SONY

Laserscale detector
BD95-T51

1st edition

Sony Manufacturing Systems Corporation

CONTENTS

1. General precautions

The following is general precautions for users to use our products correctly.
So, follow various items written in the operation manuals and explanations which are asking for attention, and handle properly.

- At the time of starting machine while in operation, verify that functions and performance of our product work normally before use.
- In the case that our products have troubles, use with enough preventive measures to prevent various damages.
- We can not guarantee functions and performance of our product unless it is used as per its standard given in specifications or in case our products are reconstructed.
- In the case of using our products combined with other equipment, use them after thorough investigation of working condition, environment and so on in order to assure the function and performance in full.

2. Model Name and Features

Model name : BD95-T51

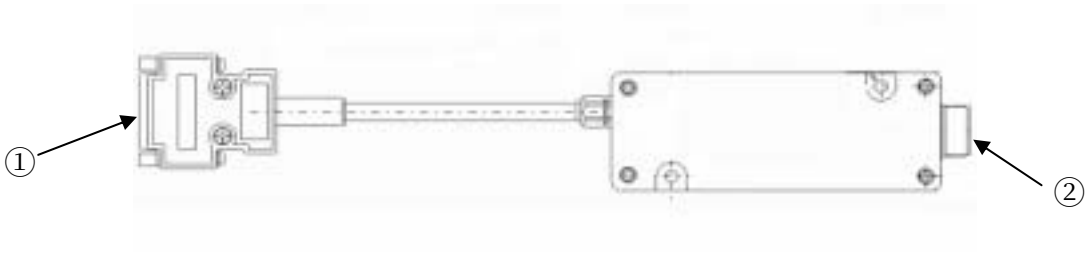
Features :

- Output 1Vp-p analog signal which has 2.5Vdc offset voltage connected with BS65 and BS65-R Laserscale.
- Reference point signal can be output that is one side direction.

3. Caution on handling

- Do not connect and disconnect connector of Laserscale absolutely providing power source because Laserscale head is destructed.
- Do not pass head connecting cable through same duct as power line.
- Provide power from power source with less noise.
- Part more than 0.5m from high power voltage source, heavy current source and super power relay etc.
- Use at ambient temperature ranging from 0 to +50°C.
  Keep off direct sunlight, place where hot wind blows and heaters.
- Do not touch the connector pin of output connector by hand. Install protect cap to the output connector when you will return the product as maintenance.

4. Parts name and function



① Connector for Laserscale connection

Connect to Laserscale BS65-R series.

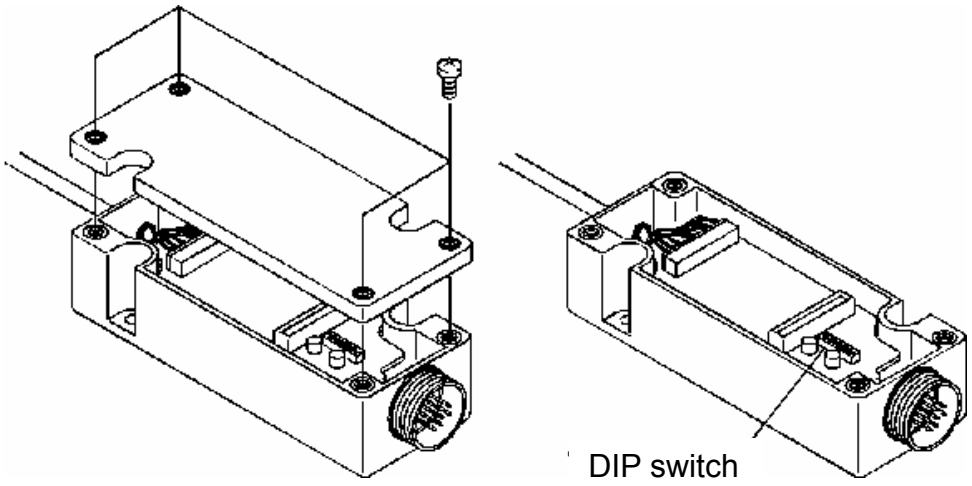
Be sure to make connection scale connector and it by a screw.

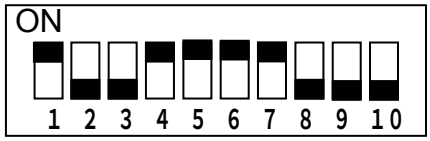
② Output connector

Output 1Vp-p analog signal.

Input power supply.

5. DIP switch setting





Factory setting

MODE switch 1, 2
Set always #1 is “ON”, #2 is “OFF”

MODE switch 3
Set always “OFF”

MODE switch 4
Set always “ON”

MODE switch 5
Set always “ON”

MODE switch 6
Set always “ON”

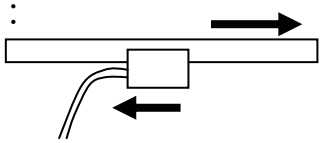
MODE switch 7
Set always “ON”

MODE switch 8
Set always “OFF”

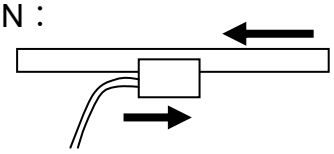
MODE switch 9 (Reference point detection direction switch)

Select reference point detection direction

OFF：



ON：



Set always “OFF” when using no refernce point scale BS78 type.

MODE switch 10
Set always “OFF”

6. Specifications

ITEMS	SPECIFICATIONS
Connected scale	BS65(R) Series（Disapprove of extending cable）
Signal pitch	0.1379＊＊＊＊μm（Connected with BS65） Output signal form is 1Vp-p
Maximum response speed	400mm/s
Reference point accuracy	Approx. ±0.1379μm(at 20°C) (Depending on the accuracy of machine movement) Maximum detection speed of reference point : 8mm/s Speed fluctuation : 0.2mm/s or less
Reference point signal	In synch with scale signal output for one direction
Output cable length	Max. 10m　(From output connector to peripheral)
Power supply	+5.0V to +5.4V DC　(At the output connector)
Power consumption	450 mA (No load)
Operating temperature	0 to +40 °C (No condensation)
Storage temperature	-10 to +50 °C

・Output signal specifications

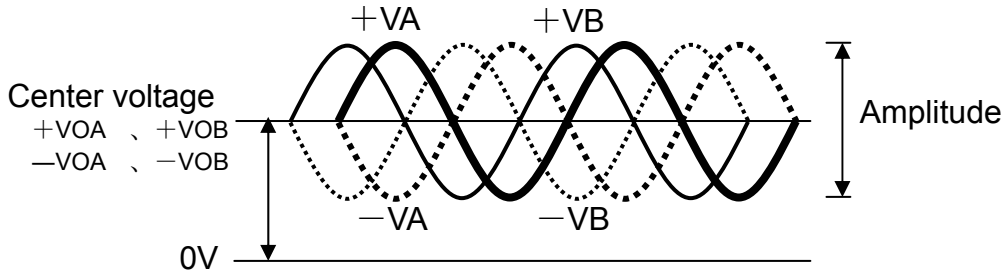
（At connecting the scale）

Item	Symbol	Specifications Min.	Typ.	Max.	Unit	Remarks
Output signal amplitude	(+VA)-(-VA) 、(+VB)-(-VB)	0.6	1	1.2	Vp-p	Note 1
Center voltage	+VOA , +VOB , -VOA , -VOB	2.3	2.5	2.7	V	
Offset voltage	(+VOA)-(-VOA) , (+VOB)-(-VOB)	-100	0	100	mV	
Load resistance			120		Ω	

Note1: When terminator Zo=120Ω, supply voltage +5.0V to+5.4V DC(voltage of load resistance at both ends)

Output waveform diagram (when each output is viewed based on 0V)

VA = SIN, VB = COS

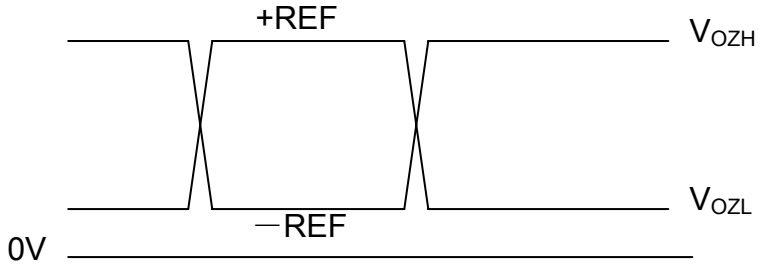


・ Reference point signal output specifications

The output specifications are compliant with EIA-422.

（Over the entire length and the entire operating temperature range）

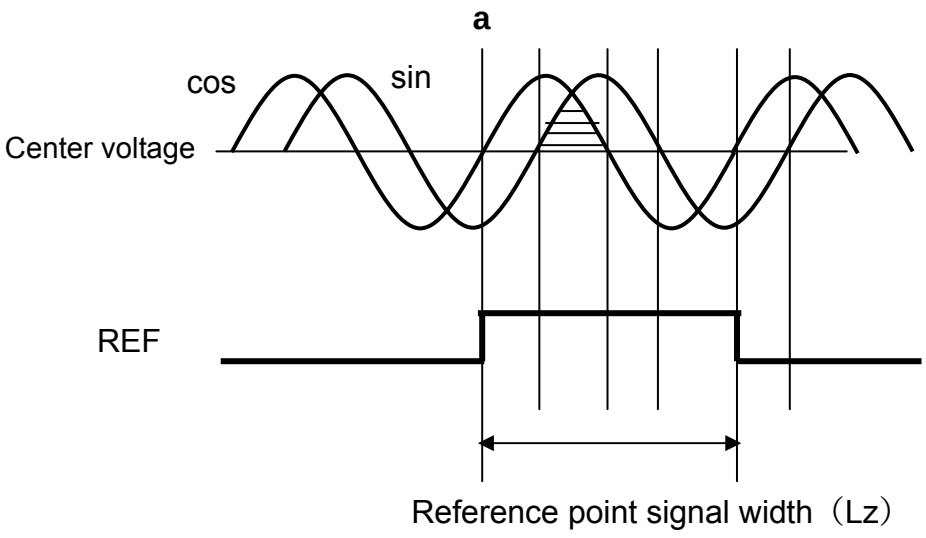
Item	Symbol	Specifications			Unit
		Min.	TYP.	Max.	
“H” level output	V_{OZH}	2.5	3.4	5	V
“L” level output	V_{OZL}	0	0.3	0.5	V



Reference point signal and SIN and COS signal phases

Item	Specifications		
	Min.	TYP.	Max.
Reference point signal width（Lz）	0.8λ （0.11μm）	1λ （0.1379μm）	1.2λ （0.1655μm）
Position of reference point signal edge “**a** “ to SIN signal	0°		90°

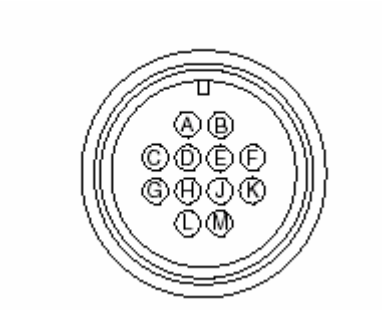
Reference point waveform diagram



7. Connector pin assign

Connector used (Output connector) :
R04-R12M (TAJIMI electronics Co., Ltd.)
Cable side connector (Soled separately)
Waterproof type : R04-P12F (TAJIMI electronics Co., Ltd.)
Non waterproof type : R03-PB12F (TAJIMI electronics Co., Ltd.)

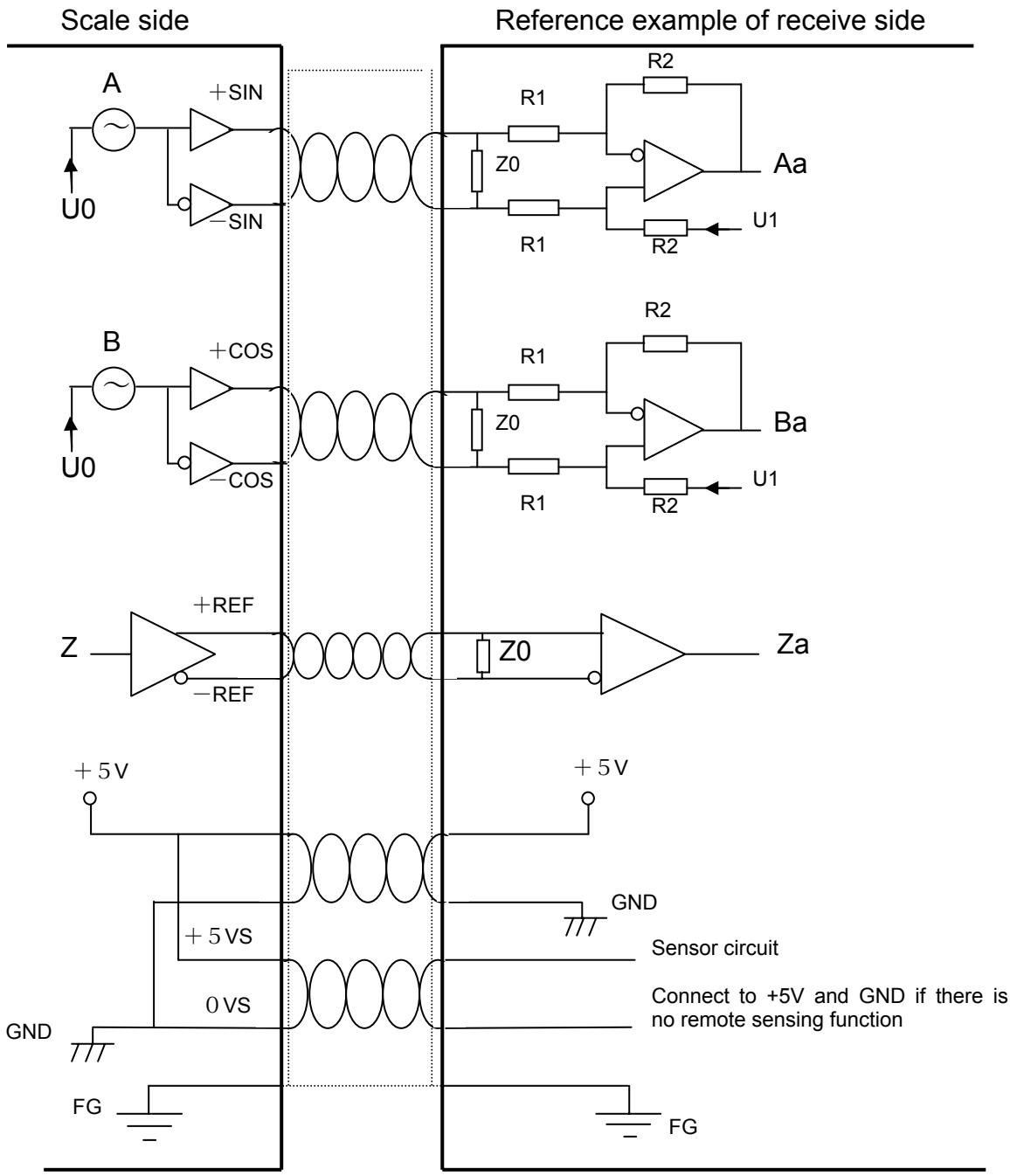
Pin No.	I/O signal
A	+COS
B	-COS
C	+SIN
D	-SIN
E	+REF
F	-REF
G	+5V(Power supply)
H	0V(Power supply)
J	0V(For signal)
K	0V(For signal)
L	+5VS
M	0VS



Note

- 0V is the circuit ground; it is not connected to the frame ground.
- Make sure that the power supply voltage is in the range +5.0V～+5.4V DC at the input connector of the I/F box.
- +5VS and 0VS are for remote sensing function. By connecting these pins, the voltage of input terminal is automatically maintained at the voltage value set on the power supply unit side even if the output cable is lengthened. If the power supply unit doesn't have remote sensing function, that must be connected with each terminal of power supply unit.
- Use a twisted pair with a thickness of 24 to 28 AWG for the output cable.
- In order to prevention of faulty wiring, all 0V terminals must be connected with cable.
- Use shielded cables for all cabling.
- Use twisted-pair cables for the output signals.
- Use cables so that the following signals are paired :+SIN, -SIN, +COS, -COS, +REF, -REF.

8. Example of input circuit



U0=U1=2.5V±0.2V　　Z0=120Ω

Recommended IC's

SIN・COS：　Differential receiver　LMH6654

R1=R2=10kΩ

REF　　：　DS34C86

9. Signal adjustment

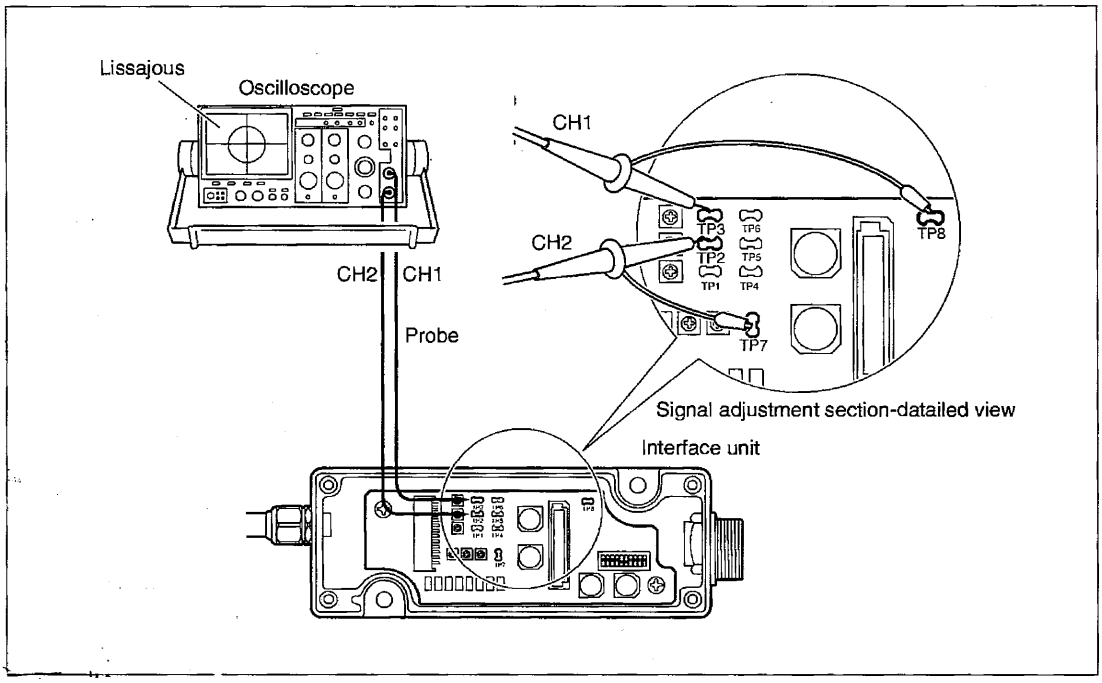
9-1 Preparation

Be sure the power supply is off.

Connect the I/F box(BD95-T51) to the BS65 scale unit.

Remove the cover of I/F box.

1. Connect CH1 probe of Oscilloscope to the check terminal of TP3 and TP8.
2. Connect CH2 probe of Oscilloscope to the check terminal of TP2 and TP7.



3. Set the TIME/DIV switch to the X-Y mode
4. Set the deviation sensitivity(VOLTS/DIV) of CH1 and CH2 to 0.5V/DIV.
5. Set the input coupling switches of CH1 and CH2 of the oscilloscope to GND and adjust the oscilloscope to locate the signal at the left side bottom.
6. Set the input coupling switches of CH1 and CH2 of the oscilloscope to DC.
7. Turn the I/F box's power on.

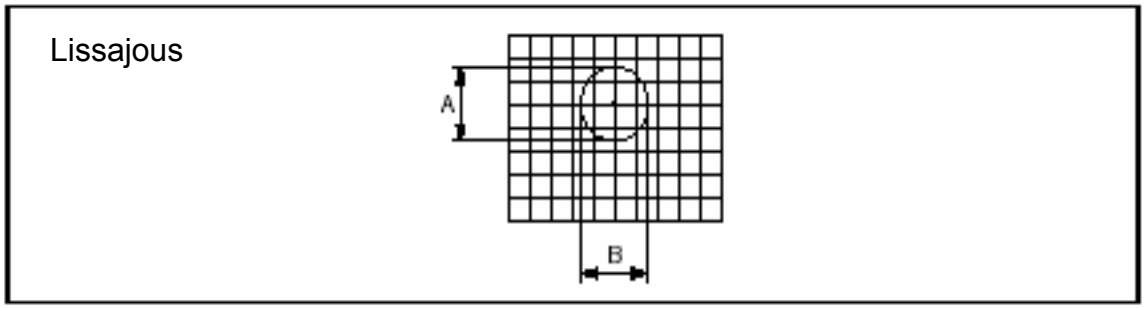
NOTE

Be sure to switch off the power supply to the I/F box before attaching or removing the connector.

9-2 Azimuth adjustment of the scale

Refer to the instruction manual of the scale in order to install the scale.
The scale which needs azimuth adjustment to get proper signal.
Move the scale, and make sure that the amplitudes A and B of the Lissajous' figure are 0.3Vp-p or greater over the entire length

The center level of Lissajous signal is approx. 2.5V.



10. Outline dimensions

Unit : mm