inefficacy, all digits will be transmitted “blank”.



### Status

Stable: display “blank”    Unstable: display “M”    Over load: display “O”

### Units

Kg, g, t, lb or “blank”

### Terminators

CR, LF is the data finish code.



### Command mode

COMMAND	FUNCTION
READ, RW	Reads weight
ZERO, MZ	Back to zero
TARE, MT	Tare
NTGS	Switches gross / net weight
MG	Displays gross weight
MN	Displays net weight
CT	Clears tare

- ❶ The command string must be terminated with CR ( 0DH ) , LF ( 0AH ) .
- ❷ If a wrong command is received, the indicator will reply “E” + “ error command ” .
- ❸ If the command mode has been selected “with address”, (FUNC. 61 = 4) then every command must be preceded with an indicator address in the format:- “ @ address ”

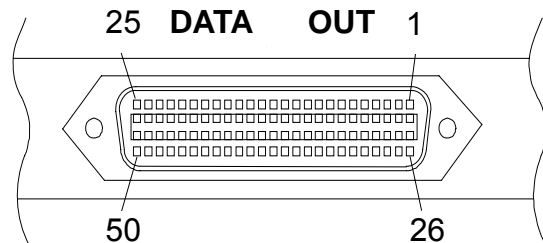
Example: To read the weight value form indicator addressed as 01 (“01” selected in FUNC. 67) The complete command is **@01RW<CR><LF>**



## 7-2 OP-02 PARALLEL BCD OUTPUT

### Pin assignment

#### REAR PANEL



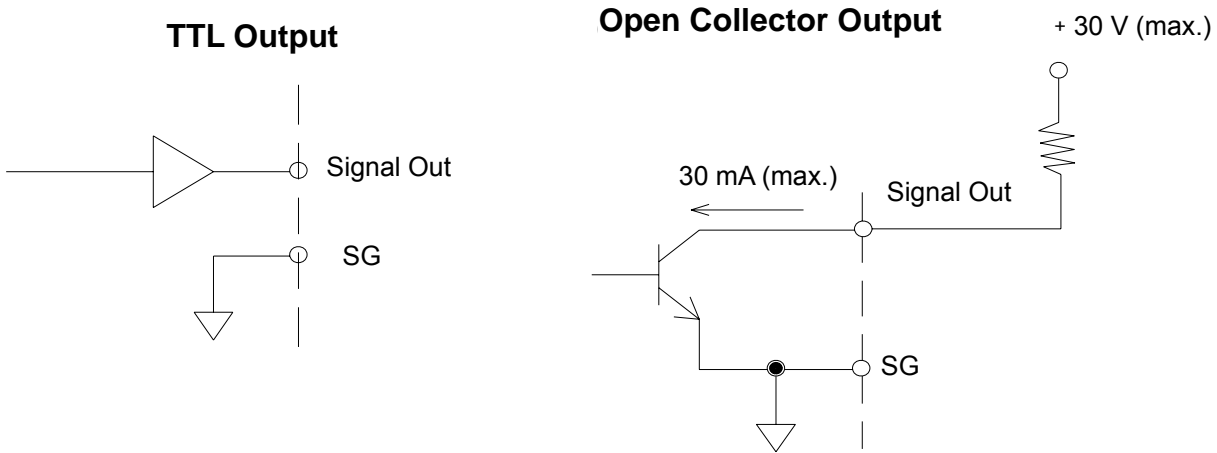
BCD parallel output interface  
uses Centronic 50 PIN connector

Pin number	Function	Pin number	Function
1	SG	26	SG
2	$1 \times 10^0$	27	Gross/-NET
3	$2 \times 10^0$	28	
4	$4 \times 10^0$	29	
5	$8 \times 10^0$	30	
6	$1 \times 10^1$	31	
7	$2 \times 10^1$	32	
8	$4 \times 10^1$	33	Stable
9	$8 \times 10^1$	34	
10	$1 \times 10^2$	35	
11	$2 \times 10^2$	36	
12	$4 \times 10^2$	37	
13	$8 \times 10^2$	38	
14	$1 \times 10^3$	39	
15	$2 \times 10^3$	40	
16	$4 \times 10^3$	41	
17	$8 \times 10^3$	42	PO SITIVE
18	$1 \times 10^4$	43	DP10 <sup>1</sup>
19	$2 \times 10^4$	44	DP10 <sup>2</sup>
20	$4 \times 10^4$	45	DP10 <sup>3</sup>
21	$8 \times 10^4$	46	DP10 <sup>4</sup>
22	$1 \times 10^5$	47	OVER
23	$2 \times 10^5$	48	
24	$4 \times 10^5$	49	Data ready
25	$8 \times 10^5$	50	Hold input



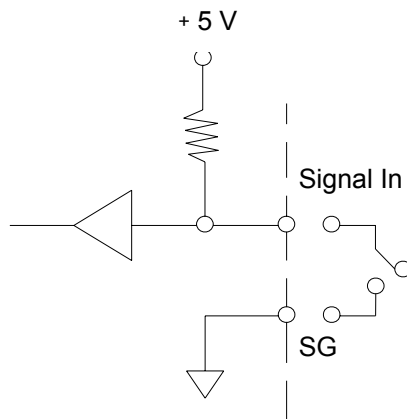
Refer to Chapter 9 Function Table to set FUNC. 80 ~ FUNC. 83

Output equivalent circuit



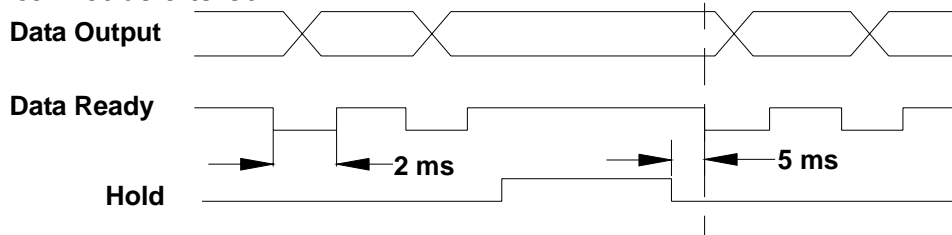
Hold Input

Hold Input



Output / Input signal description

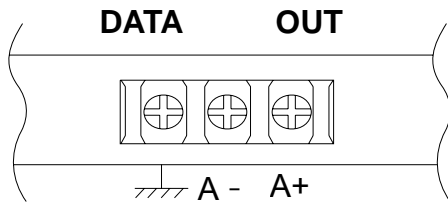
- ❶ A total of 33 bit outputs are provided. To set the output logic level, refer to Chapter 9 FUNC 82 and FUNC 83.
- ❷ If Open Collector output is selected, an external resistor is required to limit the current in the interface. The voltage should not exceed 30Vdc and current should be less than 30 mA.
- ❸ “Hold input” is the only one input signal. To activate the “Hold input”, just connect the Hold input to SG signal. When Hold is working, all BCD outputs will be held and cannot be altered.





## 7-3 OP-03 ANALOGUE CURRENT / VOLTAGE OUTPUT INTERFACE

### ☐ Connections



### Interface specification

Analogue current output : 0 ~ 20 mA

Load resistor : 0 ~ 550  $\Omega$

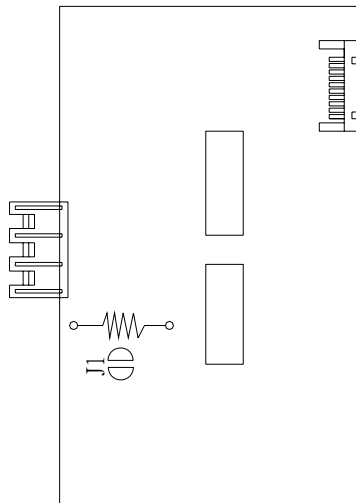
Resolution : 16 bit

### ☐ Refer to Chapter 9 Functions Table to set FUNC 85 ~ FUNC 89

### ☐ Voltage output

J1 short if the voltage output is 0 ~ 10 V.

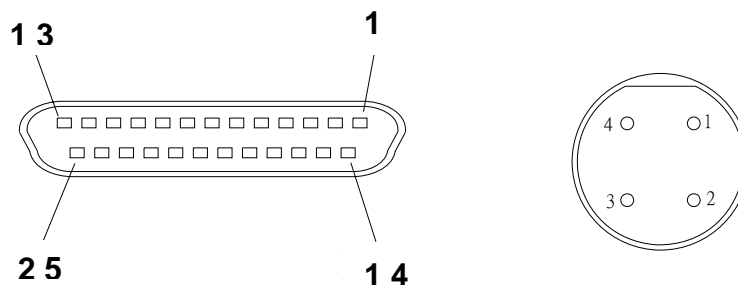
J1 open if the current output is 4 ~ 20 mA.





## 7-4 OP-05 PARALLEL PRINTER OUTPUT & RS-232 & CURRENT LOOP

☐ Pin assignment



Pin number	Function	Pin number	Function
1	$\overline{\text{STROBE}}$	14	NC
2	D0	15	$\overline{\text{ERROR}}$
3	D1	16	$\overline{\text{INIT}}$
4	D2	17	NC
5	D3	18	SG
6	D4	19	SG
7	D5	20	SG
8	D6	21	SG
9	D7	22	SG
10	$\overline{\text{ACK}}$	23	SG
11	BUSY	24	SG
12	NC	25	SG
13	NC		

☐ Refer to Chapter 9 Functions Table to set FUNC 90 ~ FUNC 99



## ☐ RS-232 Pin position

Pin number	Function	Pin number	Function
1	TXD	3	C. LOOP1
2	SG	4	C. LOOP2

☐ Refer to Chapter 9 Functions Table to set FUNC 60 ~ FUNC 69

☐ The function is only to transmit but not to receive.

☐ Print Format

**Format 1 ( FUNC. 90=0 )**

FUNC. 95 ≠ 0 ⇒ Print "SN" value

**DATE** : 2001/08/30  
**TIME** : 12:13:36  
**SN.** : 1  
**GROSS** : 11.5 kg  
**TARE** : 1.5 kg  
**NET** : 10.0 kg

FUNC. 95 = 0 ⇒ No "SN" value

**DATE** : 2001/08/30  
**TIME** : 12:13:36  
**GROSS** : 11.5 kg  
**TARE** : 1.5 kg  
**NET** : 10.0 kg

**Format 2 ( FUNC. 90=1 )**

Material : 0

DATE : 2001/08/30

SN.	TIME	NET (kg)
1	12:14:39	11.5
2	12:14:45	6.5

## SUB TOTAL

DATE : 2001/08/30

COUNT : 2

NET : 18.0 kg

3	12:14:57	8.0
---	----------	-----

## SUB TOTAL

DATE : 2001/08/30

COUNT : 1

NET : 8.0 kg

## GRAND TOTAL

DATE : 2001/08/30

COUNT : 3

NET : 26.0 kg



**Format 3 ( FUNC. 90=2 )**

SN.	DATE	TIME	GROSS (kg)	TARE (kg)	NET (kg)
1	2001/08/30	12:16:19	7.0	2.0	5.0
2	2001/08/30	12:16:31	7.0	2.0	5.0
<b>SUB TOTAL</b>					<b>10.0</b>
3	2001/08/30	12:17:00	12.0	7.0	5.0
4	2001/08/30	12:17:19	12.0	7.0	5.0
<b>GRAND TOTAL</b>					<b>20.0</b>

**Format 4 ( FUNC. 90=3 )****EZ-2 print format**

FUNC. 95 ≠ 0 ⇒ Print "SN" value

FUNC. 95 = 0 ⇒ No "SN" value

2001/11/26	08:53:05
SN. :	1
GROSS :	5.00
TARE :	0.00
NET :	5.00

2001/11/26	08:53:05
GROSS :	5.00
TARE :	0.00
NET :	5.00

25 mm  
Label Width2 mm  
Label Space

2001/11/26	08:52:05
SN. :	1
GROSS :	5.00
TARE :	0.00
NET :	5.00

2001/11/26	08:52:05
GROSS :	5.00
TARE :	0.00
NET :	5.00

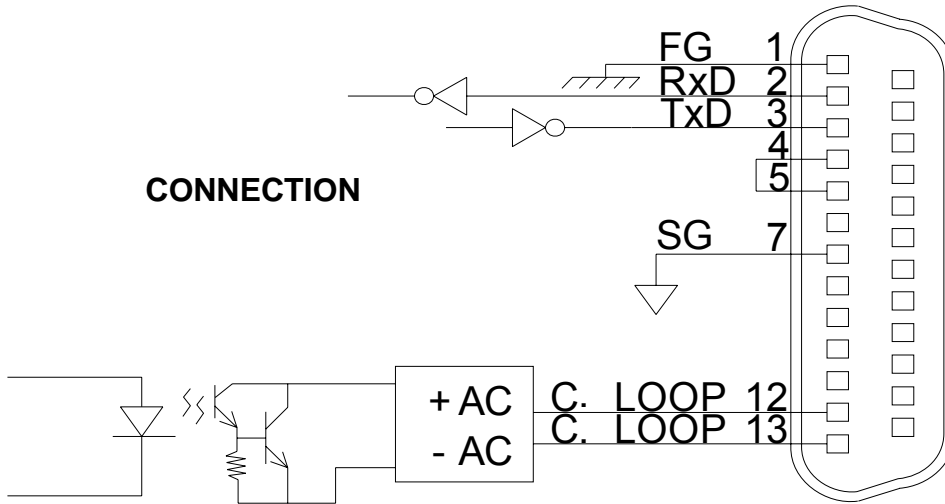
25 mm  
Label Width



## 7-5 OP-06 RS-232 & CURRENT LOOP

### ☐ RS-232 / CURRENT LOOP

RS-232C is a bi-directional output/input; CURRENT LOOP is one-way output only, and the output data format is the same as RS-232.



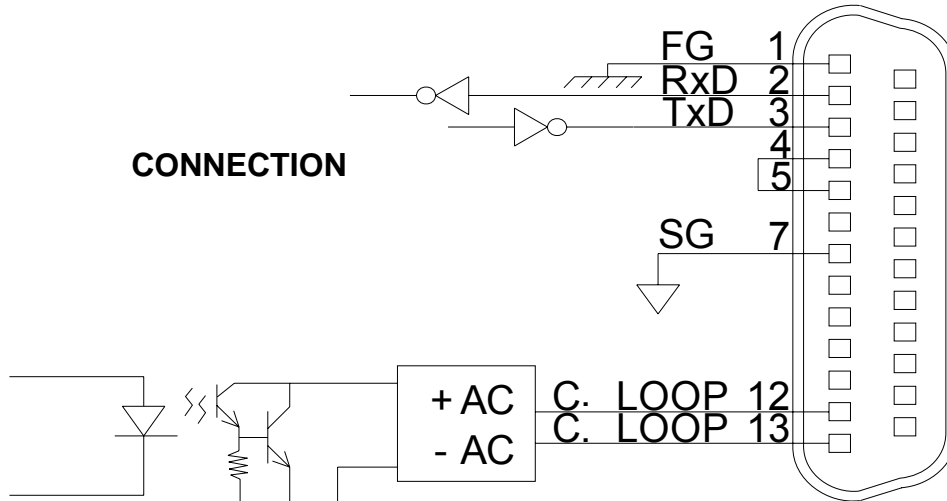
☐ Refer to Chapter 9 Functions Table to set FUNC 60 ~ FUNC 69



## 7-6 OP-07 RS-232, CURRENT LOOP & DATA CLOCK OUTPUT

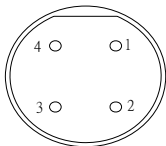
### RS-232 / CURRENT LOOP

RS-232C is a bi-directional output/input; CURRENT LOOP is one-way output only, and the output data format is the same as RS-232.



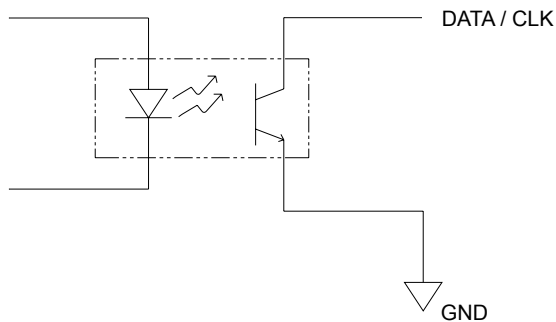
### Data Clock serial output

FUNC. 70 should be " 0 "



Pin Position	Function
1	+ 5V
2	DATA
3	CLK
4	GND

### Inner Connection



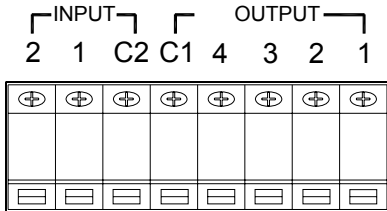
Refer to Chapter 9 Functions Table to set FUNC 60 ~ FUNC 69



# 7-7 OP-08 CONTROL I/O (2I /4O) INTERFACE

## External input and relay output

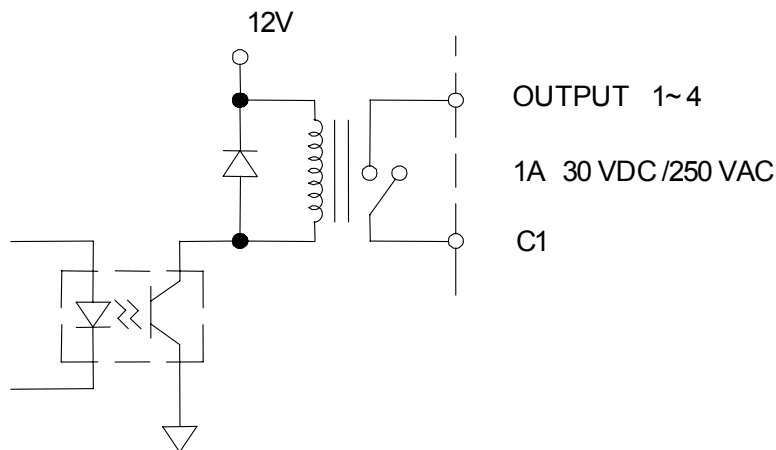
### CONTROL IN / OUTPUT



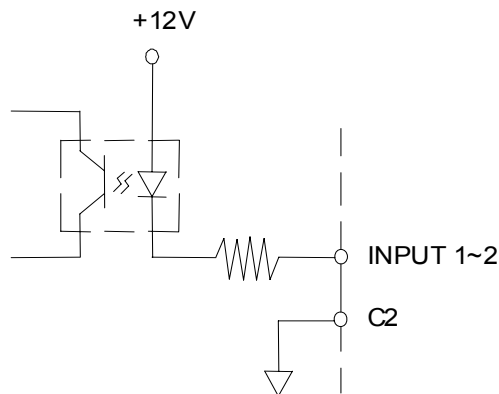
### Output Pin Function

- 1 : Zero Band
- 2 : HI
- 3 : OK
- 4 : LO

### Input / output connectors on the rear panel



### The output circuit of Relay

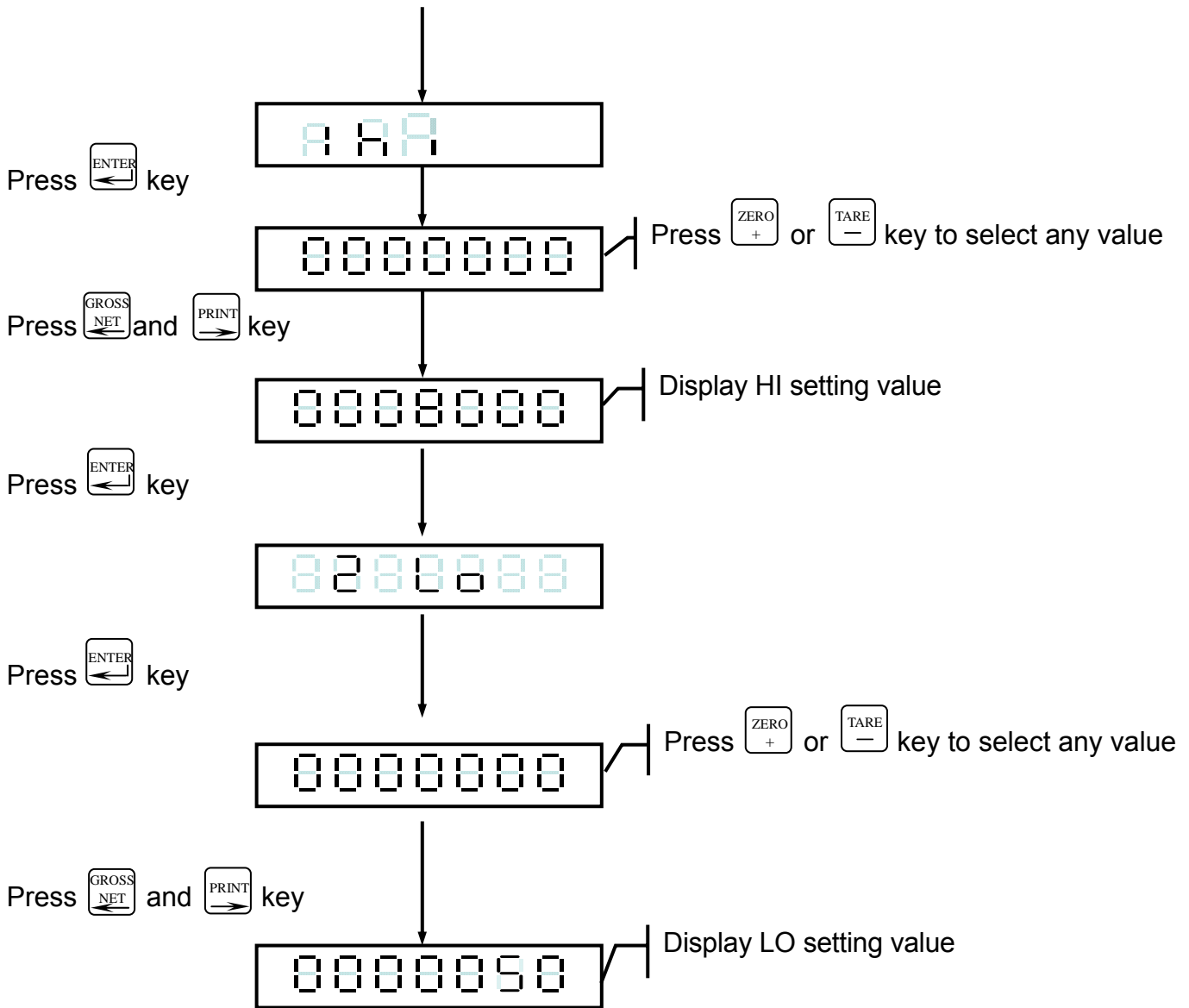


### The input circuit



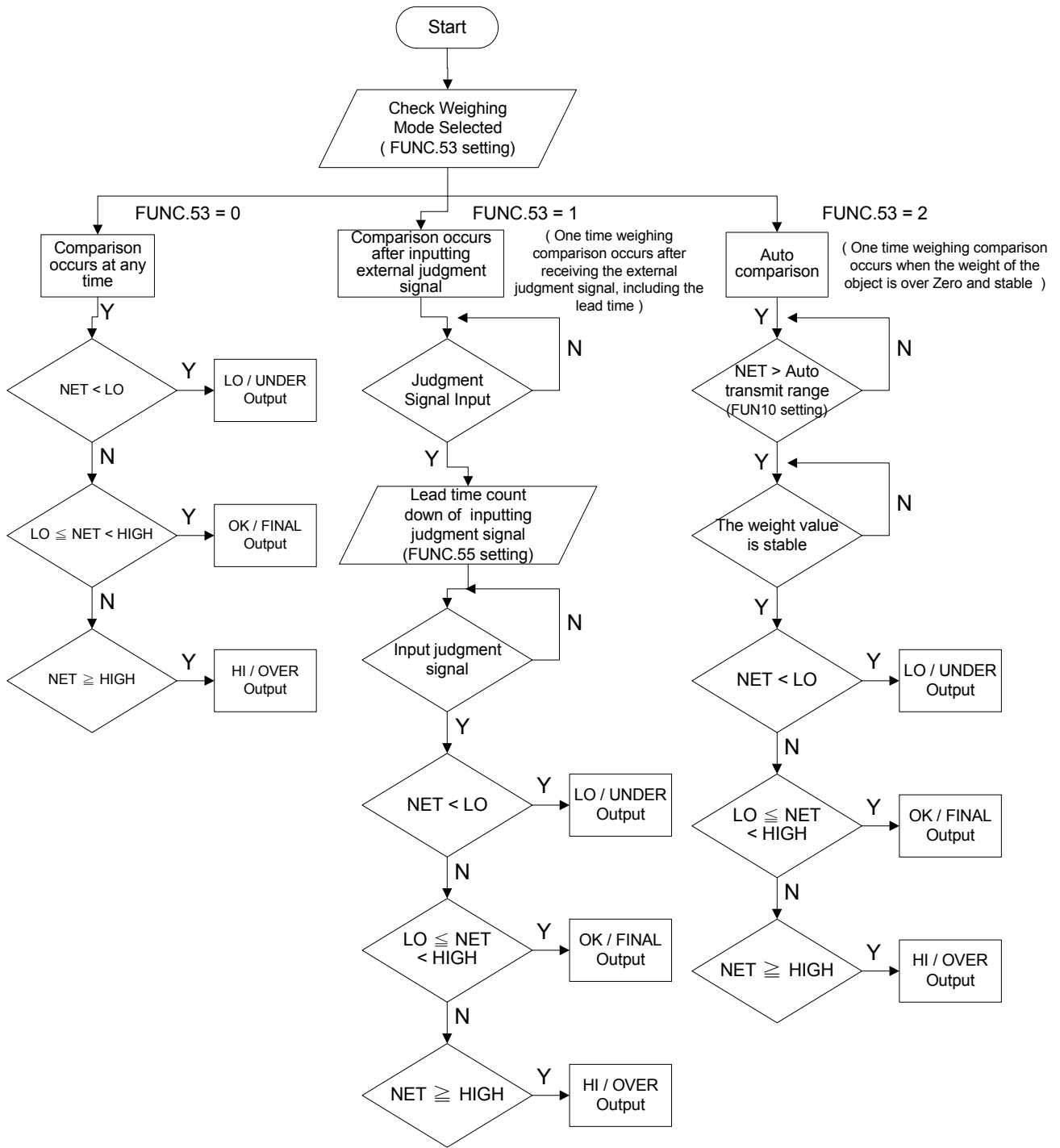
## The Flow Chart of HI , OK , LO Setting

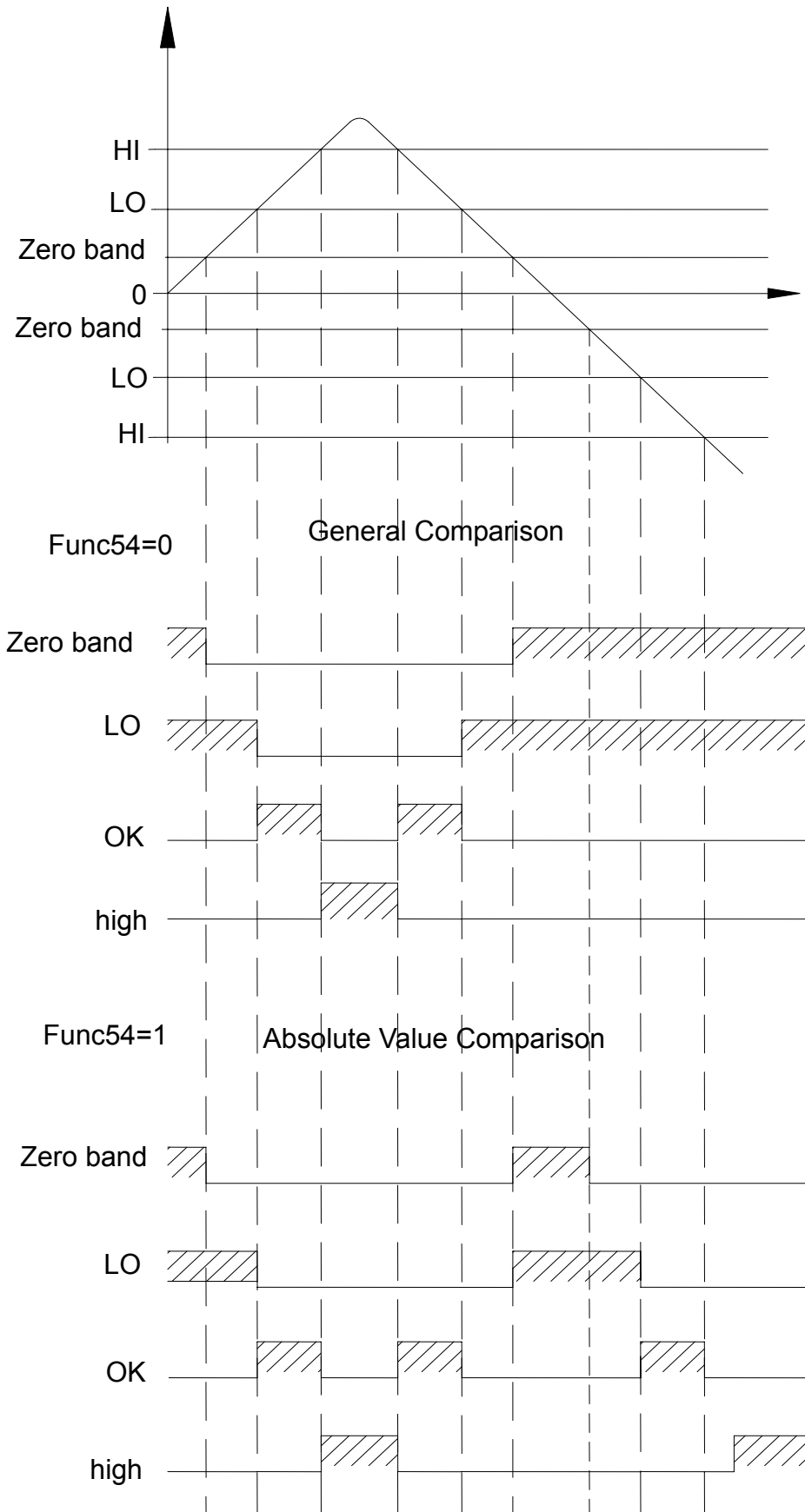
Press and hold , followed by pressing , to enter the check weighing mode.





# HI , OK , LO Output Procedure













# CHAPTER 8 MAINTENANCE







## 8-1 RESET ALL PARAMETERS BACK TO DEFAULT

- (1) Switch the capacity calibration switch to “ON”, press and hold   keys together when the indicator is in the self-testing sequence.
- (2) The display shows **INITIAL**.
- (3) Press and hold the  key until the display shows **END**. Switch the calibration switch to “OFF”.

## 8-2 RESET GENERAL FUNCTION PARAMETERS BACK TO DEFAULT

- (1) When the indicator reset back to zero, press and hold   keys. The indicator is in the self-testing sequence.
- (2) The display shows **INIT.Fn**.
- (3) Press and hold the  key until the indicator resets.

## 8-3 SELF-DIAGNOSIS MODE

- (1) When the indicator reset back to zero, press and hold   keys. The indicator is in the self-testing sequence.
- (2) When the display shows **DISP**, it means the indicator is already in the Self-diagnosis mode.
- (3) Press  and  keys to select a diagnosis item. Press the  key to enter the selected item for diagnosis and press  to exit.





No.	Display	Diagnosis Item
1	d s p	7 digits display and LED status lights
2	EEY	Keyboard and calibration ON / OFF switch
3	232	OP-06 RS-232 serial output / input interface
4	bcd	OP-02 BCD parallel output interface
5	AnL	OP-03 Analogue current output interface
6	Pnt	OP-05 Parallel printer interface
7	EEP	EEPROM memory on main board
8	Elle - io	OP-08 Control I/O interface

### 8-3-1 7 Digit Display and LED Status Light Diagnosis

7 digit display shows 0 ~ 9 , "." And at the same time, the LED status lights turn on and off in order.

### 8-3-2 Keyboard and Calibration ON / OFF Switch Diagnosis

Switch the calibration switch to "ON", or press any keys and the corresponding digit goes from 1 → 1 on the display.

### 8-3-3 RS-232 Serial Output / Input Interface Diagnosis ( OP-06 / OP-07 )

(1) Short circuit the 2<sup>nd</sup> pin and 3<sup>rd</sup> pin of the SER. OUT. D-SUB 25 pin connector.

PASS = Working properly      FAIL = Malfunction

(2) If connecting to a computer (The communication protocol has to be compatible),

if 0 ~ 9 can be read, it indicates that the RS-232 is in working order.

### 8-3-4 BCD Parallel Output Interface Diagnosis ( OP-02 )

(1) The decimal point flashes during the diagnosis.

(2) The program sends out OFF→ON→OFF signals from each of BCD output bit.

(3) If no - IF is displayed, this indicates that no BCD interface is installed.



### 8-3-5 Analogue Current Output Interface Diagnosis ( OP-03 )

(1) Use  and  keys to select output current.

(a) **ANL 4** : 4 mA

(b) **ANL 12** : 12 mA

(c) **ANL 20** : 20 mA

(2) If **no - IF** is displayed, this indicates that an interface has not been installed.

### 8-3-6 Parallel Printer Interface Diagnosis ( OP-05 )

(1) Connect the interface to the printer.

(2) Press the  key and the printer will print date, time and ASCII code as 30H ~ 7AH characters or figures.

(3) If **Err** is displayed, this indicates that the printer or the interface is not working properly.

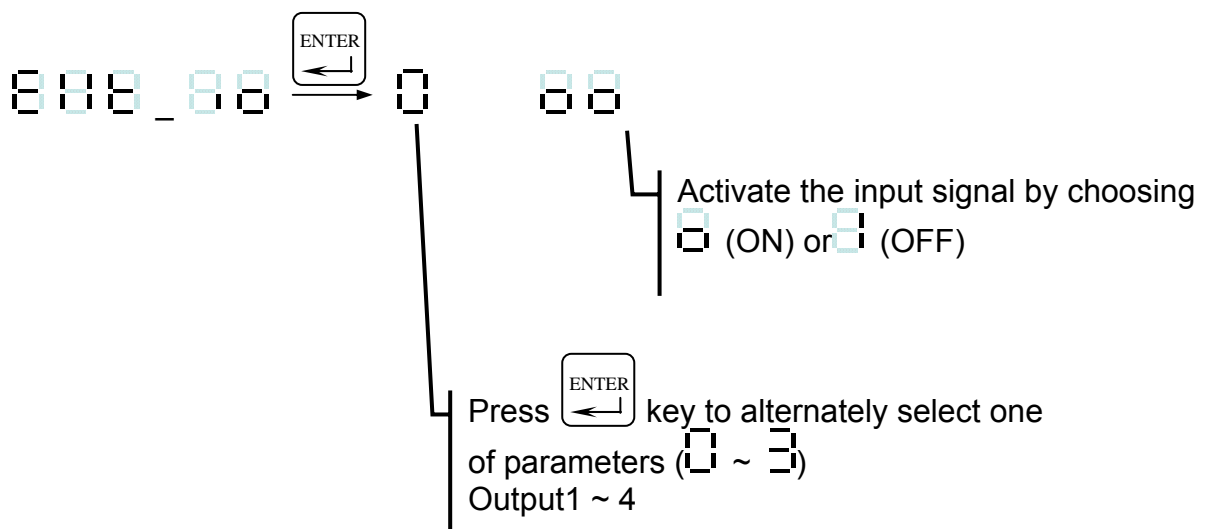
(4) If **no - IF** is displayed, the interface is not connected to the indicator.

### 8-3-7 Main Board EEPROM Memory Diagnosis

**PASS** = Working properly

**FAIL** = Malfunction





### 8-3-8 OP-08 Control I/O (2I/4O) Diagnosis





# CHAPTER 9 FUNCTION TABLE

## GENERAL FUNCTION

FUNC.NO	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 0	Tare and Zero function when the weight is unstable	0	ON	0
		1	OFF	
FUNC. 1	Tare function with negative gross weight	0	ON	0
		1	OFF	
FUNC. 2	Key function	0 000 ↓ 1 111	0 ON 1 OFF	0 000
		0 000 corresponding keys from left to right are    		
FUNC. 3	Auto Zero function after power on	0	OFF	0
		1	ON	
FUNC. 4	Zero range	0d ↓ 9d	When the weight is in this range ±(Set value × Min. division) it displays "0"	0
FUNC. 5	Weighing Filter (1)	0	5 Hz	4
		1	4.17 Hz	
		2	2.5 Hz	
		3	2.08 Hz	
		4	1.25 Hz	
		5	1.04 Hz	
		6	0.63 Hz	
		7	0.52 Hz	
		8	0.31 Hz	
		9	0.26 Hz	
FUNC. 6	Weighing Filter (2)	0	Not use	2
		1~5	weak → strong	




FUNC.NO	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 7	A/D sampling frequency	0	Unlimited	1
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 time/2s	
FUNC. 8	Animal scale	0	OFF	0
		1	ON	
FUNC. 9	Animal scale sampling frequency	0	Unlimited	0
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	

### OP-08 Control I / O ( 2I / 4O ) INTERFACE FUNCTION


FUNC. NO.	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 50	Input 1	0 ⇒ No capacity 1 ⇒ Zero		1
FUNC. 51	Input 2	2 ⇒ Tare 3 ⇒ Clear Tare 4 ⇒ Judgment_comm_flag		2
FUNC. 52	Output logic	0 000	Positive logic	0 000
		1 111	Negative logic	
FUNC. 53	HI, OK, LO Check weighing mode	0	Comparison occurs at any time	0
		1	Comparison occurs after inputting external judgment signal	
		2	Auto comparison	
FUNC. 54	Comparison mode	0	General comparison +	0
		1	Absolute value only comparison +/-	
FUNC. 55	Lead time setting for activating comparison	0.0 ↓ 25.5	Lead time setting for inputting external judgment signal	0.5



**OP-01 RS-422 / RS-485 , OP-06 / OP-07 RS-232 INTERFACE FUNCTION**

FUNC. NO.	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 60	Data type	0	As displayed	0
		1	Gross	
		2	Net	
		3	Tare	
FUNC. 61	Transmit mode	0	Stream transmit	0
		1	Auto-transmit	
		2	Press the  key to transmit	
		3	Command mode (without address)	
		4	Command mode (with address)	
FUNC. 62	BAUD rate	0	1 200	1
		1	2 400	
		2	4 800	
		3	9 600	
FUNC. 63	Parity bit Data bit Stop bit	0	N, 8, 1	2
		1	O, 7, 1	
		2	E, 7, 1	
FUNC. 64	Units	0	None	1
		1	kg	
		2	g	
		3	t	
		4	lb	
FUNC. 65	Unstable or over the max. capacity	0	Continuous output	0
		1	Stop output	
FUNC. 66	Auto-transmit conditions	0	Positive (more than + 5D)	0
		1	Positive / negative (more than + 5D, less than - 5D)	
FUNC. 67	Command address	00 ↓ 99	When the FUNC. 61 is set in 4, it will use this address	0
FUNC. 68	Output format	0	Format 1	0
		1	Format 2	
		2	Format 3	
		3	Format 4	
FUNC. 69	Transmit frequency	0	Unlimited	4
		1	1 time/s	
		2	2 times/s	
		3	5 times/s	
		4	10 times/s	
		5	20 times/s	
FUNC. 70	Output type	0	Stop RS-422/485	0
		1	Start RS-422/485	

**OP-02 BCD OUTPUT INTERFACE FUNCTION**



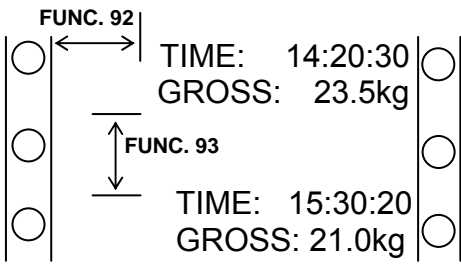
FUNC. NO.	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 80	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC. 81	Transmit mode	0	Stream transmit	0
		1	Auto-transmit	
		2	Press the  key to transmit	
FUNC. 82	Output data logic	0	Positive logic	0
		1	Negative logic	
FUNC. 83	Signal logic	0	Positive logic	0
		1	Negative logic	

**OP-03 ANALOGUE OUTPUT INTERFACE FUNCTION**

FUNC. NO.	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 85	Data type	0	As displayed	0
		1	Gross	
		2	Net	
FUNC. 86	Low point of weight value	000 000 ↓ 999 999	When the weight value reaches the value set in FUNC. 86, the current output is the value set in FUNC. 87	0
FUNC. 87	Low point of output current value	0.0 mA ↓ 20.0 mA		4.0 mA
FUNC. 88	High point Weight value	000 000 ↓ 999 999	When the weight value reaches the value set in FUNC. 88, the current output is the value set in FUNC. 89	16 000
FUNC. 89	High point Output current value	0.0 mA ↓ 20.0 mA		20.0 mA



## OP-05 PARALLEL PRINTER OUTPUT INTERFACE FUNCTION

FUNC. NO.	FUNCTION	SET VALUE		DEFAULT
		PARAMETER	DESCRIPTION	
FUNC. 90	Data format	0 ↓ 3	Select print format	0
FUNC. 91	Transmit mode	0	Press the  to transmit	0
		1	Auto / press  to transmit	
FUNC. 92	The size of left hand side margin	0 ~ 80 (characters)		0
FUNC. 93	The space between blocks of data	0 ~ 80 ( LF )		5
FUNC. 94	Material number	000 000 ↓ 999 999	When printing the material number, it keeps the same value as previously set.	0
FUNC. 95	Serial number	00 000 ↓ 65 535	When printing the serial number, it automatically increments. It resets to 00 000 after restarting the indicator or after printing out the total weight.	1
FUNC. 96	Units	0	None	1
		1	kg	
		2	g	
		3	t	
		4	lb	
FUNC. 98	Date setting	2 000 yr. ↓ 2 099 yr.	Year . Mon . Day Ex: 04 . 02 . 01	
FUNC. 99	Time setting	00:00:00 ↓ 23:59:59	Hour . Min . Sec Ex: 23 . 34 . 17	



# APPENDIX: 7-SEGMENT DISPLAY CHARACTERS

Number	Display	Letter	Display	Letter	Display
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	





