

# **GX-K series** **GF-K series** **Options**

## **INSTRUCTION MANUAL**

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- GX-04K** (Comparator output / RS-232C /  
Current loop output)
- GX-06K** (Analog output / Current loop output)

The logo for A&D Company, Limited, featuring the letters 'A' and 'D' in a bold, stylized, black font. The 'A' and 'D' are connected at the top, and the ampersand is integrated into the design.

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# 1. Introduction

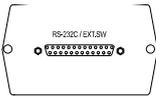
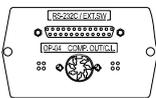
This manual describes how the GX-K series and GF-K series options, GX-04K and GX-06K work, and how to get the most out of them in terms of performance. Read this manual thoroughly before using either option and keep it at hand for future reference.

# 2. Description Of The Options

The description of the options is as follows:

GX-04K      Comparator output with a buzzer / RS-232C / Current loop output  
 GX-06K      Analog output / Current loop output

## Functions and panel view

	Function				Panel view
	RS-232C	Current loop output	Comparator output	Analog output	
Standard	○	—	—	—	
GX-04K	○	○	○	—	
GX-06K	—	○	—	○	

○:Available, —:Not available

### Notes

- **Options GX-04K and GX-06K can not be used at the same time. The current loop interface is of the passive type, and an external power supply that provides 20 mA, is required. The external power supply is not necessary when connecting an AD-8121B printer with this current loop interface.**
- **When option GX-04K or GX-06K is used, the balance does not comply with IP65 (Dust-tight and Protected Against Water Jets). So, handle the scale with much care when either option is installed.**

- Comparator output
  - Contact-outputs, output the comparison results between the weighing data and upper/lower limit values, using **HI**, **OK**, and **LO**.
  - Whether or not to sound a buzzer, depending on the results, can be selected.
- Analog output
  - Two modes are available: To convert the specified weight value digits to voltage, and to convert the weight value, in the range from zero to the weighing capacity, to voltage.
  - Output voltage range selection: Using the slide switch (0V~/0.2V~) located on the option panel, the output voltage range can be switched between 0 V to 1 V and 0.2 V to 1V. The default setting at shipment is 0 V to 1 V.
- RS-232C
 

The RS-232C interface is used to communicate with a printer or a personal computer. Using the RS-232C interface, the following operations are available through a command from the computer:

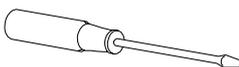
  - Outputs the weighing data.
  - Controls the balance.
  - Enter balance settings.
  - Reads the balance settings.
- Current loop
 

Current loop is a data output interface, mainly used as a printer interface.
- GLP output
 

GLP-compliant data output is available for RS-232C and current loop. Refer to the balance instruction manual for details about GLP output.

## 2-1. Accessories

Each option is provided with the following accessories.

- |                                                                                      |                                                                |                                                                                       |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>□ GX-04K: DIN connector (plug)</li> </ul>     | <ul style="list-style-type: none"> <li>1 piece.....</li> </ul> |  |
| <ul style="list-style-type: none"> <li>Instruction manual (this document)</li> </ul> | <ul style="list-style-type: none"> <li>1 copy</li> </ul>       |                                                                                       |
| <ul style="list-style-type: none"> <li>□ GX-06K: DIN connector (plug)</li> </ul>     | <ul style="list-style-type: none"> <li>1 piece.....</li> </ul> |  |
| <ul style="list-style-type: none"> <li>Screwdriver</li> </ul>                        | <ul style="list-style-type: none"> <li>1 piece.....</li> </ul> |  |
| <ul style="list-style-type: none"> <li>Instruction manual (this document)</li> </ul> | <ul style="list-style-type: none"> <li>1 copy</li> </ul>       |                                                                                       |

## 3. Function Table

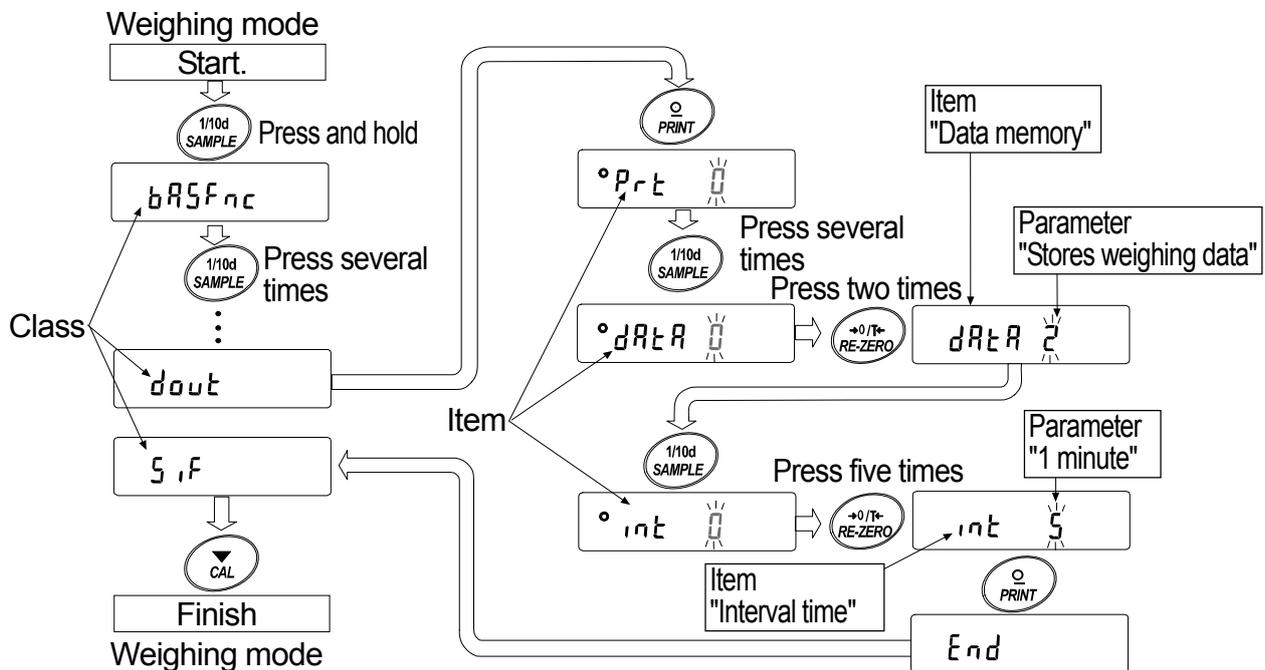
The function table reads or rewrites the parameters that are stored in the balance. When GX-04K or GX-06K is used, set the function table to specify the balance performance. These parameters are maintained in non-volatile memory, even if the AC adapter is removed.

### 3-1-1. Structure And Sequence Of The Function Table

This function table menu consists of two layers. The first layer is the "Class" and the second layer is the "Item". It has effect that a parameter is stored in each item and is displayed latest. New parameters are applied to the balance after the **PRINT** key is pressed.

#### Example

This example sets "Stores weighing data" for "Data memory" and "1 minute" for "Interval time".



#### Caution

Check the settings and condition before changing parameters.

### 3-1-2. Display And Operation Keys

	The symbol "O" shows effective parameter.
	When pressed and held in the weighing mode, enters the function table mode. Selects the class or item in the function table mode.
	Changes the parameter.
	When a class is displayed, moves to an item in the class. When an item is displayed, stores the new parameter and displays the next class.
	When an item is displayed, cancels the new parameter and displays the next class. When a class is displayed, exits the function table mode and returns to the weighing mode.

## 3-2. Details Of The Function Table

Class	Item and Parameter	Description				
bRSFnc Environment Display	C <sub>ond</sub> Condition	0	Fast response, sensitive value	FAST	Can be changed by response adjustment. With "Hold I", sets the averaging time.	
		1	Slow response, stable value	MID		
	St-b Stability band width	0	Stable when within ±1 digit			The stabilization indicator illuminates with the display fluctuation within the range. With "Hold I", sets the stable range.
		1	Stable when within ±3 digits			
	Hold Hold function	0	OFF			Holds the display when stable in animal mode. With "Hold I", [ANIMAL] turns on.
		1	ON			
	Zrc Zero tracking	0	OFF			Keeps zero display by tracking zero drift.
		1	Normal			
		2	Strong			
	SPd Display refresh rate	0	5 times/second			Period to refresh the display
		1	10 times/second			
	Pnt Decimal point	0	Point (.)			Decimal point format
1		Comma (,)				
P-on Auto display-ON	0	OFF			Turns on the weighing mode display when the AC adapter is connected.	
	1	ON				
P-off Auto display-OFF	0	OFF			Turns off the display after 10 minutes of inactivity.	
	1	ON (10 minutes)				
CS <sub>i</sub> Capacity indicator	0	OFF			Capacity indicator. Zero: 0% Maximum capacity: 100%	
	1	ON				
Add Accumulation function	0	OFF			Displays and outputs the total value of the weighing data.	
	1	ON				
rnG Display at start	0	Displays			Select whether or not to display the smallest displayable weighing value at weighing start.	
	1	Does not display				
CL Add Clock ☆	Refer to the balance instruction manual, "Clock and Calendar Function".				Confirms and sets the time and date. The time and date are added to the output data.	
CP Fnc Comparator	CP Comparator mode	0	No comparison			
		1	Comparison, excluding "near zero" when stable value or overloaded			
		2	Comparison, including "near zero" when stable value or overloaded			
		3	Continuous comparison, excluding "near zero"			
		4	Continuous comparison, including "near zero"			
	CP <sub>in</sub> Data input method	0	Sets the upper / lower limit value	Select CP <sub>H</sub> or CP <sub>Lo</sub> .		
		1	Sets the reference value	Select CP <sub>REF</sub> or CP <sub>Limit</sub> .		
	CP-r Comparison results	0	Not added	Select whether or not to add the comparison results to the output data.		
		1	Added			
	CP-b Main display comparison	0	OFF	Displays the results on the main portion of the display in place of the weight value.		
1		ON				
Displayed only when Comparator output (GX-04K) is installed	bEP <sub>-</sub> LO buzzer	0	OFF	Select whether or not to sound the LO buzzer.		
	bEP <sub>-</sub> OK buzzer	0	OFF	Select whether or not to sound the OK buzzer.		
	bEP <sub>-</sub> HI buzzer	0	OFF	Select whether or not to sound the HI buzzer.		

☆ : Functions for GX-K series. ■ : Factory settings. Digit is a unit of minimum weighing value.

Class	Item and Parameter	Description	
[P H <sub>1</sub> Upper limit	[P L <sub>0</sub> Lower limit	Refer to "4-4. Setting The Upper And Lower Limit Values"	Displayed when [P in 0] is selected.
[P rEF Reference value	[P Lnt Tolerance	Refer to "4-4. Setting The Upper And Lower Limit Values"	Displayed when [P in 1] is selected.
dout Data output	PrL Data output mode	0 Key mode	Accepts the [PRINT] key only when the display is stable.
		1 Auto print mode A (Reference = zero)	Outputs data when the display is stable and conditions of AP-P, AP-b and the reference value are met.
		2 Auto print mode B (Reference = last stable value)	
		3 Stream mode / Interval memory mode	With dAR 0, outputs data continuously; with dAR 2, uses interval memory.
	AP-P Auto print polarity	0 Plus only	Displayed value > Reference
		1 Minus only	Displayed value < Reference
		2 Both	Regardless of displayed value
	AP-b Auto print difference	0 10 digits	Difference between reference value and displayed value
		1 100 digits	
		2 1000 digits	
	dAR Data memory	0 Not used	Related items: PrL, int, d-no, S-td, info
		1 Stores unit mass in counting mode	
		2 Stores weighing data	
		☆ 3 Stores calibration data	
		4 Stores comparator settings	
		5 Stores tare value	
	int Interval time	0 Every measurement	Interval time in the interval memory mode when using PrL 3, dAR 2
		1 2 seconds	
		2 5 seconds	
		3 10 seconds	
		4 30 seconds	
		5 1 minute	
		6 2 minute	
		7 5 minute	
8 10 minute			
d-no Data number output	0 No output	Refer to the balance instruction manual, "DATA MEMORY"	
1 Output			
S-td ☆ Time/Date output	0 No output	Selects whether or not the time or date is added to the weighing data. Refer to the balance instruction manual, "Clock and Calendar Function".	
	1 Time only		
	2 Date only		
S-id ID number output	0 No output	Selects whether or not the ID number is output.	
	1 Output		

☆ : Functions for GX-K series. ■ : Factory settings. Digit is a unit of minimum weighing value.

Class	Item and Parameter	Description			
<i>dout</i> Data output	<i>PUSE</i> Data output pause	▪ 0 1	No pause Pause (1.6 seconds)	Selects the data output interval.	
	<i>At-F</i> Auto feed	▪ 0 1	Not used Used	Selects whether or not automatic feed is performed.	
	<i>info</i> GLP output	▪ 0 1 2	No output AD-8121 format General data format	Selects GLP output method. For how to set time and date to be added, refer to the balance instruction manual, "Clock and Calendar Function".	
	<i>Ar-d</i> Zero after output	▪ 0 1	Not used Used	Adjusts zero automatically after data is output	
	<i>SiF</i> Serial interface	<i>bPS</i> Baud rate	0 1 ▪ 2 3 4 5	600 bps 1200 bps 2400 bps 4800 bps 9600 bps 19200 bps	
<i>btPr</i> Data bit, parity bit			▪ 0 1 2	7 bits, even 7 bits, odd 8 bits, none	
<i>CrLF</i> Terminator			▪ 0 1	CR LF CR	CR: ASCII code 0Dh LF: ASCII code 0Ah
<i>tYPE</i> Data format			▪ 0 1 2 3 4 5	A&D standard format DP format KF format MT format NU format CSV format	Refer to the balance instruction manual, "Description of Item "Data Format".
<i>t-UP</i> Timeout			0 ▪ 1	No limit 1 second	Selects the wait time to receive a command.
<i>ErCd</i> AK, Error code			▪ 0 1	No output Output	AK: ASCII code 06h
<i>cts</i> CTS, RTS control		▪ 0 1	Not used Used	Controls CTS and RTS.	
<i>dS Fnc</i> Density function		<i>Ldin</i> Liquid density input	▪ 0 1	Water temperature Liquid density	Available only when density mode is selected
<i>nLt</i> Programmable-unit (Multi-unit)		Available only when programmable-unit mode is selected. Refer to the balance instruction manual, "Programmable Units" for details".			
<i>Unit</i> Unit		Refer to the balance instruction manual, "Weighing Units".			

☆ : Functions for GX-K series. ▪ : Factory settings. Digit is a unit of minimum weighing value.

### Caution

The balance may not transmit the data completely at the specified refresh rate, depending on the baud rate or data added to the weighing data such as time, date and ID number.

Class	Item and Parameter	Description	
$\overline{5}$ in ☆	Internal mass correction	Displayed only when the internal mass value correction switch is set to 1. Refer to the balance instruction manual, "Calibration".	
$A_{out}$ Analog output	$A_n$ Analog output mode	0	2-digit output
		1	3-digit output
		▪ 2	Net full scale output
		3	Gross full scale output
	$SEL$ Output digit selection	▪ 0	First digit
		1	Second digit
		2	Third digit
		3	Fourth digit
4		Fifth digit	
5	Sixth digit		
		Displayed only when the GX-06K option is installed. Refer to "6-3. Function Table Of The Analog Output" for detail.	
$id$	ID number setting	Refer to the balance instruction manual, "ID Number And GLP Report".	

☆ : Functions for GX-K series. ▪ : Factory settings. Digit is a unit of minimum weighing value.

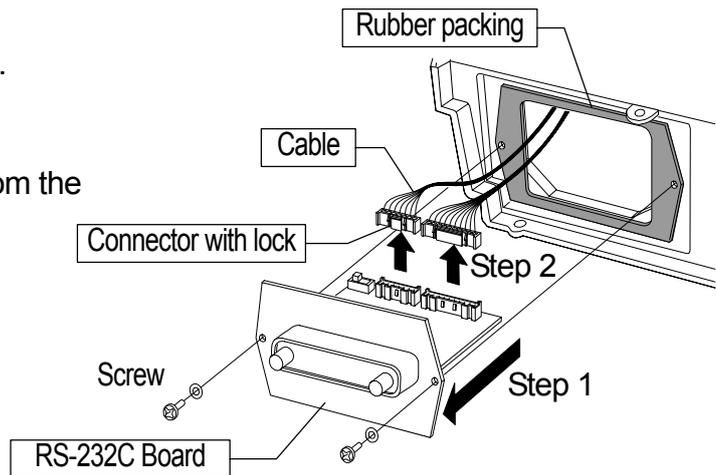
## 4. Comparator Output (GX-04K)

Comparator output, is the function to output the comparison results between the weighing data and upper/lower limit values. Whether or not to sound the buzzer when the output is conducting can be set.

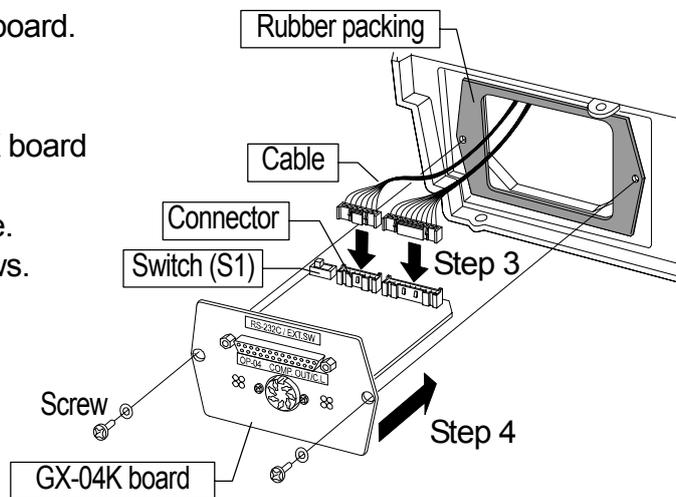
### 4-1. Installing The GX-04K

Install the GX-04K option in the following procedures:

1. Remove two screws.  
Remove the standard RS-232C board.
2. Unlock and remove two connectors from the standard RS-232C board.  
Do not pull the cable.



3. Connect two connectors to the GX-04K board.
4. Put the rubber packing between GX-04K board and the balance.  
Insert the GX-04K board into the balance.  
Fasten the GX-04K board with two screws.



#### Note

- Confirm right surface and direction of the option board, when the option is inserted.
- The position of the switch (S1) is free.
- The balance side of the rubber packing is the surface that there are gaps and ridges.

## 4-2. Comparator (GX-04K) Specifications

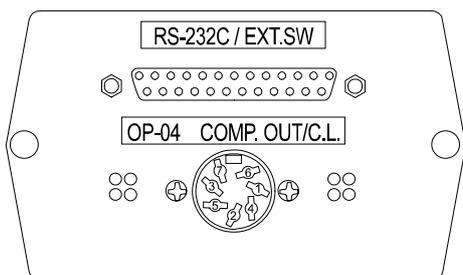
Maximum contact voltage: 100 VDC  
 Maximum contact current: 100 mA DC  
 Maximum contact resistance: 20 Ω

Comparator output judgement conditions (when upper limit value  $\geq$  lower limit value):

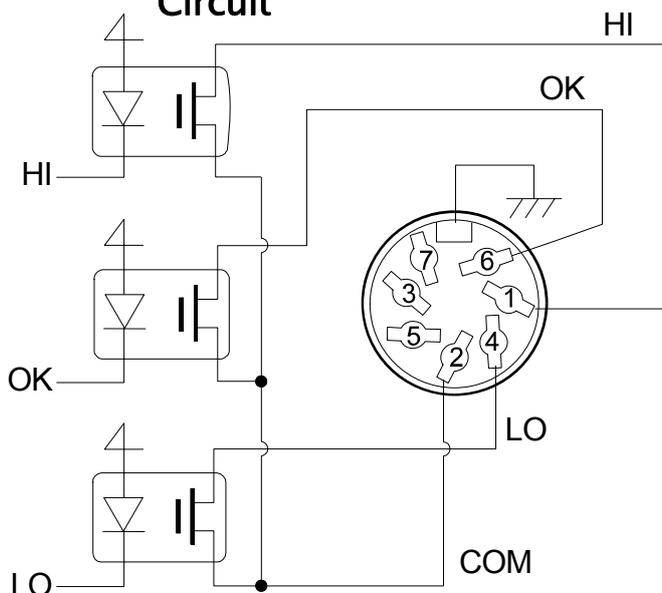
Weighing data > upper limit value: ..... Activates the HI comparator output.  
 Upper limit value  $\geq$  weighing data  $\geq$  lower limit value: ... Activates the OK comparator output.  
 Weighing data < lower limit value: ..... Activates the LO comparator output.

Reference value setting: Input the upper and lower limit values digitally or using a sample.  
 Contact output: Select whether or not to and how to compare, using "CP comparator mode" of the balance function table.  
 Buzzer: Select whether or not to sound the buzzer, using "bEP buzzer mode" of the balance function table.

### Panel View



### Circuit



### Pin Assignments

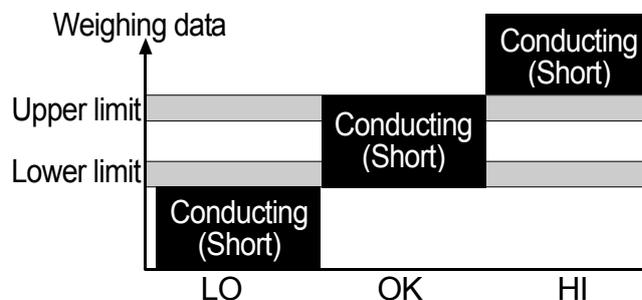
Pin No.	Description
1	<b>HI (Comparator)</b>
2	<b>COM (Comparator)</b>
3	Sending loop (Current loop)
4	<b>LO (Comparator)</b>
5	Sending loop (Current loop)
6	<b>OK (Comparator)</b>
7	No connection
Housing	Shield

For details on pins 3 and 5 of current loop, Refer to "5-2.Current Loop Output (GX-04K/GX-06K) Specifications".

## 4-3. Using The Comparator Output

To use the comparator output, perform the following four steps.

1. Connect the peripheral equipment to the option's 7-pin DIN connector.
2. Set the "Comparator ( $EP_{Fnc}$ )" parameter of the balance function table. For details, Refer to "3. Function Table".
3. Set the upper and lower limit values. For details, refer to "4-4. Setting The Upper And Lower Limit Values".
4. When performing a weighing, the comparison result is output. When the weighing data is equal to or less than the upper limit value, and equal to or greater than the lower limit value, the OK comparator will be output.



Comparator output	LO	OK	HI
Weighing data > upper limit	Open		Conducting (Short)
Upper limit $\geq$ weighing data $\geq$ lower limit	Conducting (Short)		
Weighing data < lower limit	Conducting (Short)	Open	

Whether or not to sound the buzzer, when the contact output is conducting can be set in the "Buzzer mode ( $bEP$ ) of the "Comparator ( $EP_{Fnc}$ )".

**Note** Make sure that the upper limit value is greater than the lower limit value.

### Comparator output

Class	Item and Parameter	Description	
$EP_{Fnc}$ Comparator	$EP$ Comparator mode	0 No comparison	
		1 Comparison, excluding "near zero" when stable value or overloaded	
		2 Comparison, including "near zero" when stable value or overloaded	
		3 Continuous comparison, excluding "near zero"	
$EP_{in}$ Data input method	0 Sets the upper / lower limit value	Select $EP_{Hi}$ or $EP_{Lo}$ .	
	1 Sets the reference value	Select $EP_{ref}$ or $EP_{Lnt}$ .	
$EP-r$ Comparison results	0 Not added	Select whether or not to add the comparison results to the output data.	
	1 Added		
$EP-b$ Main display comparison	0 OFF	Displays the results on the main portion of the display in place of the weight value.	
	1 ON		
Displayed only when Comparator output (GX-04K) is installed	$bEP_{-}$ LO buzzer	0 OFF 1 ON	Select whether or not to sound the LO buzzer.
	$bEP_{-}$ OK buzzer	0 OFF 1 ON	Select whether or not to sound the OK buzzer.
	$bEP_{-}$ HI buzzer	0 OFF 1 ON	Select whether or not to sound the HI buzzer.

Class	Item and Parameter	Description	
[P H]	Upper limit	Refer to "4-4. Setting The Upper And Lower Limit Values"	Displayed when [P in 0] is selected.
[P L]	Lower limit		
[P REF]	Reference value	Refer to "4-4. Setting The Upper And Lower Limit Values"	Displayed when [P in 1] is selected.
[P Lnt]	Tolerance		

▪ : Factory settings.

## 4-4. Setting The Upper And Lower Limit Values

The results of the comparison are indicated by **HI**, **OK** or **LO** on the display.

Operating conditions:

- No comparison
- Comparison when the weighing data is stable or overloaded, excluding "near zero"
- Comparison when the weighing data is stable or overloaded, including "near zero"
- Continuous comparison, excluding "near zero"
- Continuous comparison, including "near zero"

To compare, use:

- Upper limit value and lower limit value
- Reference value and tolerance value

Input method:

- Digital input
- Weighing input

"near zero" means that weighing value is within  $\pm 10$  digits from zero point.

Example: In case of GX-20K, the range of  $\pm 1.0g$  is "near zero".

### 4-4-1. Example 1

Comparison when the weighing data is stable or overloaded, excluding "near zero", upper limit and lower limit.

#### Selecting a comparator mode

- Step 1 Press and hold the **SAMPLE** key until **bASFnC** of the function table is displayed, then release the key.
- Step 2 Press the **SAMPLE** key several times to display **[P Fnc]**.
- Step 3 Press the **PRINT** key.
- Step 4 Press the **RE-ZERO** key several times to display **[P 1]**.
- Step 5 Press the **SAMPLE** key to display **[P in ]**.
- Step 6 Press the **RE-ZERO** key several times to display **[P in 0]**.
- Step 7 Press the **PRINT** key to store the selected mode.

## Entering the upper and lower limit values

- Step 8 With  $[EP H_1]$  displayed, press the  $[PRINT]$  key. The current setting of the upper limit value is displayed with all of the digits blinking.
- When the current setting is not to be changed, press the  $[PRINT]$  or  $[CAL]$  key to go to step 9.
  - When the current setting is to be changed, press the  $[RE-ZERO]$  key. The balance is now in the digital input mode. To use the weighing input mode, press and hold the  $[MODE]$  key.

### Digital input mode

Change the setting using the following keys.

$[SAMPLE]$  key.....To select the digit to change the value.

$[RE-ZERO]$  key ...To change the value of the digit selected.

$[MODE]$  key.....To switch the polarity.

$[PRINT]$  key.....To store the new setting and go to step 9.

$[CAL]$  key.....To cancel the new setting and go to step 9.

### Weighing input mode

Press the  $[RE-ZERO]$  key. The balance displays  $[00g]$ . Place a sample, with a mass that corresponds to the upper limit value, on the pan. Press the  $[PRINT]$  key to store the upper limit value. Remove the sample. The balance displays  $[EP L_0]$ .

- Step 9 With  $[EP L_0]$  displayed, press the  $[PRINT]$  key. The current setting of the lower limit value is displayed with all of the digits blinking.
- When the current setting is not to be changed, press the  $[PRINT]$  or  $[CAL]$  key to go to step 10.
  - When the current setting is to be changed, press the  $[RE-ZERO]$  key. The balance is now in the digital input mode. To use the weighing input mode, press and hold the  $[MODE]$  key. Enter the lower limit value in the same way as described in step 8. Then, go to step 10.
- Step 10 Press the  $[CAL]$  key to exit the comparator function and return to the weighing mode.

## 4-4-2. Example 2

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Continuous comparison, including "near zero", reference value and tolerance value.

### Selecting a comparator mode

- Step 1 Press and hold the  $[SAMPLE]$  key until  $[bRSFnC]$  of the function table is displayed, then release the key.
- Step 2 Press the  $[SAMPLE]$  key several times to display  $[EP FnC]$ .
- Step 3 Press the  $[PRINT]$  key.
- Step 4 Press the  $[RE-ZERO]$  key several times to display  $[EP 4]$ .
- Step 5 Press the  $[SAMPLE]$  key to display  $[EP in]$ .
- Step 6 Press the  $[RE-ZERO]$  key several times to display  $[EP in 1]$ .
- Step 7 Press the  $[PRINT]$  key to store the selected mode.

## Entering the reference and tolerance values

- Step 8 With  $\boxed{EP REF}$  displayed, press the  $\boxed{PRINT}$  key. The current setting of the reference value is displayed with all the digits blinking.
- When the current setting is not to be changed, press the  $\boxed{PRINT}$  or  $\boxed{CAL}$  key to go to step 9.
  - When the current setting is to be changed, press the  $\boxed{RE-ZERO}$  key. The balance is now in the digital input mode. To use the weighing input mode, press and hold the  $\boxed{MODE}$  key.

### Digital input mode

Change the setting using the following keys.

- $\boxed{SAMPLE}$  key ..... To select the digit to change the value.
- $\boxed{RE-ZERO}$  key ..... To change the value of the digit selected.
- $\boxed{MODE}$  key ..... To switch the polarity.
- $\boxed{PRINT}$  key ..... To store the new setting and go to step 9.
- $\boxed{CAL}$  key ..... To cancel the new setting and go to step 9.

### Weighing input mode

Press the  $\boxed{RE-ZERO}$  key. The balance displays  $\boxed{00 g}$ . Place a sample, with a mass that corresponds to the reference value, on the pan. Press the  $\boxed{PRINT}$  key to store the reference value. Remove the sample. The balance displays  $\boxed{EP Lnt}$ .

- Step 9 With  $\boxed{EP Lnt}$  displayed, press the  $\boxed{PRINT}$  key. The current setting of the tolerance value is displayed with all the digits blinking.
- When the current setting is not to be changed, press the  $\boxed{PRINT}$  or  $\boxed{CAL}$  key to go to step 10.
  - When the current setting is to be changed, press the  $\boxed{RE-ZERO}$  key. The balance is now in the digital input mode. Change the setting using the following keys.
- $\boxed{SAMPLE}$  key ..... To select the digit to change the value.
  - $\boxed{RE-ZERO}$  key ..... To change the value of the digit selected.
  - $\boxed{PRINT}$  key ..... To store the new setting and go to step 10.
  - $\boxed{CAL}$  key ..... To cancel the new setting and go to step 10.

**Note** Enter the tolerance value in percentage, with the reference value as 100%.  
Only the digital input mode is available for setting the tolerance value.  
The  $\boxed{MODE}$  key is not used to set the tolerance value.

- Step 10 Press the  $\boxed{CAL}$  key to exit the comparator function and return to the weighing mode.
- Note** When Pound/Ounce is selected as a weighing unit, enter the values in ounces for comparison.  
In the density mode, comparison is performed to the density obtained.

## 4-5. Example Of Use

The following example uses the AD-8951 comparator light, which is sold separately, to display the comparison result in red, green, or orange.

- Using the AX-KO507-W200 cable, which is sold separately, connect the comparator light to the balance as shown below.

- Set the “Comparator ( $[P\ Fnc]$ )” of the balance function table as follows:

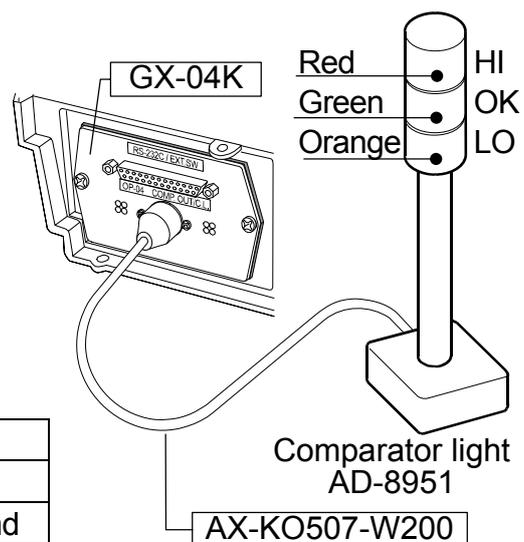
$[P\ 3]$  Compares the result excluding the data near zero continuously.  
 $[P\ in\ 0]$  Inputs the upper or lower limit values.  
 $bEP\ 1$  Sounds the buzzer for LO.  
 $bEP\ 0$  Does not sound the buzzer for OK.  
 $bEP\ 1$  Sounds the buzzer for HI.

- Set the upper and lower limit values as follows:

$[P\ H\ 1]$  1010.0 g (Upper limit)  
 $[P\ L\ 0]$  990.0 g (Lower limit)

- Functions of the comparator and buzzer are as follows, depending upon the comparison result.

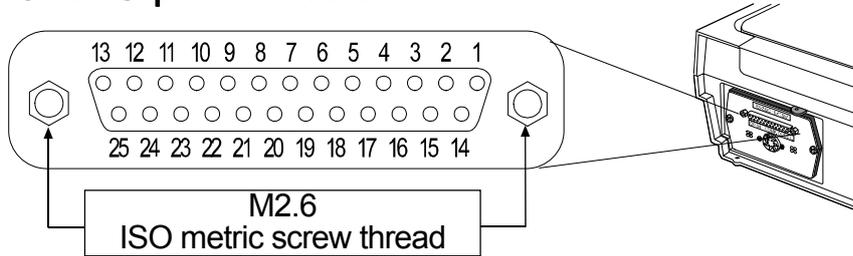
Weighing data	Comparator light	Buzzer
900.0 g	Orange	Sounds
1000.0 g	Green	Does not sound
1100.0 g	Red	Sounds



# 5. Serial Output

## 5-1. RS-232C (GX-04K) Specifications

### D-Sub 25 pin numbers



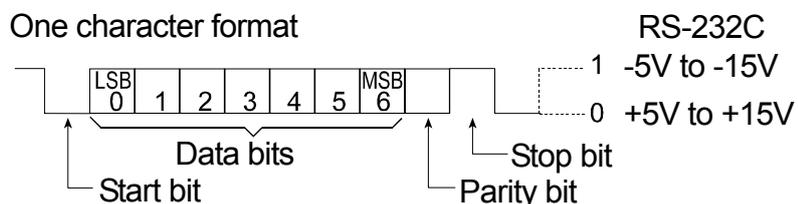
### D-Sub 25 pin assignments

Pin No.	Signal name	Interface type	Direction	Description
1	FG		–	Frame ground
2	RXD	RS-232C	Input	Receive data
3	TXD	RS-232C	Output	Transmit data
4	RTS	RS-232C	Input	Ready to send
5	CTS	RS-232C	Output	Clear to send
6	DSR	RS-232C	Output	Data set ready
7	SG	RS-232C / external contact input	–	Signal ground
18	PRINT	External contact input	Input	Same as the PRINT key
19	RE-ZERO	External contact input	Input	Same as the RE-ZERO key
Others	–	–	–	No connection

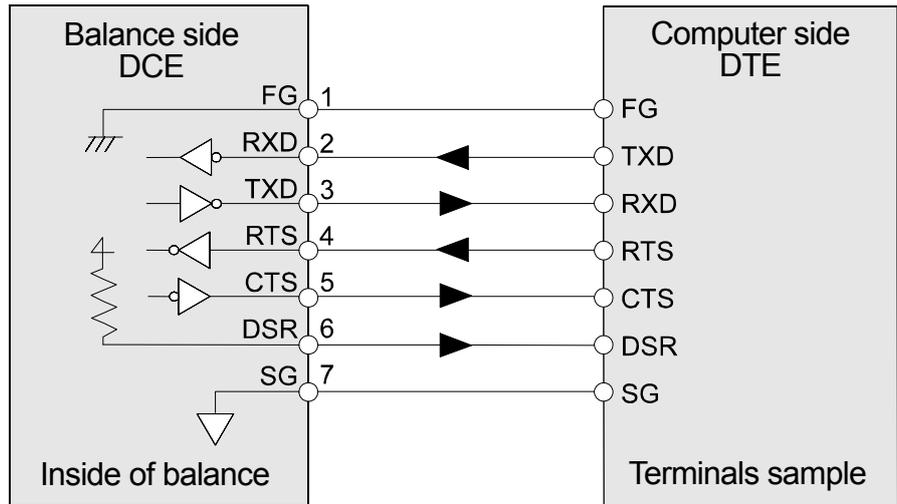
### RS-232C

The balance is a DCE device. Connect the balance to a personal computer (DTE) using a straight through cable.

- Transmission system : EIA RS-232C
- Transmission form : Asynchronous, bi-directional, half duplex
- Transmission rate : 10 times/second or 5 times/second (same as data refresh rate)
- Data format : Baud rate : 600, 1200, 2400, 4800, 9600, 19200 bps
  - Data bits : 7 or 8 bits
  - Parity : Even, Odd (Data bits 7 bits)
  - None (Data bits 8 bits)
  - Stop bit : 1 bit
    - (When sending, 2 bits; receiving, 1 bit.
    - A personal computer will function with either setting.)
- Code : ASCII



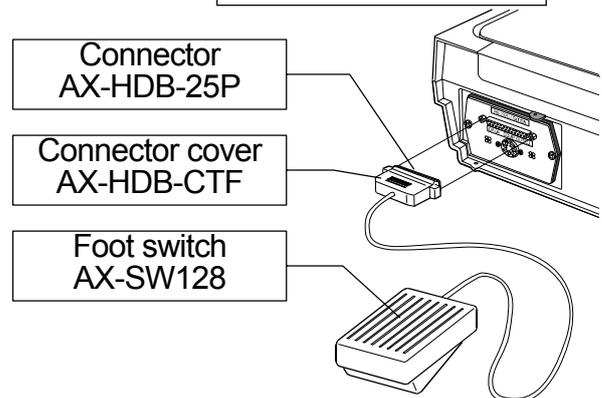
## RS-232C Terminals



### External contact input

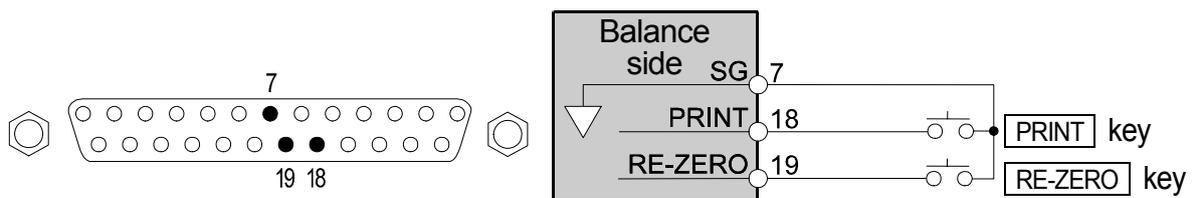
By connecting pin 18 (PRINT command) to pin 7, or pin 19 (RE-ZERO command) to pin 7 for 100 ms or more, the same operation as performed by pressing the **PRINT** key or the **RE-ZERO** key, will be performed.

Example of foot switch



### Accessory

- Connector : AX-HDB-25P/CTF
- Foot switch : AX-SW128

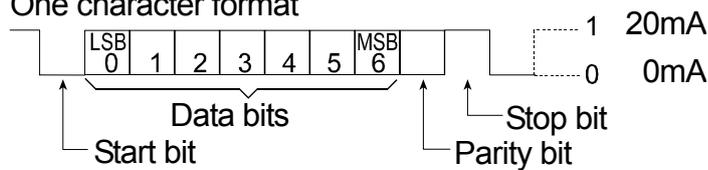


## 5-2. Current Loop Output (GX-04K/GX-06K) Specifications

The specifications of the current loop interface are as follows:

Transmission system : 20 mA current loop (Passive)  
 Transmission form : Asynchronous, uni-directional (Only from the balance)  
 Data format : Baud rate : 600, 1200, 2400, 4800, 9600, 19200 bps  
                   Data bits : 7 or 8 bits  
                   Parity : Even, Odd (Data bits 7 bits)  
                               None (Data bits 8 bits)  
 Stop bit : 1 bit  
 Code : ASCII

One character format



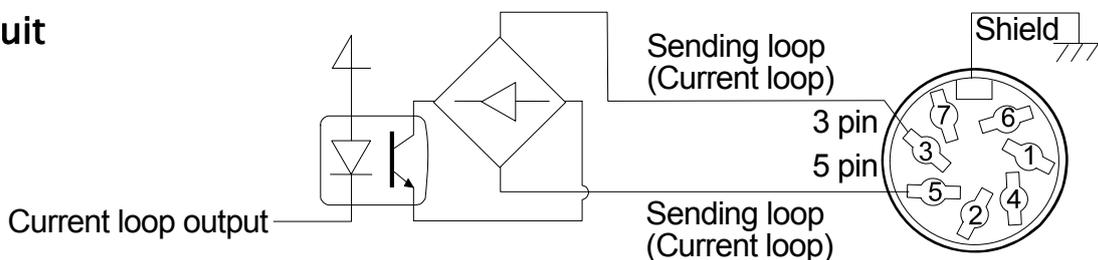
### Notes

To use current loop, an external power supply that provides 20 mA, is required.

The maximum rated voltage of the current loop is 25 V.

When a baud rate of 4800 bps or higher is used, communication may not be performed properly.

### Circuit



### Pin assignments

#### GX-04K

Pin No.	Description
1	HI (comparator)
2	COM (comparator)
3	<b>Sending loop (Current loop)</b>
4	LO (comparator)
5	<b>Sending loop (Current loop)</b>
6	OK (comparator)
7	No connection
Housing	Shield

#### GX-06K

Pin No.	Description
1	No connection
2	Analog GND (Analog output)
3	<b>Sending loop (Current loop)</b>
4	No connection
5	<b>Sending loop (Current loop)</b>
6	No connection
7	Analog output (Analog output)
Housing	Shield

For details on the comparator of GX-04K, Refer to “4-2. Comparator (GX-04K) Specifications”.

For details on the analog output of GX-06K, Refer to “6-2. Analog Output (GX-06K) Specifications”.

## 5-3. Connection Of The AD-8121B Printer

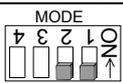
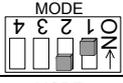
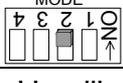
Preset the following parameters to use the AD-8121B printer.

Class	Item and Parameter	Factory settings	AD-8121B MODE 1	AD-8121B MODE 2	AD-8121B MODE 3
Data output	<i>Prt</i> Data output mode	0	0, 1, 2	3	0, 1, 2
	<i>AP-P</i> Auto print polarity	0	#1	Not necessary	#1
	<i>AP-b</i> Auto print difference	1			
	<i>d-no</i> Data number output	0	0	0	0, 1
	<i>S-t-d</i> Time/Date output	0	0	0	0, 1, 2, 3
	<i>S-id</i> ID number output	0	0	0	0, 1
	<i>PUSE</i> Data output pause	0	0	0	0, 1 #2
	<i>RF-F</i> Auto feed	0	0	0	0, 1
	Serial interface	<i>bPS</i> Baud rate	2	2	2
<i>btPr</i> Data bit, parity bit		0	0	0	0
<i>CrLF</i> Terminator		0	0	0	0
<i>TYPE</i> Data format		0	0	0	1
<i>cts</i> CTS, RTS control		0	0	0	0

#1 Set parameters when auto print mode A or B (*Prt* 1 or 2) is selected.

#2 Set 1 when multiple lines are printed. Example: When appending ID number, set 1.

### Settings of AD-8121B

MODE	AD-8121B DIP switch	Description
MODE 1		Print at receiving data. Standard mode, statistic mode
MODE 2		Print by <b>DATA</b> key operation or built-in timer. Standard mode, interval mode, chart mode
MODE 3		Print at receiving data. Dump print mode

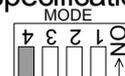
DIP switch No.3 : Handling unstable data

ON Print  
OFF Not printed



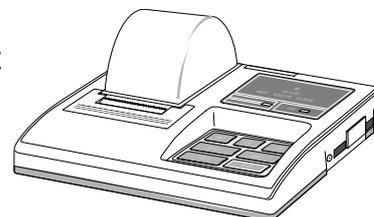
DIP switch No.4 : Data input specifications

ON Current loop  
OFF RS-232C



- Refer to print samples of "GLP Report" in the instruction manual of GX-K/GF-K series.
- **GF-K series does not output the time and date. Use the calendar function of the AD-8121B.**
- **GF-K series does not store the calibration report in memory.**
- AD-8121B Printer

- Compact dot-matrix printer
- Statistical function, clock and calendar function, interval print function, graphic print function, dump print mode
- 5 x 7 dots, 16 characters per line
- Print paper (AX-PP143, 45 (W) x 50 (L) mm , ø65 mm)
- AC adapter or alkaline battery



## 5-4. Description Of The Item "Data output mode"

The parameter setting of "Data output mode (*Prt*)" applies to the performance when the "Data memory (*dMEm*)" parameter is set to "2" (to store the weighing data) and when the data is transmitted using the RS-232C interface.

### Key mode

When the PRINT key is pressed with the stabilization indicator turned on, the balance outputs or stores the weighing data and the display blinks one time.

Required setting    *dout Prt 0*    Key mode

### Auto print modes A and B

When the displayed value is stable and the conditions of "Auto print polarity", "Auto print difference" and reference value are met, the balance outputs or stores the weighing data.

When the PRINT key is pressed with the stabilization indicator turned on, the balance outputs or stores the data and the display blinks one time.

#### Auto print modes A

Example                      For weighing each time a sample is placed and removed, with "*Pr-d*" set to "1" (to adjust zero after the data is output).

Required setting    *dout Prt 1*    Auto print mode A (reference = zero)  
*dout AP-P*    Auto print polarity  
*dout AP-b*    Auto print difference  
*dout Pr-d 1*    Zero after output

#### Auto print modes B

Example                      For weighing while a sample is added.

Required setting    *dout Prt 2*    Auto print mode B (reference = last stable value)  
*dout AP-P*    Auto print polarity  
*dout AP-b*    Auto print difference

### Stream mode

The balance outputs the weighing data continuously regardless of the display condition. The display does not blink in this mode. The interval memory mode is used when the "Data memory (*dMEm*)" parameter is set to "2" (to store the weighing data).

Example                      For monitoring data on a computer.

Required setting    *dout Prt 3*    Stream mode  
*dout dMEm 0*    Data memory function is not used  
*bRSFnc SPd*    Display refresh rate  
*SIF bPS*        Baud rate

**Caution**    The balance may not transmit the data completely at the specified refresh rate, depending on the baud rate or data added to the weighing data such as time, date and ID number.

## Interval memory mode

The weighing data is periodically stored in memory.

Example	For periodical weighing without a personal computer command and to output all of the data, to a computer, at one time.		
	The GX-K series can use time and date with "Time/Date output (S-t d)".		
Required setting	<i>dout</i> Prt 3	Interval memory mode	
	<i>dout</i> dARR 2	Data memory function is used	
	<i>dout</i> int	Interval time	
Optional setting	<i>dout</i> S-t d 1, 2, or 3	Adds the time and date.	

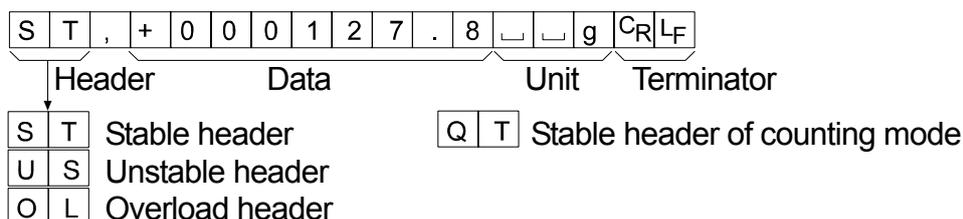
## 5-5. Description Of The Item "Data format"

### A&D standard format *S IF TYPE 0*

This format is used when the peripheral equipment can receive the A&D format.

If an AD-8121B is used, set the printer to MODE 1 or 2.

- This format consists of fifteen characters excluding the terminator.
- A header of two characters indicates the balance condition.
- The polarity sign is placed before the data with the leading zeros. If the data is zero, the plus sign is applied.
- The unit, consisting of three characters, follows the data.

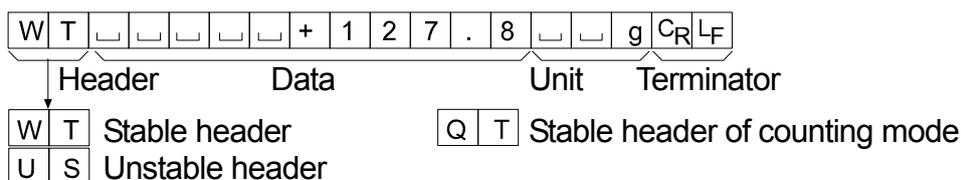


### DP (Dump print) format *S IF TYPE 1*

This format is used when the peripheral equipment can not receive the A&D format.

If an AD-8121B is used, set the printer to MODE 3.

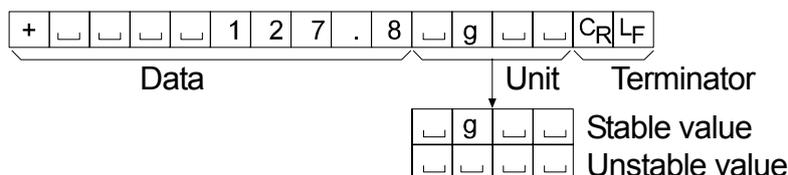
- This format consists of sixteen characters excluding the terminator.
- A header of two characters indicates the balance condition. No overload header is used.
- The polarity sign is placed before the data, with spaces in place of leading zeros, if the data is not zero or overloaded.
- The unit, consisting of three characters, follows the data.



## KF format 5 IF TYPE 2

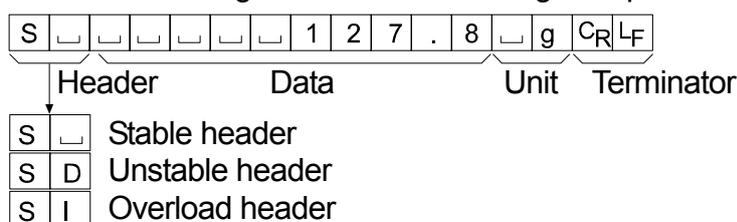
This is the Karl-Fischer moisture meter format and is used when the peripheral equipment can only communicate using this format.

- This format consists of fourteen characters excluding the terminator.
- This format has no header characters.
- The polarity sign is placed before the data, with spaces in place of leading zeros, if the data is not zero or overloaded.
- This format outputs the unit only for a stable value.



## MT format 5 IF TYPE 3

- A header of two characters indicates the balance condition.
- The polarity sign is used only for negative data.
- The weighing data uses spaces in place of the leading zeros.
- The character length of this format changes dependent upon the unit



## NU (numerical) format 5 IF TYPE 4

This format outputs only numerical data.

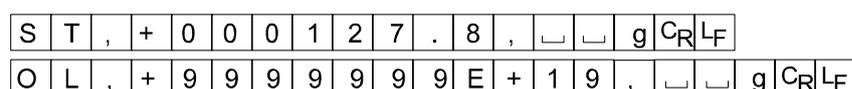
- This format consists of nine characters excluding the terminator.
- The polarity sign is placed before the data with the leading zeros. If the data is zero, the plus sign is used.



## CSV format 5 IF TYPE 5

- This format separates the data of A&D standard format and the unit by a comma ( , ).
- This format outputs the unit even when the data is overloaded.
- When the ID number, data number, time and date are added at "Data output (*dout*)" of the function table, outputs ID number, data number, date, time and weighing data in this order and separates each item by a comma and treats all the items as one group of data.

**Note** GF-K series can not add the format of time and date.



## 5-6. Description Of The Data Format Added To the Weighing Data

### ID number *dout 5-id 1*

The number to identify a specific balance.

- This format consists of seven characters excluding the terminator.

L	A	B	-	1	2	3	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	----------------	----------------

### Data number *dout d-no 1*

This format outputs the data number just before the data is transmitted using the RS-232C interface.

- This format consists of six characters excluding the terminator.
- When CSV format (*5 IF TYPE 5*) is selected, the period (.) is replaced with a comma (,).

N	o	.	0	0	1	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	----------------	----------------

Data number Terminator

### Date *dout 5-td 2 or 3*

- The date output order can be changed in "Clock (*EL Add*)".  
The year is output in a four-digit format.

2	0	0	4	/	1	2	/	3	1	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	----------------	----------------

**Note** GF-K series does not use this format.

### Time *dout 5-td 1 or 3*

- This format outputs time in 24-hour format.

1	2	:	3	4	:	5	6	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	----------------	----------------

**Note** GF-K series does not use this format.

### Tare value

- When the tare value in memory is recalled, the tare value is output before the weighing data.

P	T	,	+	0	0	0	1	2	3	.	4	□	□	g	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

 Tare value recalled from memory

N	□	,	+	0	0	0	5	6	7	.	8	□	□	g	C <sub>R</sub>	L <sub>F</sub>
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

 Net value

### Comparison results

- By setting "Comparison results (*CP-r*)" of the function table to "I", the comparison results can be added to the data output using the RS-232C serial interface. Use A&D standard format (*TYPE 0*). The comparison results are added after the header in A&D standard format as below.

S	T	,	O	K	,	+	0	1	2	3	4	5	.	6	□	□	g	C <sub>R</sub>	L <sub>F</sub>
Header			Data													Unit		Terminator	
			Comparison result																
H	I	When the comparison result is HI																	
O	K	When the comparison result is OK																	
L	O	When the comparison result is LO																	
-	-	Not applicable																	

**Note**

When the data described above is added to the weighing data, the output is in the following order: ID number, Data number, Date, Time and Weighing data.

# 5-7. Data Format Examples

## Stable

◦ 12.7 g

A&D	S	T	,	+	0	0	0	0	1	2	.	7	␣	␣	g	C <sub>R</sub>	L <sub>F</sub>	
DP	W	T	␣	␣	␣	␣	␣	␣	+	1	2	.	7	␣	␣	g	C <sub>R</sub>	L <sub>F</sub>
KF	+	␣	␣	␣	␣	␣	␣	1	2	.	7	␣	g	␣	␣	C <sub>R</sub>	L <sub>F</sub>	
MT	S	␣	␣	␣	␣	␣	␣	␣	1	2	.	7	␣	g	C <sub>R</sub>	L <sub>F</sub>		
NU	+	0	0	0	0	1	2	.	7	C <sub>R</sub>	L <sub>F</sub>							

## Unstable

-1836.9 g

A&D	U	S	,	-	0	0	1	8	3	6	.	9	␣	␣	g	C <sub>R</sub>	L <sub>F</sub>	
DP	U	S	␣	␣	␣	␣	-	1	8	3	6	.	9	␣	␣	g	C <sub>R</sub>	L <sub>F</sub>
KF	-	␣	␣	␣	1	8	3	6	.	9	␣	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>		
MT	S	D	␣	␣	␣	-	1	8	3	6	.	9	␣	g	C <sub>R</sub>	L <sub>F</sub>		
NU	-	0	0	1	8	3	6	.	9	C <sub>R</sub>	L <sub>F</sub>							

## Overload

Positive error

E g

A&D	O	L	,	+	9	9	9	9	9	9	9	E	+	1	9	C <sub>R</sub>	L <sub>F</sub>
DP	␣	␣	␣	␣	␣	␣	␣	␣	E	␣	␣	␣	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>
KF	␣	␣	␣	␣	␣	␣	H	␣	␣	␣	␣	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>	
MT	S	I	+	C <sub>R</sub>	L <sub>F</sub>												
NU	+	9	9	9	9	9	9	9	9	C <sub>R</sub>	L <sub>F</sub>						

## Overload

Negative error

-E g

A&D	O	L	,	-	9	9	9	9	9	9	9	E	+	1	9	C <sub>R</sub>	L <sub>F</sub>
DP	␣	␣	␣	␣	␣	␣	-	E	␣	␣	␣	␣	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>
KF	␣	␣	␣	␣	␣	␣	L	␣	␣	␣	␣	␣	␣	␣	C <sub>R</sub>	L <sub>F</sub>	
MT	S	I	-	C <sub>R</sub>	L <sub>F</sub>												
NU	-	9	9	9	9	9	9	9	9	C <sub>R</sub>	L <sub>F</sub>						

- ␣ Space, ASCII 20h
- C<sub>R</sub> Carriage Return, ASCII 0Dh
- L<sub>F</sub> Line Feed, ASCII 0Ah

## Units

		A&D	D.P.	KF	MT
g	<b>g</b>	□□g	□□g	□g□□	□g
kg	<b>kg</b>	□kg	□kg	□kg□	□kg
Counting mode	<b>pcs</b>	□PC	□PC	□pc s	□PC S
Precent mode	<b>%</b>	□□%	□□%	□%□□	□%
Ounce (Avoir)	<b>oz</b>	□oz	□oz	□oz□	□oz
Pound	<b>lb</b>	□lb	□lb	□lb□	□lb
Pound Ounce	<b>lb oz</b>	□oz	□oz	□oz□	□oz
Troy Ounce	<b>oz t</b>	oz t	oz t	□oz t	□oz t
Metric Carat	<b>ct</b>	□ct	□ct	□ct□	□ct
Momme	<b>mom</b>	mom	mom	□mom	□mo
Pennyweight	<b>dwt</b>	dwt	dwt	□dwt	□dwt
Grain	<b>GN</b>	□GN	□GN	□gr□	□GN
Tael (HK general, Singapore)	<b>TL</b>	□tl	□tl	□tl s	□tl
Tael (HK, jewelry)	<b>TL</b>	□tl	□tl	□tl h	□tl
Tael (Taiwan)	<b>TL</b>	□tl	□tl	□tl t	□tl
Tael (China)	<b>TL</b>	□tl	□tl	□tl c	□tl
Tola (India)	<b>t</b>	□□t	□□t	□t o l	□t
Messghal	<b>MS</b>	mes	mes	□MS□	□m
Density	<b>DS</b>	□DS	□DS	□DS□	□DS
Multi	(Blank)	□□□	□□□	□□□□	□

□ Space, ASCII 20h

### Note

When "Pound Ounce" is selected, the data is output with the unit of ounce (oz).  
The unit Grain is not available for the GX-32K and GF-32K.

## 5-8. Connection To A Computer And The Use Of WinCT

The balance is of the DCE type (Data Communication Equipment), which can be connected to a personal computer using the RS-232C interface. Before connection, read the personal computer manual thoroughly. Use a standard DCE cable for connection (cable type: straight-through). When the personal computer type is a DOS/V with a 9-pin port, use a straight-through cable with a 25-pin male connector and a 9-pin female connector.

### Using Windows Communication Tools Software (WinCT)

When Windows is used as an operating system in a personal computer, the provided WinCT software can be used to transmit the weighing data to the personal computer.

The WinCT software has two communication methods: "RsCom" and "RsKey". Refer to the WinCT instruction manual.

#### RsCom

- RsCom can transmit commands to control the balance.
- RsCom can make bi-directional communication between the balance and a personal computer using the RS-232C interface.
- RsCom can display or store the data using a text file format. RsCom can also print the data using a printer connected to the personal computer.
- When several ports of a personal computer have balances connected, can communicate with each balance simultaneously.
- RsCom can share a personal computer with other application software.
- RsCom can receive the balance GLP report.

#### RsKey

- RsKey can transmit the weighing data output from the balance directly to other application software such as Microsoft Excel.
- RsKey can be used with most application software.
- RsKey can receive the balance GLP report.

### Using the WinCT software, the balance can do the following:

- **Analyzing the weighing data and the statistics with "RsKey"**  
The weighing data can be input directly into an Excel worksheet. Then, Excel can analyze the data to obtain total, average, standard deviation, maximum and minimum value, and display them in a graph.
- **Controlling the balance using commands from a personal computer**  
By using "RsCom", the personal computer sends commands such as "re-zero" or "send weighing data" to the balance and controls the balance.
- **Printing the balance GLP report using your printer**  
The balance GLP report can be printed using a printer connected to the personal computer.
- **Receiving weighing data at a certain interval**  
The weighing data can be received at a certain interval and data characteristic with elapsed time can be obtained.
- **Using the balance memory function**  
The data can be stored in the balance's memory. Of the data stored, the weighing data and calibration data can be transmitted to a personal computer at one time.
- **Using a personal computer as an external indicator**  
With the "RsKey" test mode function, a personal computer can be used as an external weight indicator for the balance. (To do this, set the balance data output mode to stream mode.)

## 5-9. Commands

**Note** A command has a terminator added, that is specified using "SIF CrLF" of the function table, and is sent to the balance.

Commands to query weighing data	
C	Cancels the S or SIR command.
Q	Requests the weighing data immediately.
S	Requests the weighing data when stabilized.
SI	Requests the weighing data immediately.
SIR	Requests the weighing data continuously.

Commands to control the balance	
?CN	Requests the upper/lower limit value code number of the selected value.
?HI	Requests the upper limit value.
?ID	Requests the identification number.
?LO	Requests the lower limit value.
?MA	Outputs all weighing data in memory.
?MQnnn	Outputs data with the data number nnn. nnn: Three digits
?MX	Outputs the number of data in memory (the last data number)
?PN	Request the tare number of the selected value.
?PT	Request the tare value.
?SN	Request the serial number of the balance.
?TN	Request the model name of the balance.
?UN	Requests the unit mass numbers in memory.
?UW	Requests the unit mass value.
CAL	Same as the <b>CAL</b> key.
CN:mm	Recalls the upper/lower limit value in memory. mm: 01 to 20.
HI:*****.*_ _g	Sets the upper limit values. _ is space mark. Example: the upper limit value is 2000.0 g. Command: HI:+002000.0_ _g
ID:*****	Sets identification number.
LO:*****.*_ _g	Sets the lower limit values. _ is space mark. Example: the lower limit value is 1000.0 g. Command :LO:+001000.0_ _g
MCL	Deletes all data in memory.
MD:nnn	Deletes data with the data number nnn. nnn: Three digits.
OFF	Turns the display off.
ON	Turns the display on.
P	Same as the <b>ON:OFF</b> key
PN:mm	Recalls the tare value in memory. mm: 01 to 20.
PRT	Same as the <b>PRINT</b> key
PT:*****.*_ _g	Sets the tare value. _ is space mark. Example: the tare value is 1000.0 g. Command :PT:+001000.0_ _g
R	Same as the <b>RE-ZERO</b> key
SMP	Same as the <b>SAMPLE</b> key.
U	Same as the <b>MODE</b> key

Commands to control the balance	
UN:mm	Recalls the unit mass values in memory. mm: 01 to 50.
UW:*****.*_ _g	Changes the unit mass value. Use "g" of unit. _ is space mark. Example: the unit mass value is 2000.0 g. Command: UW: +002000.0_ _g

When a unit is required in commands such as a "PT:" command, use the 3-digit unit code of the A&D standard format.

nnn indicates a three-digit numerical value.

## 5-10. Acknowledge Code And Error Codes

When the "Serial interface function (SIF)" parameter is set to "Error I", the balance outputs <AK> code or error code to each command as follows:

<AK> (06h) Acknowledge in ASCII code.

- When the balance receives a command to request data and can not process it, the balance transmits an error code (EC, E<sub>xx</sub>).

When the balance receives a command to request data and can process it, the balance outputs the data.

- When the balance receives a command to control the balance and can not process it, the balance transmits an error code (EC, E<sub>xx</sub>).

When the balance receives a command to control the balance and can process it, the balance transmits the acknowledge code.

Among commands to control the balance, the following transmit the acknowledge code both when the balance receives the command and when the balance has accomplished the command. If the command can not be processed properly, the balance transmits an error code (EC, E<sub>xx</sub>). This error can be released using the CAL command.

CAL command (Calibration command using internal mass)

ON command (Display ON command)

P command (Display ON/OFF command)

R command (RE-ZERO command)

- When a communication error has occurred due to external noise, or a parity error has occurred due to transmission error, the balance transmits an error code. In this case, send the command again.

xx is error code number.

## 5-11. Control Using CTS And RTS

Depending on the "CTS" parameter of "Serial interface (S, F)", the balance performs as follows:

### CTS 0

Regardless of whether the balance can receive a command or not, the balance keeps the CTS line Hi. The balance outputs data regardless of the condition of the RTS line.

### CTS 1

The CTS line is kept Hi normally. When the balance can not receive the next command (Example: while the balance is processing the last command), the balance sets the CTS line to Lo. The balance confirms the level of the RTS line before outputting a set of data. If the RTS level is Hi, the balance outputs data. If the RTS level is Lo, data is not output (The data is canceled).

## 5-12. Settings Related To RS-232C

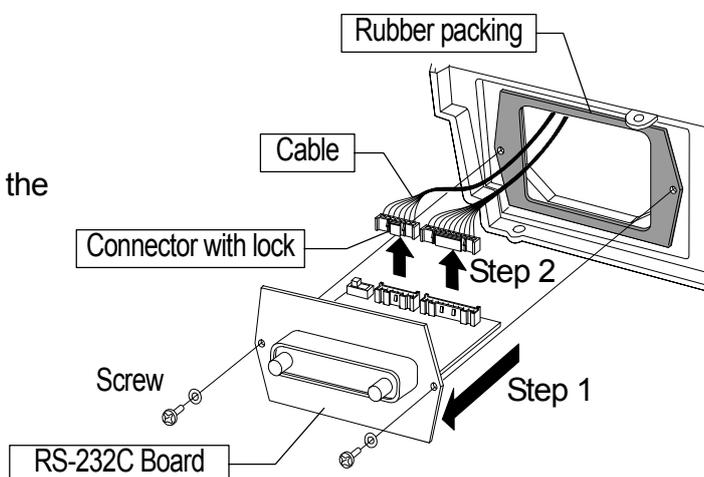
Concerning the RS-232C, the balance has two functions: "Data output (*dout*)" and "Serial interface (S, F)". Set each function as necessary.

## 6. Analog Output (GX-06K)

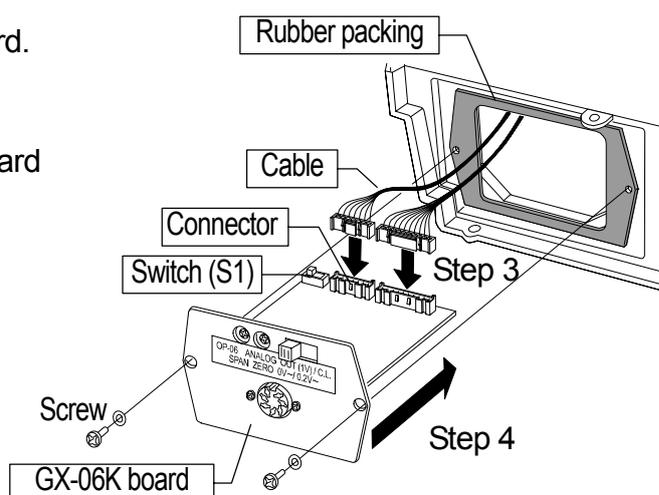
### 6-1. Installing The GX-06K

Install the GX-06K option in the following procedures:

1. Remove two screws.  
Remove the standard RS-232C board.
2. Unlock and remove two connectors from the standard RS-232C board.  
Do not pull the cable.



3. Connect two connectors to the GX-06K board.
4. Put the rubber packing between GX-06K board and the balance.  
Insert the GX-06K board into the balance.  
Fasten the GX-06K board with two screws.



#### Note

- Confirm right surface and direction of the option board, when the option is inserted.
- The position of the switch (S1) is free.
- The balance side of the rubber packing is the surface that there are gaps and ridges.

## 6-2. Analog Output (GX-06K) Specifications

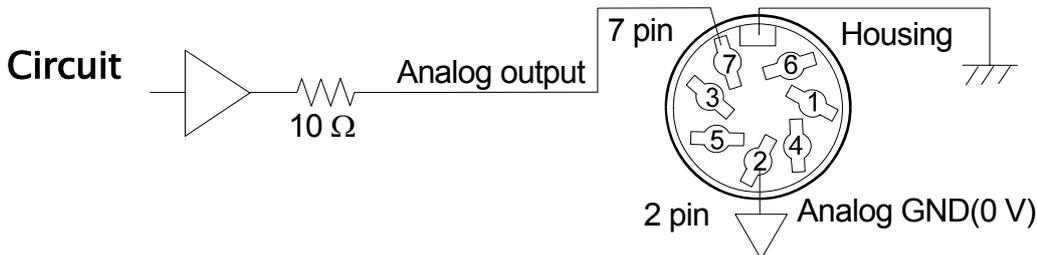
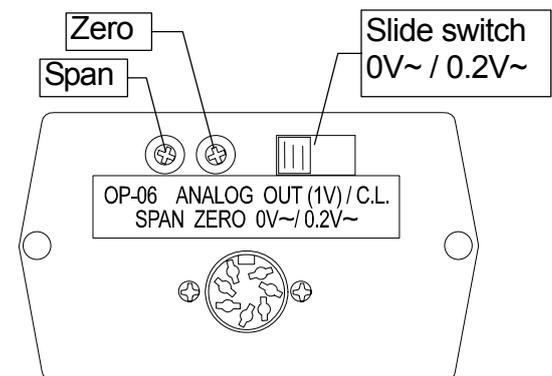
The specifications of the analog output unit (GX-06K) are as follows:

Output impedance	100 $\Omega$ or less
Linearity	$\pm 0.3\%$ or less
Output connector	7-pin DIN connector
Pin connections	Output Pin 7 GND Pin 2
Output range	0 V to 1 V (With the slide switch set to "0V~") 0.2 V to 1 V (With the slide switch set to "0.2V~")
Input impedance of the device connected	10 k $\Omega$ or greater

### Pin Assignments

Pin No.	Description
1	No connection
2	<b>Analog GND(0 V) (Analog output)</b>
3	Sending loop (Current loop)
4	No connection
5	Sending loop (Current loop)
6	No connection
7	<b>Analog output (Analog output)</b>
Housing	Shield

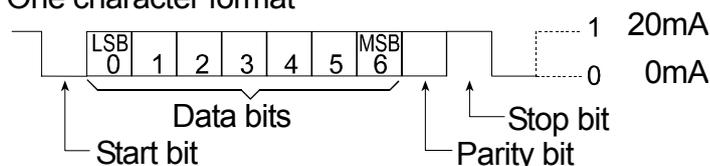
### Panel View



### Current loop output specifications

For details on the current loop, Refer to "5-2.Current Loop Output (GX-04K/GX-06K) Specifications".

Transmission system	20 mA current loop (Passive)
Transmission	Asynchronous, uni-directional (Only from the balance)
Data format	Baud rate: 600, 1200, 2400, 4800, 9600 19200 bps
	Data: 7 or 8 bits
	Parity: Even, Odd (Data 7 bits) None (Data 8 bits)
	Stop bit: 1 bit or 2 bits
	Code: ASCII
	One character format



### Notes

To use the current loop, an external power supply that provides 20 mA is required.

The maximum rated voltage of the current loop is 25 V.

When a baud rate of 4800 bps or higher is used, communication may not be performed properly.

## 6-3. Function Table Of The Analog Output

The “Analog output ( $R_{out}$ )” of the function table can be selected when the GX-06K option is installed in the balance.

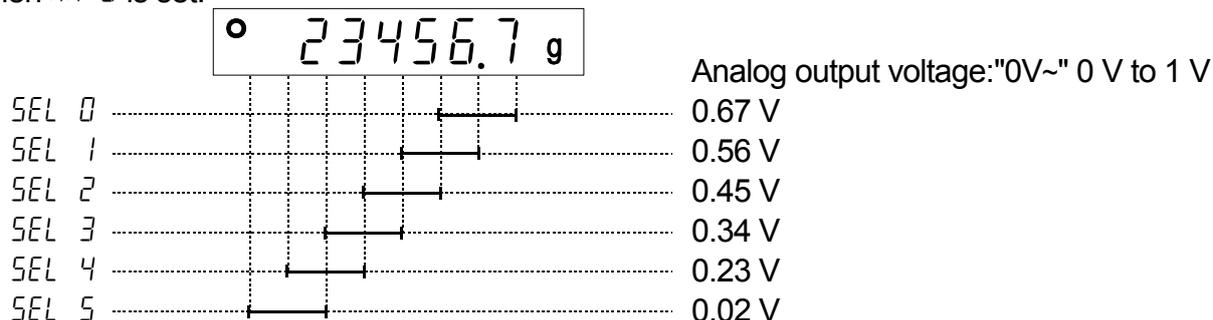
### Analog output function table

Item and Parameter		Description
$R_n$ Analog output mode	0	2-digit output Converts the consecutive 2 digits, with the digit selected in $SEL$ as the least, to voltage and outputs.
	1	3-digit output Converts the consecutive 3 digits, with the digit selected in $SEL$ as the least, to voltage and outputs.
	2	Net full scale output Outputs 0.000 V when the net weight is zero. Outputs 1.000 V when the net weight is full scale. Outputs 0.000 V when the display is set to zero using the <span style="border: 1px solid black; padding: 2px;">RE-ZERO</span> key.
	3	Gross full scale output Outputs 0.000 V when the gross weight is zero. Outputs 1.000 V when the gross weight is full scale. Tare operation using the <span style="border: 1px solid black; padding: 2px;">RE-ZERO</span> key will not affect the output. (Note: If the tare is extremely light, tare operation might change the zero point, thus it will affect the output.)
$SEL$ Output digit selection		Select the least digit to be output in the mode selected in $R_n$ . Only available when 0 or 1 is selected as the output mode.
	0	Select the first digit as the least.
	1	Select the second digit as the least.
	2	Select the third digit as the least.
	3	Select the fourth digit as the least.
	4	Select the fifth digit as the least.
5	Select the sixth digit as the least.	

▪ : Factory settings. Digit is a unit of minimum weighing value.

## Example

When  $R_n 0$  is set:

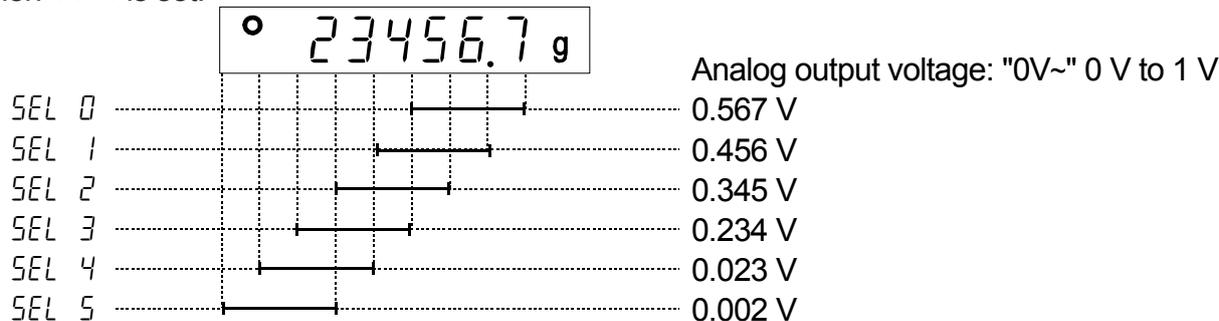


## Notes

The invisible high-order digits are regarded as zero.

The invisible least digit is regarded as zero (when the minimum weighing value is turned off using the **SAMPEL** key).

When  $R_n 1$  is set:



When  $R_n 2$  or  $R_n 3$  is set:

Model				Full scale
GX-8K	GX-8K2	GF-8K	GF-8K2	8kg
GX-10K	GF-10K			10kg
GX-12K	GF-12K			12kg
GX-20K	GF-20K			20kg
GX-30K	GX-32K	GF-30K	GF-32K	30kg

For example, when the GX-20K displays 2 kg, the output voltage of  $R_n 2$  is 0.1 V (when the slide switch is set to "0V~").

$$1.000\text{V} \times \frac{2\text{kg}}{20\text{kg}} = 0.100\text{V}$$

## Note

"Full scale" of the full scale output mode indicates the full scale values shown in the table above. The output voltage may exceed 1.000 V, depending on the weighing data.

For example, when the GX-20K displays 21 kg, the output voltage is 1.05 V.

$$1.000\text{V} \times \frac{21\text{kg}}{20\text{kg}} = 1.05\text{V}$$

## 6-4. Switching Output Voltage

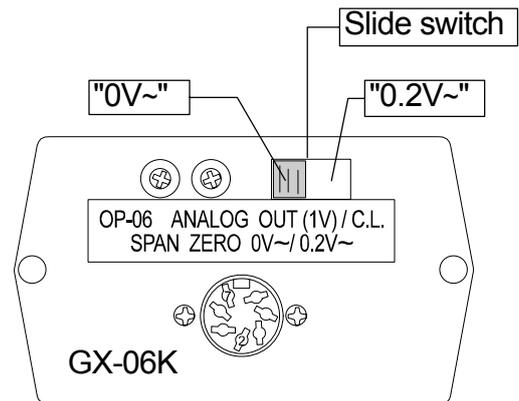
The output voltage can be switched using the slide switch on the GX-06K panel. "0V~" has been set at factory before shipment.

"0V~" (0V to 1 V):

At zero    0.000 V            At full scale    1.000 V

"0.2V~" (0.2 V to 1 V):

At zero    0.200 V            At full scale    1.000 V



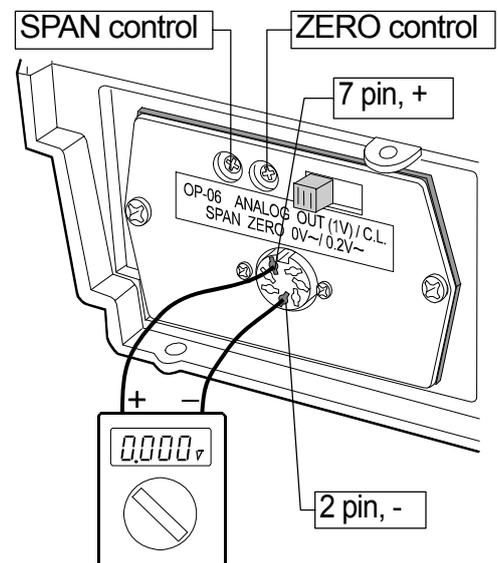
## 6-5. Output Voltage Fine Adjustment

The output voltage has been adjusted at the factory before shipment.

Using the ZERO and SPAN fine-adjustment control and a voltmeter, the output voltage can be fine adjusted.

### Fine-adjustment procedure

1. Turn the display off, using the **ON:OFF** key. At this time, the output voltage will be at zero. Turn the ZERO control so that the voltmeter indicates 0.000 V when the slide switch is set to "0V~"; 0.200 V when the slide switch is set to "0.2V~".
2. While pressing and holding the **SAMPLE** and **PRINT** keys, press the **ON:OFF** key. The balance displays **P5**. At this time, a voltage of 1 V is generated. Turn the SPAN control so that the voltmeter indicates 1.000 V.
3. Repeat steps 1 and 2 until the correct output voltage is obtained.



Display for setting the output to 0 V (0.2 V)



Display for setting the output to 1 V



## 6-6. Fixed Output Voltage

The output voltage is fixed under the following conditions:

1. During operations other than weighing : 0 V (or 0.2 V)  
Example: the display-off state, calibration
2. During the zeroing operation /  $R_n \exists$  : The previous output value is retained.  
 $R_n 0, R_n 1$  and  $R_n 2$  : 0 V (or 0.2 V when the slide switch set to "0.2V~")
3. When "-E" (Weighing pan error) is being displayed : 0 V (or 0.2 V when the slide switch set to "0.2V~")
4. When "E" (Overload error) is being displayed : Output voltage is as shown below.  
(when the slide switch is set to "0V~")

Model				$R_n 2, R_n 3$
GX-8K	GX-8K2	GF-8K	GF-8K2	1.013V
GX-10K	GF-10K			1.010V
GX-12K	GF-12K			1.000V
GX-20K	GF-20K			1.050V
GX-30K	GX-32K	GF-30K	GF-32K	1.033V







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