

SONY®

A/B相出力ユニット / A/B Phase Output Unit / A/B-Phasen-Ausgabe-Einheit

LZ51-H

お買い上げいただき、ありがとうございます。

ご使用前に、この取扱説明書を必ずお読みください。

ご使用に際しては、この取扱説明書どおりお使いください。

お読みになった後は、後日お役に立つこともございますので、必ず保管してください。

Read all the instructions in the manual carefully before use and strictly follow them.

Keep the manual for future references.

Lesen Sie die ganze Anleitung vor dem Betrieb aufmerksam durch und folgen Sie beim Betrieb des Geräts den Anweisungen. Bewahren Sie diese Bedienungsanleitung zum späteren Nachlesen griffbereit auf.

取扱説明書 / Instruction Manual / Bedienungsanleitung
第1版 (改訂2) / 1st Edition (Revered 2) / 1.Auflage (Version 2)

[For EU and EFTA countries]

CE Notice

Making by the symbol CE indicates compliance of the EMC directive of the European Community. Such marking is indicative meets or exceeds the following technical standards.

EN 55 011 Group 1 Class A / 91 :

"Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment"

EN 50 082-2 / 95:

"Electromagnetic compatibility - Generic immunity standard Part 2 : Industrial environment"

警告

本装置を機械指令 (EN 60 204-1) の適合を受ける機器にご使用の場合は、その規格に適合するように方策を講じてから、ご使用ください。

Warning

When using this device with equipment governed by Machine Directives EN 60 204-1, measures should be taken to ensure conformance with those directives.

Warnung

Wenn dieses Gerät mit Ausrüstungsteilen verwendet wird, die von den Maschinenrichtlinien EN 60 204-1 geregelt werden, müssen Maßnahmen ergriffen werden, um eine Übereinstimmung mit diesen Normen zu gewährleisten.

[For the customers in U. S. A.]

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

[For the customers in Australia]

Australian EMC Notice

This product complies with the following Australian EMC standards.

AS/NZS 4252.1 /94 EMC Generic Immunity Part1
AS/NZS 2064.1 /91 EMCISM Equipment

CONTENTS

PREPARATIONS

BEFORE OPERATION	24
Precautions	24
1. FEATURES	24
2. NAME AND FUNCTION OF EACH PART	25
3. INSTALLATION AND CONNECTION	
(Before operation)	26
3-1. Installing the Expansion Unit	26
3-2. Connecting the Output Connector	27
3-3. Checking the Initial Settings	29

OPERATIONS

4. FUNCTIONS	32
---------------------------	----

MAINTENANCE

5. TROUBLESHOOTING	36
---------------------------------	----

DATA

6. SPECIFICATIONS	38
7. ACCESSORIES	38
8. DIMENSIONS	39

PREPARATIONS

Be sure to read this section before use.

BEFORE OPERATION

Thank you for purchasing this Sony Precision Technology product.

Read this instruction manual through carefully before use, and keep it properly for future references. In particular, the contents of “3. INSTALLATION AND CONNECTION (Before operation)” are absolutely necessary for ensuring proper operation. Be sure to read this section and make sure the expansion unit is installed correctly before use. This instruction manual mainly explains the differences when the expansion unit is added to the LY51 display unit. For other contents, see the LY51 instruction manual.

Precautions

This expansion unit is designed for use connected with the LY51, and requires the same handling cautions as when the LY51 is used alone.

See the LY51 instruction manual for the various cautions.

1. FEATURES

(1) Easy function expansion

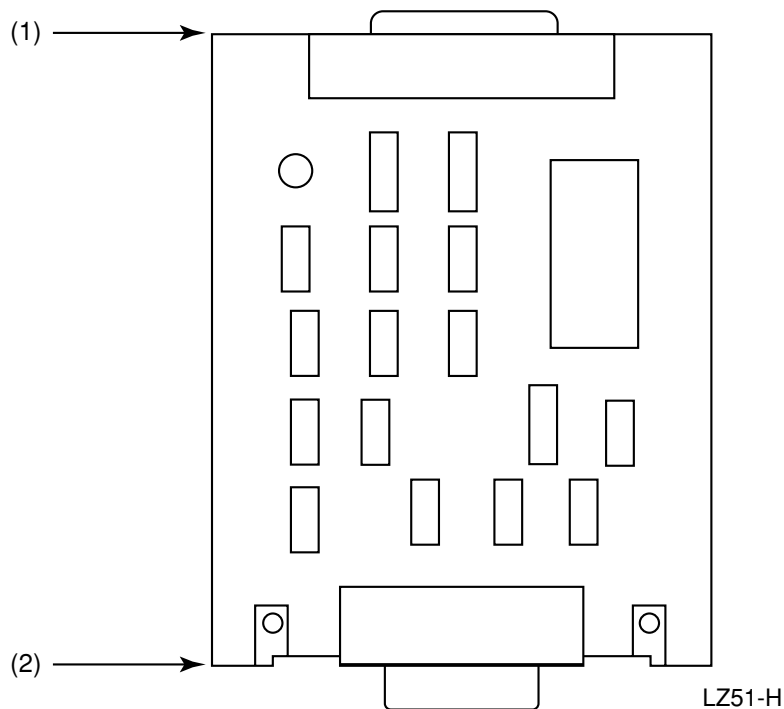
The functions of your current LY51 display unit can be expanded simply by inserting the expansion unit into the LY51.

(2) A/B phase (or up/down) output

The signal for the 1st axis (or 2nd axis) of the input scale can be output as an A/B phase (or up/down) signal.

The output format can be selected from line driver or open collector output.

2. NAME AND FUNCTION OF EACH PART



(1) 60-pin connector
Used to insert the expansion unit into the LY unit body.

(2) Output connector
This outputs the A/B phase (or up/down signal).

3. INSTALLATION AND CONNECTION (Before operation)

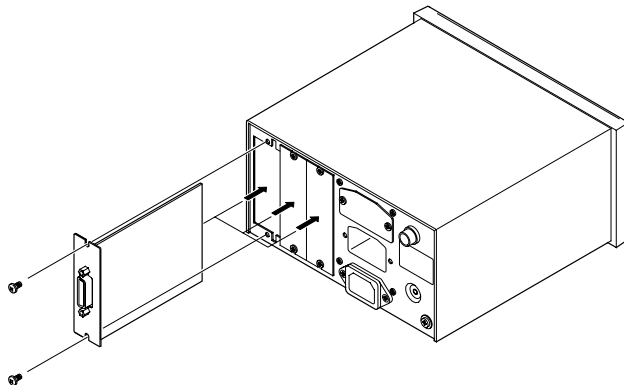
Before operating the expansion unit, please read this section thoroughly for proper use of the unit.

Also, make sure that you install and set the expansion unit correctly in accordance with the installation procedures given in this manual.

3-1. Installing the Expansion Unit	26
3-2. Connecting the Output Connector	27
3-3. Checking the Initial Settings	29

3-1. Installing the Expansion Unit

- (1) Remove the screening cover of the expansion unit slot and insert the expansion unit.
The expansion unit may be installed in any of the three slots.
- (2) Secure the expansion unit firmly in place using the screws which held the screening cover.



3-2. Connecting the Output Connector

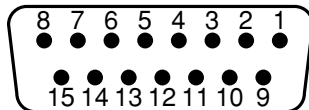
1. Output connector pins

1	A/UP	6	B/DWN	11	1Z
2	$\overline{A/UP}$	7	NC	12	$\overline{1Z}$
3	B/DWN	8	NC	13	1Z
4	$\overline{B/DWN}$	9	2Z	14	2Z
5	A/UP	10	$\overline{2Z}$	15	0V

Pins 1 to 4 and 9 to 12 are line driver outputs.
Pins 5, 6, 13 and 14 are open collector outputs.

Pin assignment: LZ51-H side

The pin assignment as viewed from the rear panel after installation into the display unit is shown below.

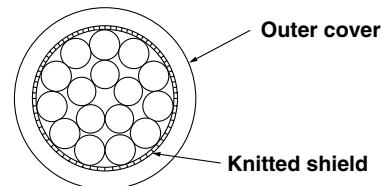


- As described in the following section 3-3.:
 - Select either A/B phase or up/down.
 - Select either the 1st axis or 2nd axis signal.
(Select one or the other. You cannot select both.)
- Both the 1st and 2nd axes are output for Z phase. However, these signals cannot be output when the scale unit does not have a zero point.
(Zero point from the external contact point input using the general-purpose input of the LY51 display unit is not supported.)

2. Interface cables

Use a shielded interface cable as shown in the figure below for connection to the output connector.
Connect the 0 V cable separately from the shielded cable.

Sectional diagram of interface cable

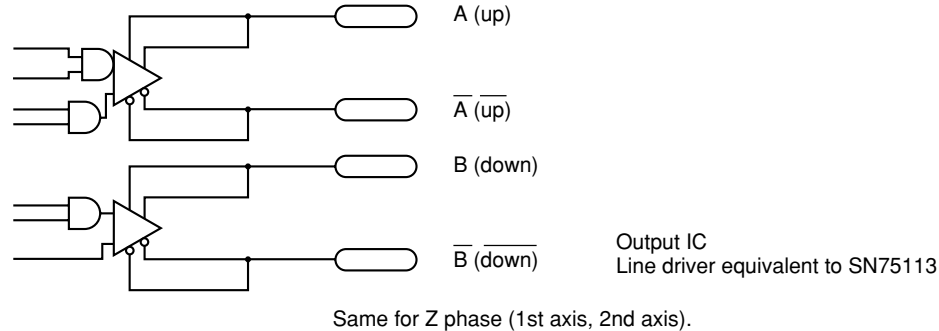


3. Connection circuits

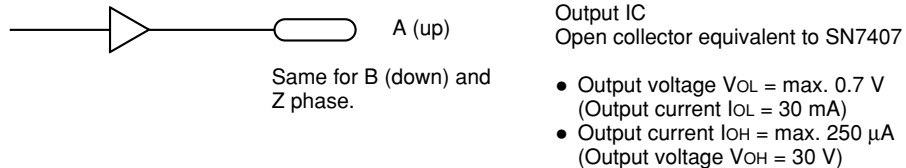
• Output circuit

The outputs are line driver and open collector. Select the necessary signal. You can also select both signals at the same time.

Line driver output: Use a line receiver (SN75115, etc.) to receive the signal.



Open collector output: A pull-up resistor is necessary to receive the signal. The signal is not output if there is no pull-up resistor.



3-3. Checking the Initial Settings

The data output format and other items for the expansion unit are set by the initial settings on the LY51 side.

Setting items

- Select A/B phase or up/down output.
- Select 1st axis or 2nd axis output.

Be sure to check the setting of each item and set the necessary contents before operation. The expansion unit may not operate properly if the settings are not correct.

See the LY51 instruction manual for the initial setting contents.

OPERATIONS

Refer to this section during normal use.

4. FUNCTIONS

The expansion unit can output the scale unit input data for the 1st or 2nd axis as an A/B phase (or up/down signal.)

The output formats are line driver and open collector.

Switching between the 1st and 2nd axes, and between the A/B phase and up/down signals is performed by the LY51 initial settings.

Both the 1st and 2nd axes are output for Z phase.

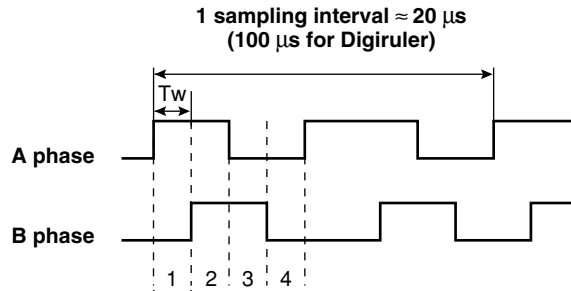
① When A/B phase output is selected

The amount of scale unit movement is detected every approximately $20\ \mu\text{s}$ (every approximately $100\ \mu\text{s}$ for the Digiruler), and A/B phase is output as a pulse corresponding to the scale unit displacement during this interval.

The A/B phase difference corresponds to the scale unit resolution.

The resolution is fixed for each scale unit, and cannot be changed. (The input resolution and display resolution initial settings are for display only, and do not set the output. The A/B phase output resolution is the same as the input resolution.)

B phase advance corresponds to movement in the + direction. (See the previous section for the output signal pin assignment.)



A/B phase difference = 1 count.
(T_w : A/B phase difference = 90°)

1 A/B phase cycle = 4 counts

The A/B phase cycle changes according to the traveling speed of the scale unit.

Select either the 1st or 2nd axis.

(→ 3-3. Checking the Initial Settings (p.29))

The A/B phase output of this display unit is generated artificially. Therefore, the A/B phase difference changes according to the traveling speed of the scale when the traveling speed changes gradually, but when the traveling speed changes drastically within the sampling interval, the pulse may be output at the phase difference for the previous sampling interval.

However, when the DL-B series gauge is connected, the A/B phase signal is output as is from the gauge. (See the DL-B series instruction manual for the phase difference in this case.) The minimum A/B phase difference is as shown in the table below. Note that the pulse may be output with a minimum phase difference of $0.2 \mu\text{s}$ or less when an over-speed alarm occurs.

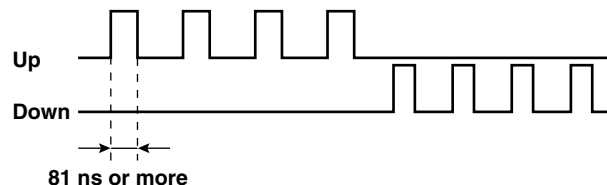
Connected scale unit	Resolution	Response speed	Minimum phase difference
DE gauge	$0.1 \mu\text{m}$	20 m/min	Approx. $0.3 \mu\text{s}$
DG gauge (Magnescale)	$0.5 \mu\text{m}$	60 m/min	Approx. $0.5 \mu\text{s}$
Digiruler	$10 \mu\text{m}$	300 m/min	Approx. $2 \mu\text{s}$

② When up/down output is selected

The amount of scale unit movement is detected every approximately $20 \mu\text{s}$ (every approximately $100 \mu\text{s}$ for the Digiruler), and up/down is output as a pulse corresponding to the scale unit displacement during this interval.

The resolution is fixed for each scale unit, and cannot be changed. (The input resolution and display resolution initial settings are for display only, and do not set the output. The up/down output resolution is the same as the input resolution.)

Up output corresponds to movement in the + direction.



Select either the 1st or 2nd axis.
(→ 3-3. Checking the Initial Settings (p.29))

③ Z phase (zero point) output

Both the 1st and 2nd axes are output for Z phase when either A/B phase or up/down output is selected. However, these signals are not output when the scale unit does not have a zero point.

(Zero point input using the external general-purpose input of the LY51 is not output. In this case, use the external general-purpose output of the LY51 when zero point signal output is necessary. However, note that output is performed by the software so the response time increases.

See the LY51 instruction manual for the LY51 external general-purpose I/O.)

MAINTENANCE

Refer to this section when operation is incorrect.

5. TROUBLESHOOTING

See the LY51 instruction manual for trouble related to the LY51 unit.

This section describes the troubleshooting procedures related to A/B phase (or up/down) output.

**There is no A/B phase
(or up/down) output.**



- When using open collector output, if nothing is connected to the output, no data is output.
A pull-up resistor is necessary to produce the reference voltage on the receiving circuit side.
- Are the output data format and axis settings correct?
Set the correct output data with the LY51 initial settings.
- Is the cable connected correctly? or is the cable broken?
- Is the scale unit connected? If the scale unit signal is not input correctly, no data is output.

**The A/B phase
(or up/down) output
data is incorrect.**



- Are the output data format and axis settings correct?
Set the correct output data with the LY51 initial settings.
- Is the cable connected correctly? or is the cable broken?
- Is the scale unit connected? If the scale unit signal is not input correctly, no data is output.
- To perform the A/B phase (up/down) count properly, both the A-phase (up) and B-phase (down) must be used. The count cannot be performed properly using only one of the phases.

DATA

This section describes the product specifications, dimensions and accessories, etc.

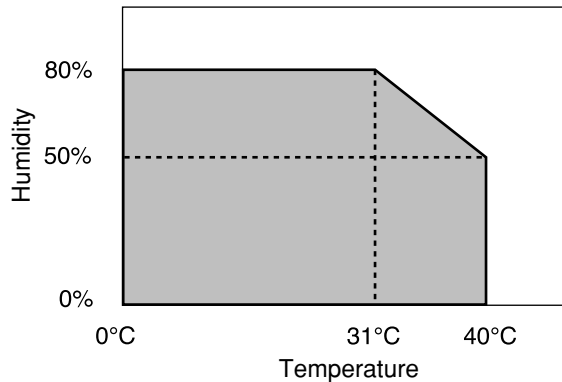
6. SPECIFICATIONS

Item	Contents
A/B phase output	A/B phase output (1st axis, 2nd axis) (Selected with the initial settings, switched with up/down output) Differential 75113 and open collector 7407
Up/down output	Up/down output (1st axis, 2nd axis) (Selected with the initial settings, switched with A/B phase output) Differential 75113 and open collector 7407
Operating temperature/humidity range	0 °C to 40°C (32°F to 104°F) (See the diagram below for the humidity.)
Storage temperature/humidity range	-20 °C to 60 °C (-4°F to 140°F) (20 to 90% RH, no condensation)
Z phase output	Both the 1st and 2nd axes Differential 75113 and open collector 7407

7. ACCESSORIES

Instruction manual	1
15-pin D-sub male connector	1
D-sub hood	1

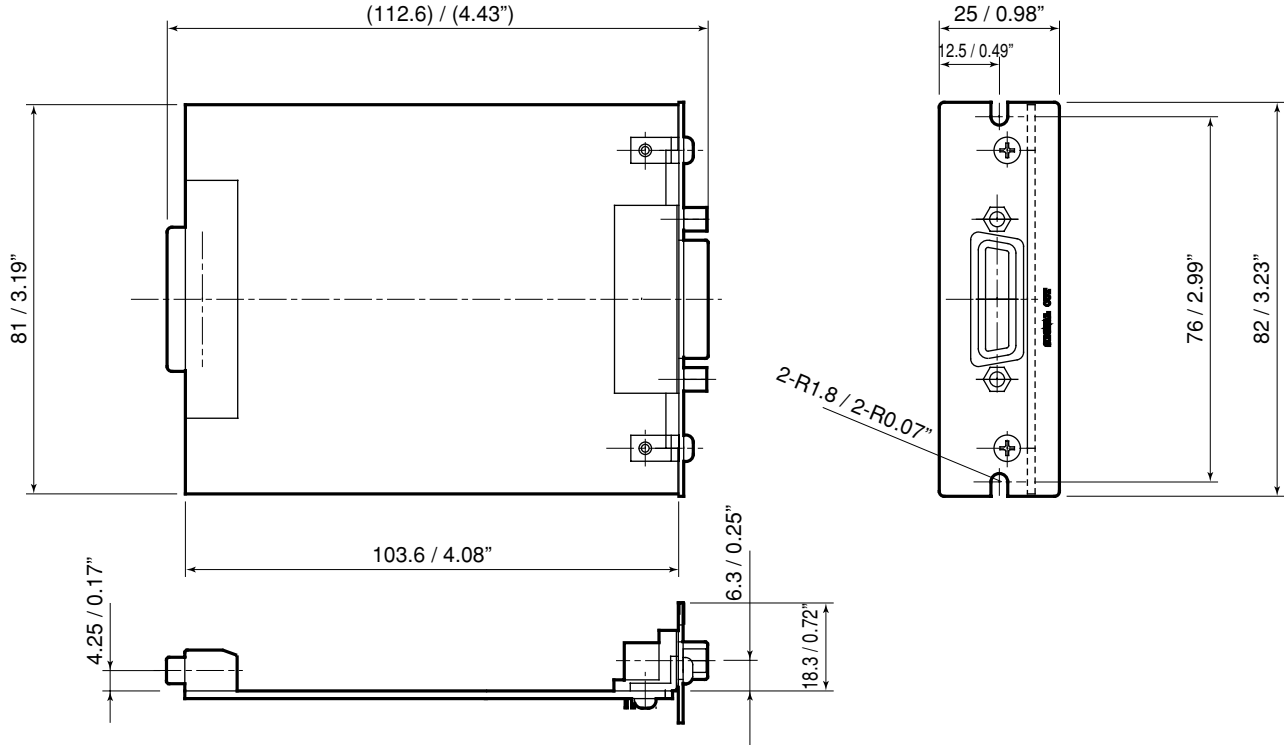
Guaranteed operating humidity range



8. DIMENSIONS

The outside appearance and specifications of this product are subject to partial change without notice in the course of improvement.

(Unit: mm/inch)



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