Magnescale
SPEED X PRECISION

LY72

Initial Setup Manual

LY72

INITIAL SETUP FLOW

START ⟫ Advance Preparation ⟫ Basic Settings ⟫ Advanced Settings ⟫ Finished

Check the conditions of use

STEP **1~3**

STEP **4~5**

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Preparations before making the initial setting (1/3)

By confirming the conditions of use in advance, the setting operation can be performed easily.
Let's start with the basic settings.

Basic Setting Items

Pay attention to the functions that can be used depending on the selection of the axis label.
*The following functions cannot be selected when the XYZ label is selected.
・Master calibration function
・Peak value (maximum, minimum, P-P value) calculation function
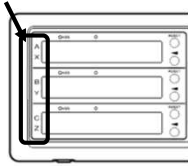・Timer output via RS-232C communication

Items	Indication (default)	Description	Setting
Axis label `LAbEL`		Select the axis label to be used for the counter display and RS232C command. The functions that can be used differ depending on the selected axis label. ABC display: Function for gauge type measuring unit XYZ display: Functions for scale type measuring unit	Axis label: ABC or XYZ
Master calibration `nASTEr` **NOTE**: Invalid when XYZ label is selected	`OFF`	When the power is turned on, the system automatically waits for the reference point detection and automatically reproduces the reference position of the master block. It is necessary to adjust the reference position of the master block once before the power is turned on.	OFF: Useless ON: Effective:
Input axis `SIG IN`	`1 2 3`	Select how to display the number of scale axes to be connected. When you select "Additive Display", select the polarity (+/-) of each axis as well.	1: Single axis only 1 2: 2-axes independent display 1 2 3: 3-axes independent display
Destination country `COUNTrY`	`STd`	Please select the region to be used.	STD: General Area `mm, inch` US: U.S.A. `mm, inch` JPN: Japan `mm`
Measuring unit resolution `SIG rES`	`0.5 u`	Set the resolution output from the measurement unit to be used for each axis. The resolutions that can be selected are length and angle. Expanded selections increase the number of options. *Angular resolution (1sec to 1 degree) when using a rotary scale	Length: 0.05 to 100µm *See Tables 1,2 and 3 or Angle: 1 second to 1 degree

Table1: Length scale output resolution

Measuring Unit	Output resolution	connection cable	Adapter *
SR-1711 SR-1711R	0.5µm	HK-**C HK-**CR	SZ05-T01
SR801/ MSS-101 SR801R	0.5µm	HK-1**C HK-2**C	SZ05-T01
SR801/ MSS-101 SR801R	0.5µm	CE07-**C	SZ51-MS01 + SZ70-1
SR10 / SR30 / SR50 SR50-R	0.5µm	HK-4**C HK6-**CR	SZ05-T01
SR118	0.5µm	CE05-**C CH02-**	DZ51 + SZ70-1
SR108 SR107	0.5µm		SZ51-MS01 + SZ70-1
SR128	0.5µm	CH01-**C	SZ70-1
SR128 / SR127	0.5µm	CH01-LW**C	SZ51-MS01 + SZ70-1
SR138R(GB-ER)	0.5µm	CH04-03C	

Table 2: Digiruler output resolution

Measuring Unit	Output resolution	Adapter/ conversion cable	Adapter *
SL110 SL130	10µm	PL20B	SZ70-1
SL110 SL130	10µm	PL20C	
SJ300	1µm	CH33-**CPD/CED	
SJ700	5µm		SZ70-1
SJ700A	5µm		

Table3: Digital gage output resolution
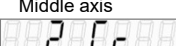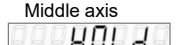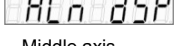
Measuring Unit	Output resolution	Adapter/ conversion cable	Adapter *
DG	0.5µm		SZ05-T01
DG-B	0.5µm	DZ-51	SZ70-1
DL310B/330B	10µm	DZ-51	SZ70-1
DK series	0.1µm or 0.5µm	CE29-**	

* For adapter information, refer to Appendix 2 Adapter Connection in this Manual

Preparations before making the initial setting (2/3)

Check the usage conditions for Advanced Settings.

Advanced Setting Items

Items	Indication (default)	Description	Setting
Display at Power-ON `Pon dSP`	`LY`	Select the display when the power is turned on If you select "LY", "LY" will be displayed and recognized when the power is cut off.	COU n T: count display LY: "LY" display (default)
Display resolution and polarity `dSP rES`	`0.5 u`	Set the resolution of each display axis You cannot set a value smaller than the input resolution. Also select the polarity (+/-). * The initial value is the measurement unit resolution set in the basic settings.	Length: 0.05 to 100µm or Angle: 1 second to 1 degree

Display axis and display data
`INPUT`
`CHANGE`
	Upper axis `1 Cr`
	Middle axis `2 Cr`
	Lower axis `3 Cr`
		Set the display contents when the power of each display axis is turned on
		
		Set axis input axis number and display data
		
		* At the time of shipment, the current values are displayed for all three axes.
		* When the XYZ label is selected, display selection other than the current value is not possible.
			Input axis number:
			  1, 2, 3
			Display data:
			  Present value
			  Maximum value
			  Minimum value
			  P-P value
			  Do not show

Scaling `SCALING`	`1.000000`	Displayed by multiplying the measured value by a magnification	0.1 times to about 10 times
Linear compensation `LIN Err`	`0.0000`	Set a linear compensation value for the length per 1 m	±600µm/m *Expanded selections ±1000µm/m
Hole function `HOLd Fn`	`LATCH`	Function selection during hold operation (operation key, external input)	LATCH: Latch function PAUSE: Pause function
General-purpose input `INPUT` **NOTE:** Invalid when XYZ label is selected	Upper axis `HOLd` Middle axis `HOLd` Lower axis `HOLd`	Function selection of general-purpose input (1 circuit each) for 3 display axes - Hold: Holds the display (holds on the first input and cancels on the second input) Furthermore, holds the update of the peak calculation when the ABC label and pause function are selected. - Restart: Recalculate the maximum / minimum value - Display switching: Switching between the current value and the selected display (maximum value, minimum value, peak value) - Origin load: Reproduction of reference position - Recall: Recall preset values	Hold Restart.(When ABC label is selected) Display switching(When ABC label is selected) Reference point Load Recall (preset value)
General-purpose output `OUTPUT`	Upper axis `ALn dSP` Middle axis `ALn dSP` Lower axis `ALn dSP`	Function selection of general-purpose output (1 circuit each) for 3 display axes - Alarm: Output when Error is displayed - Display mode: Current value or peak value - Origin passing signal: Output when the origin is passed during origin operation - Origin alarm: Output when the origin signal is not connected and the origin speed is exceeded.	Alarm (default) Display mode (When ABC label is selected) Reference point passage signal Reference point alarm
Key lock `KEYLOCK`	`OFF`	Function to prevent erroneous operation of Key operation After setting, only a specific key can be used. A password (1793) is required to unlock it.	OFF: No key lock ON: Key lock
Current value store `STr`	`OFF`	Select whether to display the previous value when the power is turned on * If you use the master alignment function in the basic settings, it will not work even if it is turned on.	OFF: Don't save the current value ON: Save the current value
Flicker control `FLICKEr`	`2`	Prevents flickering of the smallest digit to be displayed Set the stage to suppress flicker.	OFF: Function stop 1: Weak 2: Strong
Sleep `SLEEP`	`OFF`	The display turns off when there is no movement of the length measurement unit or key operation for a certain period of time while the power is on. It will return when the length measurement unit is moved or the Key operation is performed again.	OFF: Do not put to sleep 1: 1 minute later 5: 5 minutes later 10:10 minutes later 30:30 minutes later 60:60 minutes later

Preparations before making the initial setting (3/3)

Check the advanced settings for RS232C communication.

Advanced Setting Items

Items	Indication (default)	Description	Setting
RS232C Output data mode `nOdE`	`COnP`	Set the output data mode when receiving the data request command ("R"). Outputs data for 3 axes in computer mode, and outputs data for 1 axis in print mode.	- COMP: Computer mode (default) ABC axis output or XYZ axis output - Print : Print mode Output only A axis (when ABC label is selected) or Output only X axis (when XYZ label is selected)
RS232C Output data format `FOrn` **Invalid when print mode is selected**	When ABC is selected `AbC` When XYZ is selected `h2443`	Select the output data format. ・All lines output in one line ・Line feed and output ・Add a header The selectable items differ depending on the axis label (ABC or XYZ)	When ABC label is selected: (default) AbC : Outputs one line for all axes without header A.b.C. : New line output for each axis without header h1AbC : Header 1 outputs one line for all axes h1A.b.C : Header 1 outputs line feed for each axis When XYZ label is selected: XYZ : Output with 1 line for all axes without header X.Y.Z. : New line output for each axis without header h1XYZ : Header 1 outputs 1 line for all axes h1X.Y.Z.: New line output for each axis with header 1 h2XYZ : Header 2 outputs one line for all axes (default) h2X.Y.Z.: Line feed output for each axis with header 2
RS232C Output data selection `r dATA` **Invalid when XYZ label is selected**	`Cr`	Set the output data when receiving the data request command ("R"). ・Present value ・Maximum value ・minimum value ・P-P value	When ABC label is selected: Cr : Current value MAX: Maximum value MIN : Minimum value P-P : P-P value *Cannot be set when XYZ axes are selected.
RS232C timer `TInEr` **Invalid when XYZ label is selected**	`OFF`	The data specified by the "R" command can be output at fixed intervals.	Setting range: None 0.2, 0.5, 1, 5, 10, 30, 60, 300 (sec.) *Cannot be set when XYZ axes are selected.
RS232C transfer rate `bPS`	`9600`	Set the transfer rate of RS232C	Setting range: 1200, 2400, 4800, 9600, 19200, 36400 (bps)
RS232C parity `PAr1TY`	`NON`	Set RS232C parity	Setting: none Odd number Even number
RS232C Stop bit `STOP`	`1-STOP`	Set the stop bit of RS232C	Setting: 1bit 2bit
RS232C data length `LENGTH`	`8-b1T`	Set the data length of RS232C	Setting: 8bit 7bit

How to set up Basic Settings (1/3)

Step 1 Configure the basic settings.

Choose one of the following methods of operation.

NOTE: If you change the basic settings, Detailed Settings will be reset to the factory defaults.

When the power is turned on for the first time after shipment from the factory

Connect the AC adapter and turn the primary power "on".

When you want to change the basic settings

AC adapter is energized.

Turn on ⏻ key, the LED light changes from "blinking" to "off" and then press

and hold 🔘 SET UP key for 3 seconds.

The following display appears

Connecting the AC Adapter

AC primary power source

◀ Axis selection Key

SET UP — SET-UP key

🔘⬆ — Item feed Key

⏻ Standby key light

Ten keys
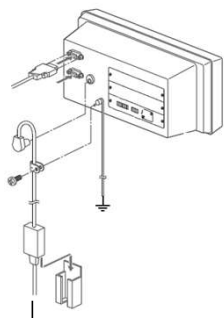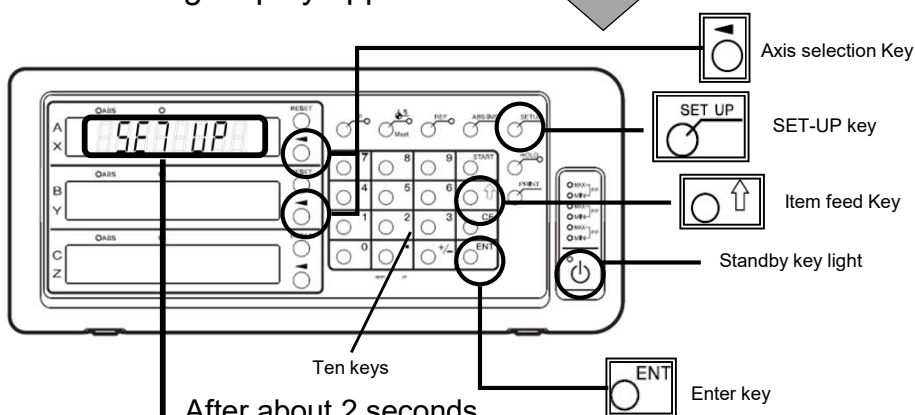
After about 2 seconds
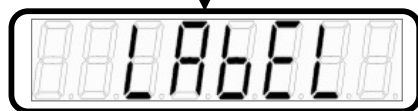
LAbEL

"Axis label selection" setting display

ENT — Enter key

Continued on next page

LAbEL

Axis LABEL

Pressing 🔘⬆ key changes the basic setting mode in the order in which it is set.

LABEL:
Select the axis label according to the intended use.
(ABC or XYZ) (**NOTE**)

Cannot be set when XYZ label is selected

MASTEr	**SIG IN**	**COUNTry**	**SIG rES**
MASTER — Master calibration	SIG IN — Input axis	COUNTRY — Destination	SIG RES — Measuring unit resolution

MASTER (Master calibration function):
Select whether to start with the master block or other dimensions every time the power is turned on.

SIG IN (input axis):
Set the 1-axis, 2-axis, and 3-axis (Setting the number of display axes)
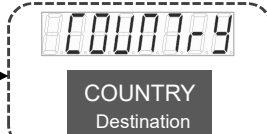
COUNTRY (destination country):
Please select your region

Signal resolution (measuring unit resolution):
Sets the output resolution of the scale to be connected. Supports the input of length and angle display units.

NOTE: Selection of axis label

ABC display: Function for digital gauge type measuring unit

XYZ display: Function for length scale type measuring unit

The functions that can be used vary depending on the axis label selection.

COUNTRY (Destination)

Symbol		Destination	Unit
STD	STd	General area	mm, inch
US	US	U.S.A.	mm, inch
JPN	JPN	Japan	mm

How to set up Basic Settings (2/3)

Step 2 Enter the settings confirmed in "Preparations before making initial settings (1/3)".
Repeat steps (1), (2), and (3) to make the basic settings.

(1) Use [○⇧] key to change the basic setting item.

(2) The setting selection can be switched with [○◁] key on the right side of the counter display.

(3) To define the new value, press [○ENT] key.

Basic Settings

default — ABC or XYZ

LAbEL
Axis LABEL

Switch with [○◁] key
[○ENT] key to confirm the axis label

Cannot be set when XYZ label is selected

MASTEr	**SIG IN**	**COUNTry**	**SIG rES**
MASTER Master calibration	SIG IN Input axis	COUNTRY Destination	SIG RES Measuring unit resolution

MASTER branch:

default
OFF — Do not use the master calibration
On — Use the master calibration

SIG IN branch:

default
1 2 3 — Use the 1st to 3rd axes
1 — Use the 1st axis only
1 2 — Use the 1st and 2nd axes

COUNTRY branch:

default
STd (mm, inch) — STANDARD (General area)
US (mm, inch) — U.S.A.
JPN (mm) — JAPAN

SIG RES branch:

default
05 u — 0.5µm
01 u — 0.1µm
00 1000 — 10 minutes
000 100 — 1 minute
0000 10 — 10 seconds
000001 — 1 second
10 u — 10µm
5 u — 5µm
1 u — 1µm

How to view extended settings:
For extended settings, press SART-key [○START] when the input resolution of each axis is displayed.

005 u — 0.05µm
2 u — 2µm
20 u — 20µm
25 u — 25µm
50 u — 50µm
100 u — 100µm
0 10000 — 1 degree

Φ lamp
ABS lamp
Axis label lamp

Operation:
- The current setting is displayed after about one second. If there is no change in the setting, the next item is displayed with [○⇧] key.
- The ABS lamp blinks while the parameter is selected with the axis selection key..

How to set up Basic Settings (3/3)

Step 3   Once you have completed the basic settings, exit this mode and move to the advanced setting mode.

How to Exit Basic Setting Mode

① Press ⟦RESET⟧ key or ⟦SET UP⟧ key.

② The display changes to ⟦CANCEL⟧ (CANCEL).

③ Pressing ⟦◂⟧ (key displays ⟦FINISH⟧ (FINISH).

④ Press ⟦ENT⟧ key.

If this is the first time you have made basic settings after shipping, the display will be ⟦Pon dSP⟧

After the second time, the screen is displayed when the power is turned on.

⑤ Press ⟦RESET⟧ key. The display returns to normal.

This completes the basic settings.

Key to be used at the end of the basic setting mode (LY72)
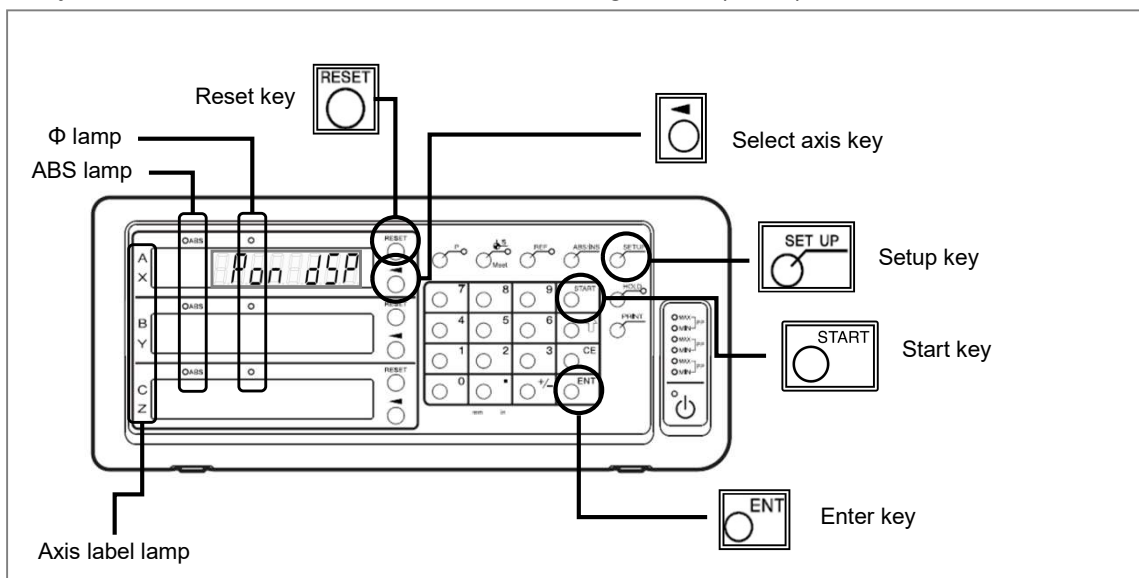
Step 4   Make the advanced settings.

*If you have already completed the basic settings and want to reconfigure only the advanced settings, you can do the same.

Basic Settings

SET UP — Press the setup key in the normal count display state.

Operation:
- The current setting is displayed after about one second. If there is no change in the setting, the next item is displayed with [○↑] key.
- The ABS lamp blinks while the parameter is selected with the axis selection key..

Axis label lamp — Pon dSP

Power On Display
Display at power-on

Pon dSP

The display at power-on can be set.

COUNT → LY

Counting Display   "LY" display (default)

* If you select the count display, you cannot make basic settings.

Display resolution

dSP rES

Length display (NOTE 1)
Diameter display (NOTE 2)

```
0.1 u
0.5 u
  1 u
  5 u
 10 u
```

Extended selection by [START]

```
100 u
 50 u
 25 u
 20 u
  2 u
005 u
0.10000
```

Angle display (NOTE 3)

```
00.1000
000.100
0000.10
000001
```

Φ lamp (NOTE 4)

Press [○] keys for each axis to set the display resolution for each axis.

After setting, use [ENT] key to set the resolution for each axis.
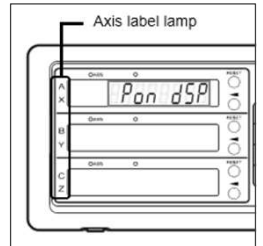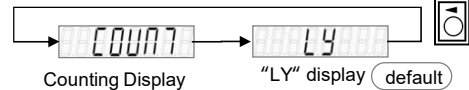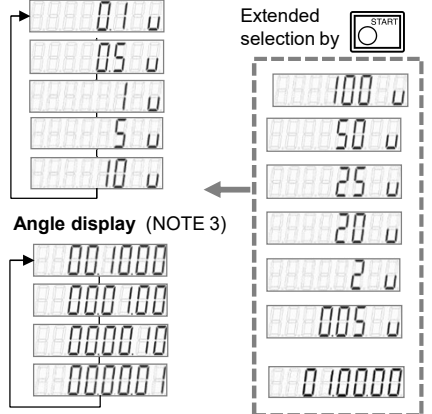
Change polarity with [○ +/-] key

NOTE 1: Selection of a value smaller than the input resolution of the basic setting is not displayed.

NOTE 2: To display the diameter, turn on the Φ lamp.

NOTE 3: The angle display can be selected when the angular resolution is selected in the basic settings.

INPUT CHANGE
Display axis and display data

INPUT CHANGE

Selection of display format when power is turned on for each display axis (A / B / C)

1. Press [○] key to set to select the axis, then select the input axis, and when confirmed, press [ENT] key to set.
2. Continue to press [○] key to select the display data, and when confirmed, set with [ENT] key

* You need to restart the main unit for the settings to take effect.
* When the XYZ axes are selected, only the current location can be set.

Input axis   Display data

1 P-P

Display data

Cr	Current value of input axis
MAY	Maximum value of input axis
MIN	Minimum value of input axis
P-P	P-P value of input axis
- - -	Turn off the display

Input axis: 1, 2, 3

(default)

Upper axis → *1 Cr*
Middle axis → *2 Cr*
Lower axis → *3 Cr*

SCALING
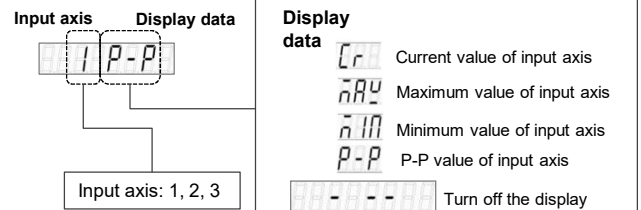
SCALING

1.000000
(default)   1x

Enter scaling factor

Enter numerical values on a numeric keypad.

0.100000 ≤ magnification ≤ *9999999*

Liner Error
(Linear compensation)

LIN Err

0.0000
(default)

Enter a correction value of ±0.600mm per 1m of distance Input up to ±1.0000 mm with expansion selection.

Enter numerical values on a numeric keypad.

Normal: *-0.6000* ~ *0.6000*

[START] Extended selection: *-1.0000* ~ *1.0000*

Advanced Settings

How to set up Advanced Settings (2/3)

Advanced Settings

HOLD Function
Invalid when XYZ label is selected

Hold function selection
LATCH: The display data is fixed without interrupting the internal calculation.
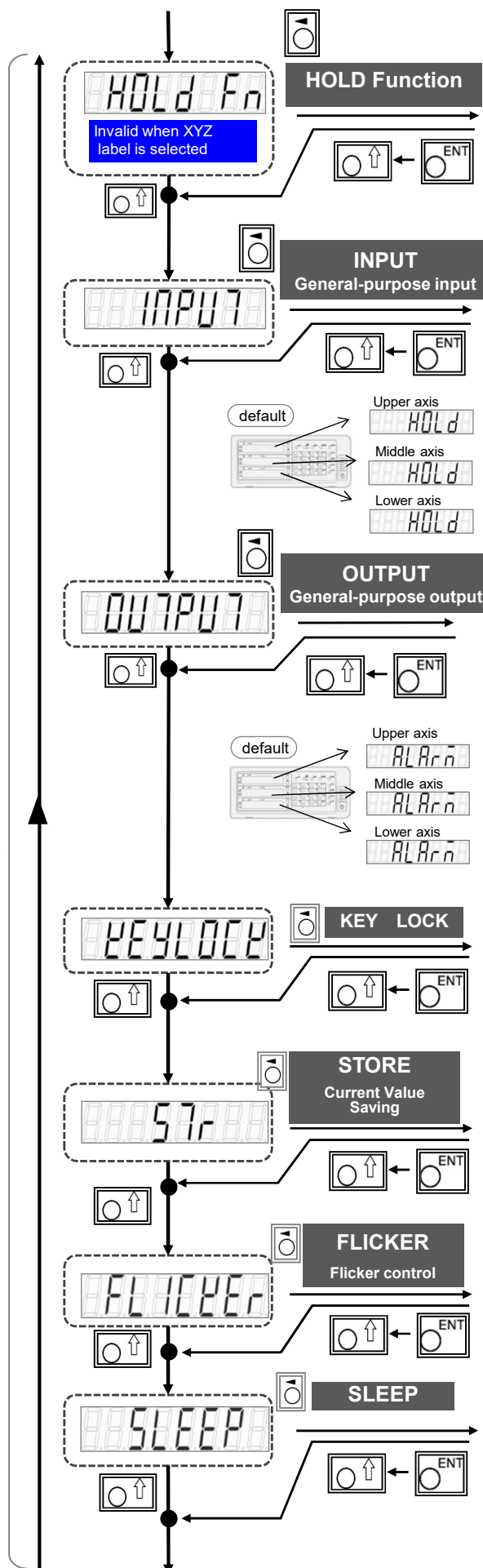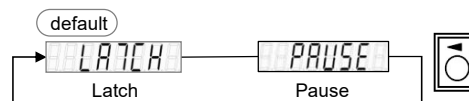PAUSE: Holds peak calculation (temporarily suspends calculation of maximum and minimum values)
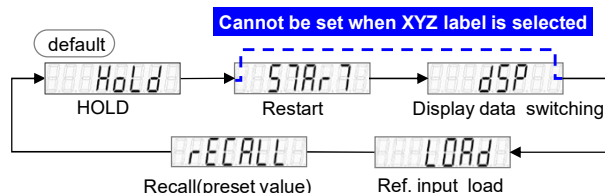
default → `LA7CH` (Latch) → `PAUSE` (Pause)

INPUT
General-purpose input

Function selection of general-purpose input (1 circuit each) for 3 display axes
* Some items may not appear when the axis label XYZ is selected.

key for the axis to change

ENT key to decide the selection

default:
- Upper axis `HOLd`
- Middle axis `HOLd`
- Lower axis `HOLd`

Cannot be set when XYZ label is selected

default → `Hold` (HOLD) → `57Ar7` (Restart) → `dSP` (Display data switching) → `LOAd` (Ref. input load) → `rECALL` (Recall(preset value))
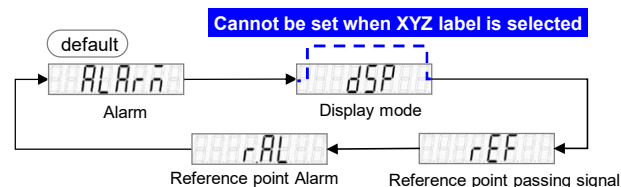
OUTPUT
General-purpose output

Function selection of general-purpose output (1 circuit each) for 3 display axes
* Some items may not appear when the axis label XYZ is selected.
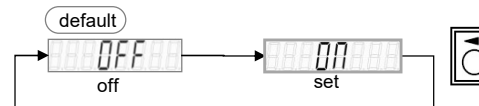
key to change

ENT key to decide the selection

default:
- Upper axis `ALArn`
- Middle axis `ALArn`
- Lower axis `ALArn`

Cannot be set when XYZ label is selected

default → `ALArn` (Alarm) → `dSP` (Display mode) → `rEF` (Reference point passing signal) → `rAL` (Reference point Alarm)

KEY LOCK

Key lock function can be set (to prevent accidental operation)

default → `OFF` (off) → `On` (set)

STORE
Current Value Saving
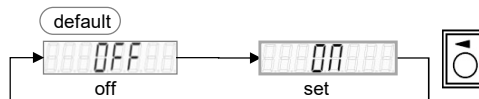
It is possible to save the display at power-off and display the value at power-on.

default → `OFF` (off) → `On` (set)

FLICKER
Flicker control

Flickering of the smallest digits can be suppressed in two stages.

`OFF` (off) → `1` (Inhibition Weak) → default `2` (Inhibition Strong)

SLEEP
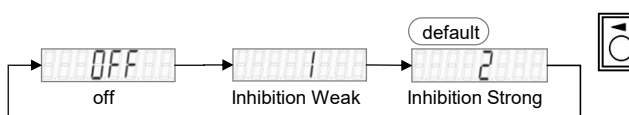
If no operation or scale movement is performed for a certain period of time, the display will turn off.

- none default `OFF`
- 1 min. `1`
- 5 min. `5`
- 10 min. `10`
- 30 min. `30`
- 1h `60`
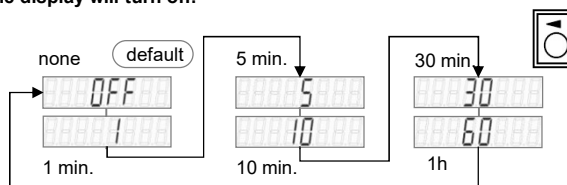
How to set up Advanced Settings (3/3)

RS232C function setting

Advanced Settings

MODE — Output Data mode

FORM — Data output format
Invalid when print mode is selected

r DATA — Output data selection
Invalid when XYZ label is selected

TIMER
Invalid when XYZ label is selected

bPS — transfer speed

Parity

STOP — Stop bit

LENGTH — Data length
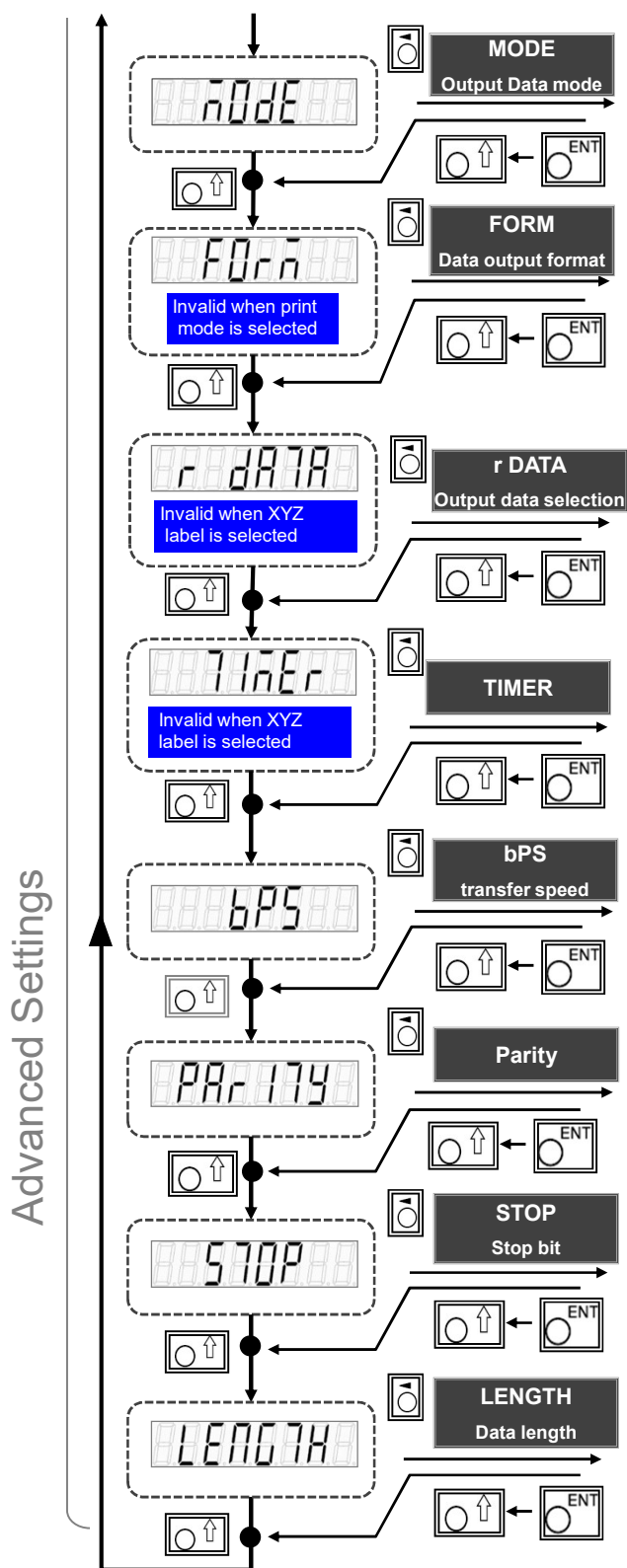
RS232C output data mode selection

default

`COnP` Computer mode → `Prn7` Print mode
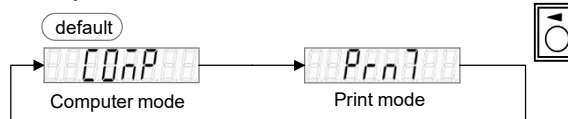
Select the output data format when selecting the computer mode

Select with key to add or not add header

default

`AbC` / `h1AbC`
`AbC` / `h1AbC`

When ABC label is selected

Select whether or not to insert line breaks for each axis with the key

default

`yy:` `h1yy:` `h2yy:`
`yy:` `h1yy:` `h2yy:`

When XYZ label is selected
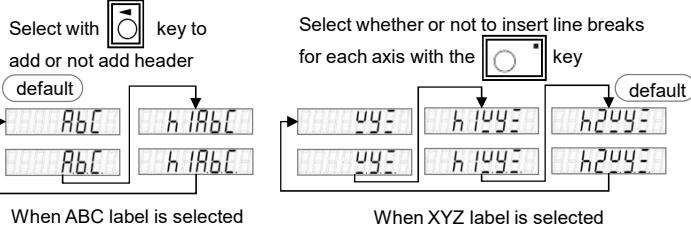
Select default settings for output data
(Output data can be changed by RS232C command)

default

`Cr` current value → `nAY` maximum value → `n1n` minimum value → `P-P` peak to peak value

---
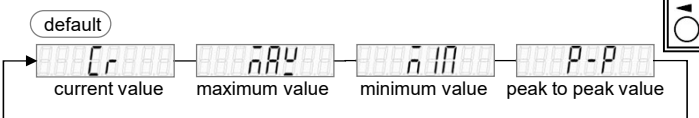
Set automatic data output at fixed time intervals (unit: ms)

default

`OFF` `1` `30`
`02` `5` `60`
`05` `10` `300`
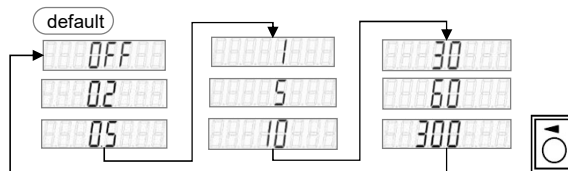
Select the transfer rate of RS232C (unit: bps)

default

`9600` `38400` `2400`
`19200` `1200` `4800`
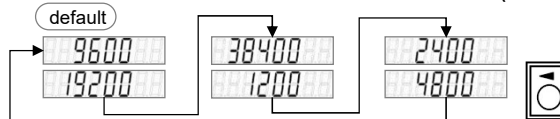
Select RS232C parity check

default

`NON` None `Odd` Odd `EVEN` Even

Select stop bit of RS232C

default

`1-S7OP` 1 stop bit `2-S7OP` 2 stop bit

Select RS232C data length

default

`8-b17` 8 bit `7-b17` 7 bit
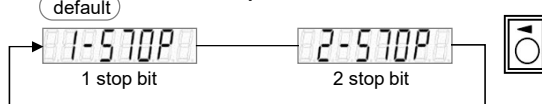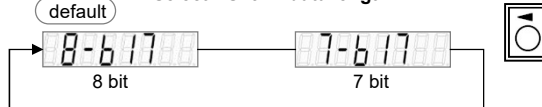
Step 5

When the advanced settings are complete, switch to the normal display.

Press RESET key.

This completes the initial settings.

Factory setting (All clear)

To set the factory settings (all clear), perform the following operations.

Make preparation such as taking notes in advance for necessary items.

Also, do not perform any operation other than the explanation.

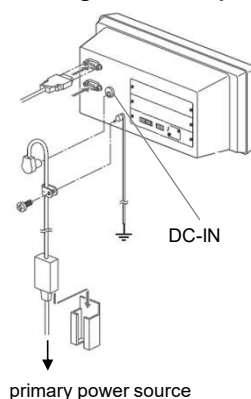**CAUTION: IF YOU DO THIS, ALL SETTINGS WILL BE THE FACTORY DEFAULE SETTINGS.**

Mainly used keys

Connecting the AC Adapter
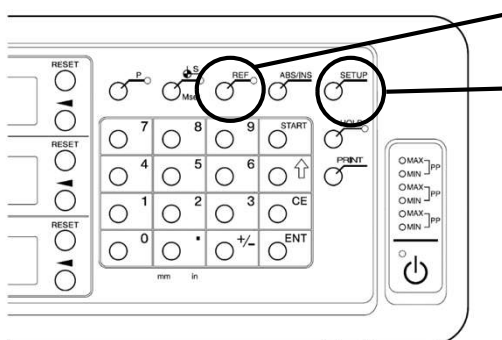
Reference key

Setup key

DC-IN

primary power source

1. Hold down **REF** key and **SET UP** key at the same time to start <u>the power supply</u>.

⇒ The model name of the counter is displayed $LY72$

> Connect the AC adapter to the DC-IN input on the back of the counter and turn on the primary power supply.

2. When you press **REF** key, SLF_TST (slf_tst) is displayed,

   followed by $TST\ SEL$ (Tst Sel)

3. Pressing **REF** key changes the display as shown below.

START → $n.TST$ → $n.TST.$ → $n.TST$ → $n.TST$

→ $STr\ OU$ → $ALL\ CLr$ → $CLr\ OU$ → $TST\ SEL$ → completion
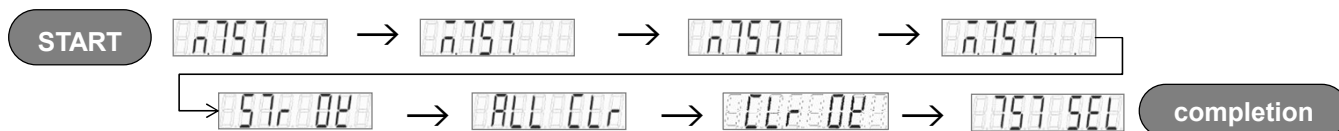
4. Turn off the primary power supply to the AC adapter.

How to check the software version:

Power ON → Display LY → [ ] Key → Version

Press any key to return to the LY display.

Appendix 1

Front panel

LY72

No.	Name	No.	Name	No.	Name
①	Axis label	⑦	P key	⑬	PRINT key
②	ABS lamp	⑧	Datum point value/Master combination value setting key	⑭	Standby key
③	Φ lamp	⑨	REF key	⑮	Numeric key
④	Counter display	⑩	ABS/INC key	⑯	Function key
⑤	RESET key	⑪	SETUP key	⑰	Peak value lamp
⑥	Axis select key	⑫	HOLD key		

Alarm indication

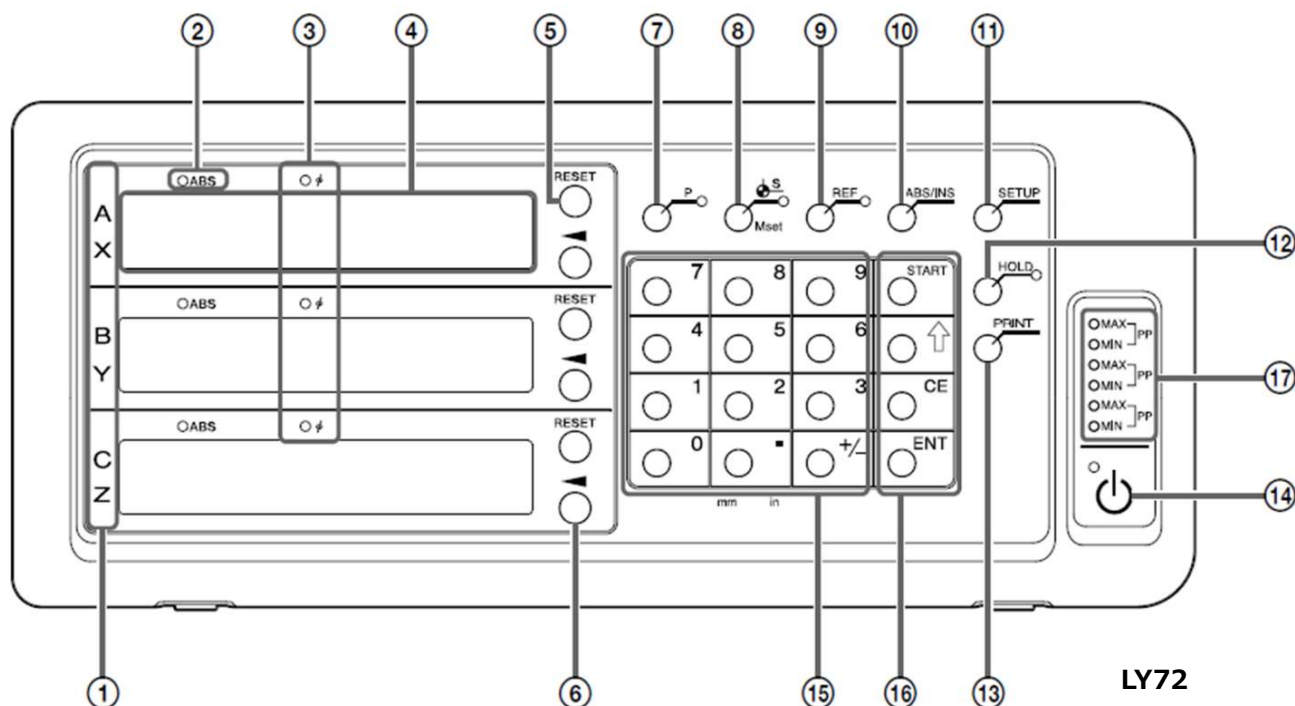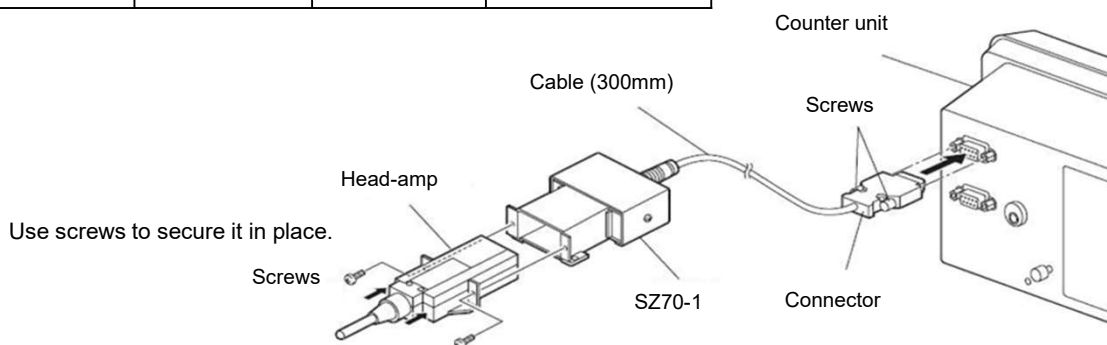| Display	Status	Display	Status
Error	Measurement unit not connected	**LY** (Blinking)	Storage data error
SPd Err	Speed over (NOTE)	**r.Error**	Reference point detection error
F000000	Overflow		
LY (Light)	Power failure		

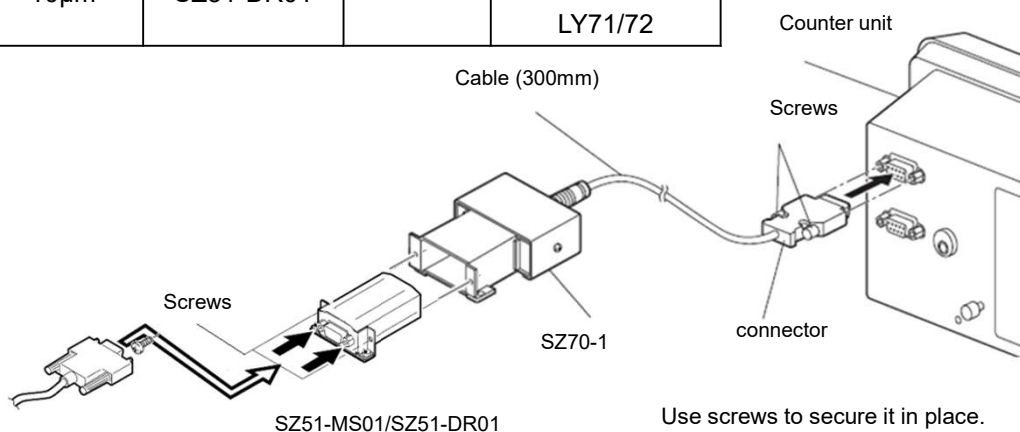**NOTE:** When using an adapter connection (SZ**), no speed override indication is shown, but rather an error message.

Scale/ Head	Resolution	Adapter	Counter
SR128(GB-A)	0.5µm	SZ70-1	LG20
PL20B	10µm		LH70/71/71A/72
SJ700	5µm		LY71/72

Counter unit

Cable (300mm)

Screws

Head-amp

Use screws to secure it in place.

Screws

SZ70-1

Connector

Scale/ Head	Resolution	Adapter 1	Adapter 2	Counter
SR108(GB)	0.5µm	SZ51-MS01	SZ70-1	LG20
PL20A	10µm	SZ51-DR01		LH70/71/71A/72
				LY71/72

Counter unit

Cable (300mm)

Screws

Screws

SZ70-1

connector

SZ51-MS01/SZ51-DR01

Use screws to secure it in place.

Scale	Resolution	Adapter	Counter
SR-1711(GP)、 SR10A/741(GS)、 SR50A(GF,GF-R)、 SR30A(GM)、 SR801/801R(GL)	0.5µm	SZ05-T01	LG20 LH70/71/71A/72 LY71/72

* HA13A, 15A, 23A and 25A are used as head amps

Screws

SZ05-T01

Head-amp

Screws

Connector

Use screws to secure it in place.
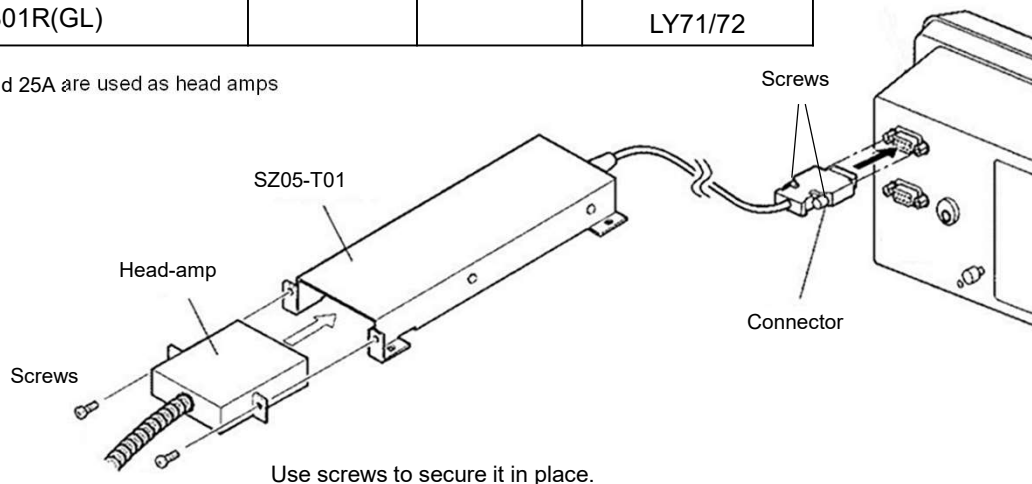
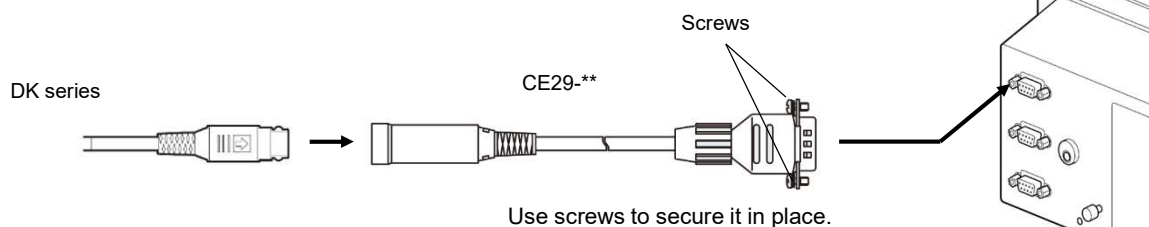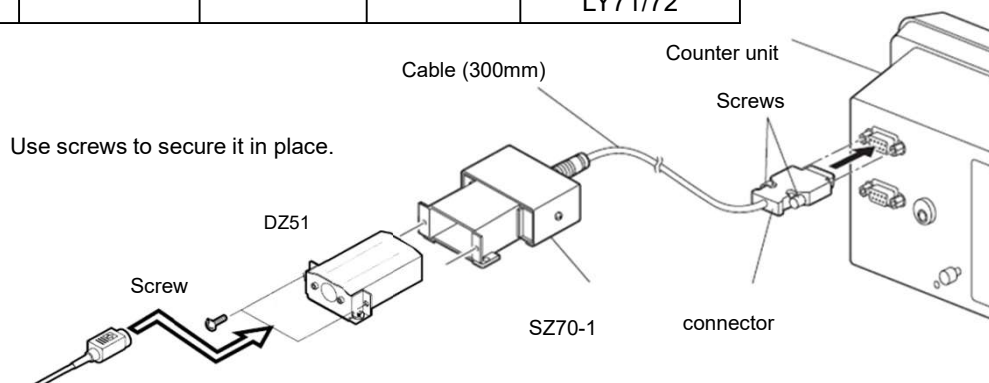# Appendix 2-2

Adapter connection (Digital gauge)

Gauge	Resolution	Connection cable	Counter
DK-**	0.1um or 0.5μm	CE29-** **: 003/01/03/05/10 (0.3 to 10m)	LG20 LH70/71/71A/72 LY71/72

DK series

CE29-**

Screws

Counter unit

Use screws to secure it in place.

Gauge	Resolution	Adapter 1	Adapter 2	Counter
DG-B	0.5μm	DZ51	SZ70-1	LG20
DL310B/330B	10μm			LH70/71/71A/72 LY71/72

Cable (300mm)

Counter unit

Screws

Use screws to secure it in place.

DZ51

Screw

SZ70-1

connector

Gauge	Resolution	Adapter	Counter
DG	0.5μm	SZ05 – T01	LG20 LH70/71/71A/72 LY71/72

Screws

SZ05-T01

Head-amp

Screws

Connector

Use screws to secure it in place.
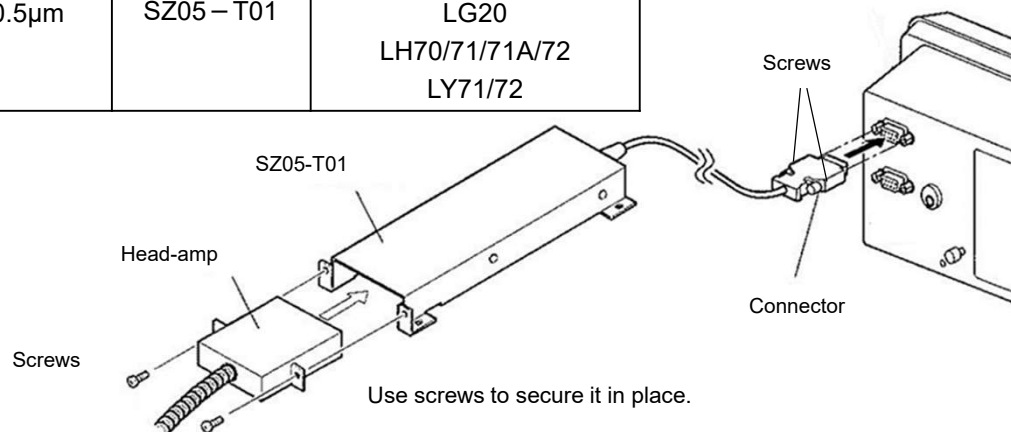
Gauge	Resolution	Adapter	Counter
DE12BR/30BR	0.1μm	SZ70-1	LG20 LH70/71/71A/72 LY71/72

Counter unit

Cable (300mm)

Screws

Head-amp

Use screws to secure it in place.

SZ70-1

Connector