TOYO SOKKI

DLS-5031A

Digital Indicator

Operation Nanual

MA-00249-R1（2015/10）

Contents

To start operating

Thank you very much for purchasing the digital indicator DLS-5031A.
In order to use of the functions of this product, please read this manual.
DLS-5031A is a digital indicator equipped with 4 channels of strain gauge type converter input, and equipped with 4 channels of addition / subraction functions and a comparator function.
4 ch. input performs synchronized sampling 100 times per second.
In addition to the display of the measured value of each channel of A, B, C, D, display of calculated values such as A + B + C + D and A - B - C - D can be performed.
It has a comparator function for measured values and calculated values, and it is possible to output arbitrary comparison results 8 points by the open collector signal.
Also, as an option, 4 analog signals can be output corresponding to the measured value and calculated value by D/A conversion. The power supply used is AC100 - 240V wide input.

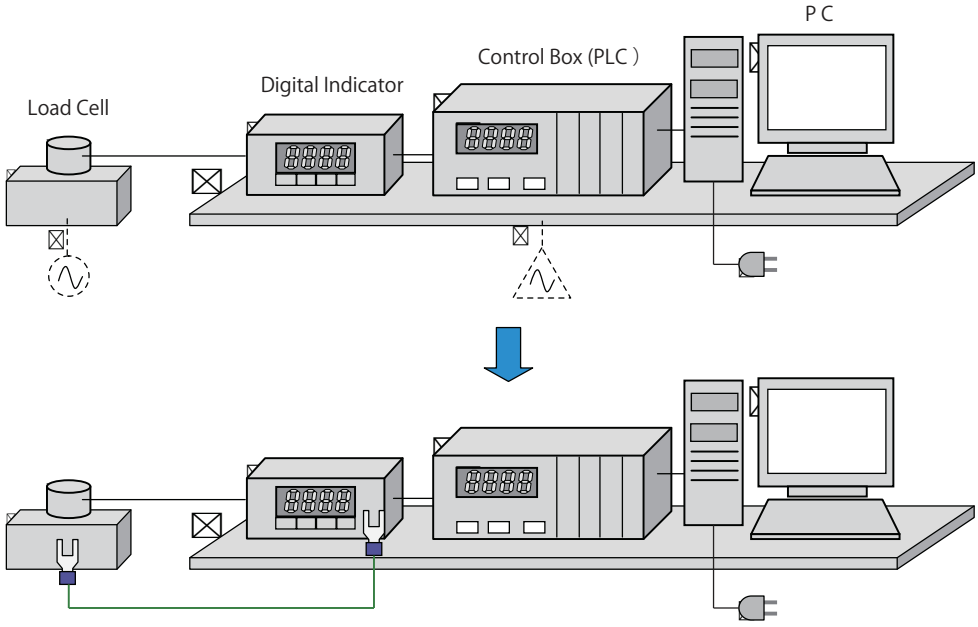
Installation precautions

- Operating temperature limit is 0℃～ 40℃. Install in a place not exposed to direct sunlight, no condensation.
- Operation power is AC100 - 240V. We recommend that you prepare a dedicated power supply if the power supply situation is bad.
- The body structure is pannel mount type. Please install using the supplied mounting bracket.
- When connecting to the terminal block, check the available AWG wire.
- Please groung either this product or each connected instrument.

For stable measurement

In some cases the displayed value may not be stable or the value it self may change when a strain gauge sensor is amplified by a DC amplifier and connected to another device.

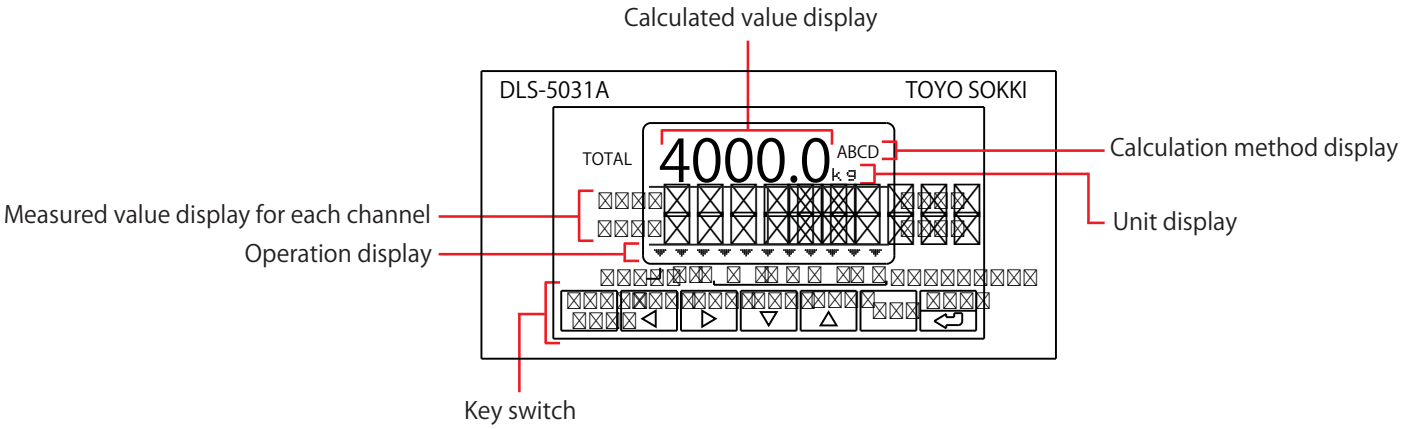
Cause : The reference potentials of the sensor part and the digital indicator part are different.
Induction coming around from general commercial power supply AC100V.



Countermeasure : Securely connect the sensor side object (or sensor body) to the ground terminal on the measurement side.
If the ground terminal on the measurement side can not be found, loosen the screw on the metal part of the body and adjust the potential in some way.

1. Appearance and name of each part

■ Front panel



Calculation method display

Display	Formula
ABCD	A+B+C+D
ABC-D	A+B+C-D
AB-CD	A+B-C+D
A-BCD	A-B+C+D

It can be set with [1 Function Set / 7 TOTAL display] in FUNCTION mode

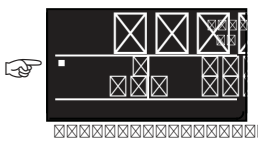
Operation display

Set in [6 weighing operation setting / unit display] in the function mode.

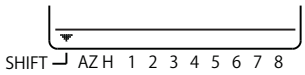
Conversion of the weighing value is not performed even if the display unit is changed.

Measurement value display for each Ch

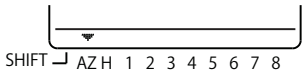
On the upper left of the display value ■ is indicates tare.



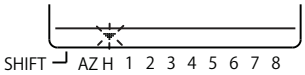
Operation Display



SHIFT：Light up during SHIFT operation



AZ：Light up during Taring of any channel.



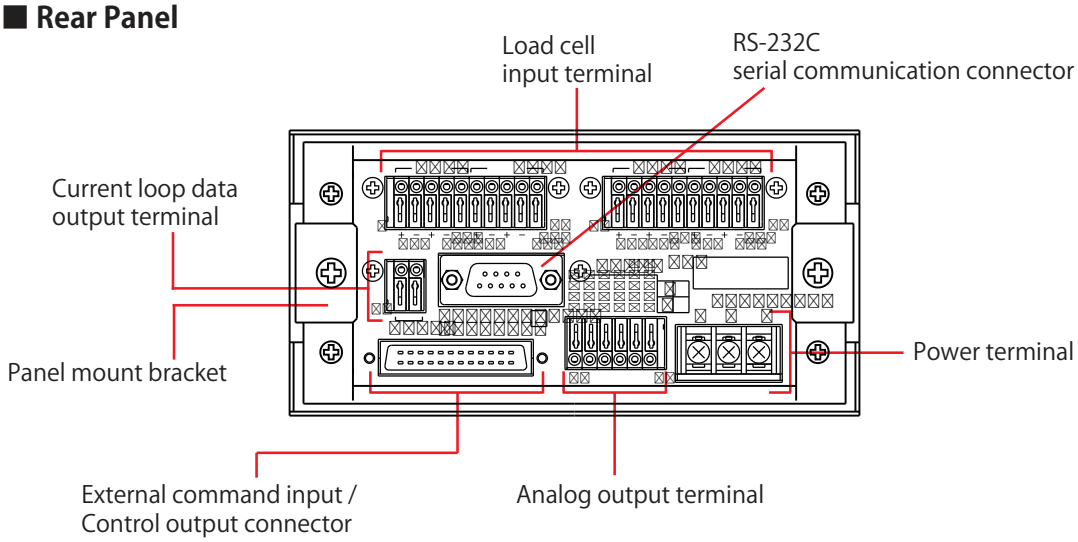
H：Blinking during hold

SP1 ～ 8：Light up when comparator 1 - 8 is in operation

Key Switch

Key	Movement during Weighing	Operation during various setting
SHIFT AZ.R	Press once to shift 1operation, press again switch to shift 2 operation.	
AZ-A ◀	Continue to press key for 1 sec. to tare Ach	Select a major classification of setting items
	Press key for 1 second during Shift 1 operating to cancel tare all Ch.	In case of selection numerical setting, select digit to change, in case of candidate selection, select candidate.
	Press key for 1 second during Shift 2 operating to cancel tare Ach.	
AZ-B ▶	Continue to press key for 1 sec. to tare Bch	Select a major classification of setting items
	Press key for 1 second during Shift 1 operating to cancel tare all Ch.	In case of selection numerical setting, select digit to change, in case of candidate selection, select candidate.
	Press key for 1 second during Shift 2 operating to cancel tare Bch.	
AZ-C ▼	Continue to press key for 1 sec. to tare Cch	Select a minor classification of setting items
	There is no function while Shift 1 running	Change the value of the digit selected in the numerical setting
	Press key for 1 second during Shift 2 operatig to cancel tare Cch	
AZ-D ▲	Continue to press key for 1 sec. to tare Dch	Select a minor classification of setting items
	There is no function while Shift 1 running	Change the value of the digit selected in the numerical setting
	Press key for 1 second during Shift 2 operatig to cancel tare Dch	
ESC	Set / Cancel key lock by holding down for 2 seconds	End of setting
		Cancel during change
	Cancel shift operation during shifting	Power on / off 3 times to set / cancel cal lock
FUNC ↵	Move to function mode by holding down key for 1 second.	Memory of setting value
	There is no function while Shift 1 running	

■ Rear Panel



2. Function and Operation

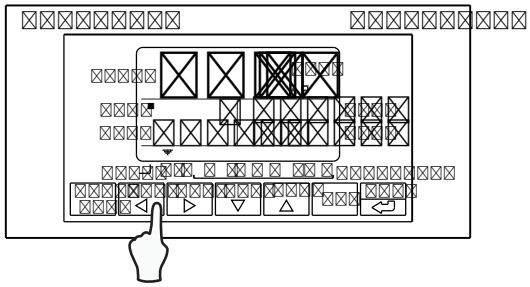
2-1. Weighing mode

■ Tare Off

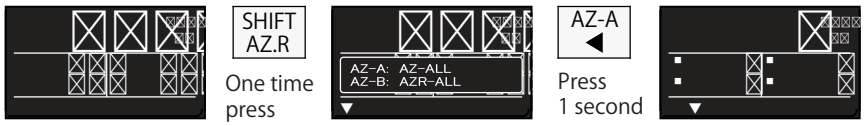
Tare off for each channel

AZ-A ◀ | AZ-B ▶ | AZ-C ▼ | AZ-D ▲

Press and hold for 1 second to tare off each channel.
It is displayed with a ▼ mark above the taring CH.

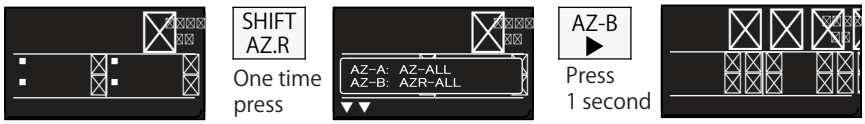


Tare off all channels.



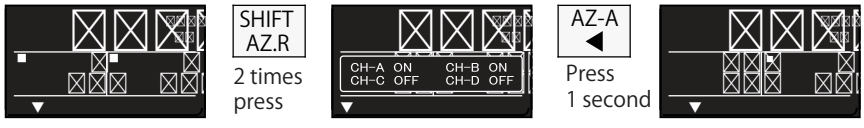
Tear off all channels

Cancel tare off for all channels



Cancel tare off

Cancel tare off for each channel



Ch A, Ch B under taring off

Cancel tare off Ch A

※ The tare value is stored, so it will not disappear even if the power is off.

■ Preset tare off

It can be tared an item who knows tare vale in advance. By this setting, it will perform always taring.

≪Setting procedure≫

FUNC Press for 1 sec.

```
項目選択
1 機能設定
      ESC:戻る
```

AZ-D press until the below screen appears

```
5 ネット演算
プリセット風袋引
      ESC:戻る
```

AZ-B selection

```
5 ネット演算
プリセット風袋引
      ESC:取消
```

Blinks selected part

FUNC press for determination

```
5 ネット演算
 SET
      ESC:戻る
```

```
5 ネット演算
プリセット風袋引
      ESC:戻る
```

AZ-C press to select Ch A ～ C h D

```
1 Pre風袋値A
+00000
      ESC:戻る
```

AZ-B press one time

```
1 Pre風袋値A
+ 0000
      ESC:取消
```

During setting, the par to set blinks

AZ-A AZ-B AZ-C AZ-D

Input desired value
(Setting range：0 ～ +99999)

```
1 Pre風袋値A
+01000
      ESC:取消
```

FUNC press for determination

```
1 Pre風袋値A
SET
      ESC:戻る
```

```
1 Pre風袋値A
+01000
      ESC:戻る
```

ESC press for returning to main display

■ Net calculation

It is used when weighing something who knew the content in advance

≪Setting procedure≫

FUNC press 1 second

AZ-D press until below screen appears

AZ-B selection

Blinks selected part

FUNC press and determine

AZ-C press to select Ch A ～ C h D

AZ-B press one time

During setting,
the par to set blinks

AZ-A AZ-B AZ-C AZ-D

Input desired value
(Setting range：0 ～ +99999)

- If you press AZ-A ~ AZ-Z key during weighing, remaineder obtained by substracting the set net value from the measured value is stored as the tare value.
- Select one of preset taring function and net calculation function.

■ Display and Hold

In the part where you set display value can hold.

≪Setting procedure ① select point where you wish to hold ≫

FUNC press 1 second

Press AZ-D until below screen appears

Press AZ-B to select

Blinks selected part

Blinks selected part

FUNC press for determination

Press ESC to return to main screen

≪ Setting procedure ② Select Application item≫

FUNC press 1 second

```
項目選択
1 機能設定
        ESC:戻る
```

Press AZ-B until the below screen appears

```
項目選択
3 外部指令入力
        ESC:戻る
```

Press AZ-C intermittently

From here you can select which section to hold（1~8）

```
1 外部入力1動作
HOLD
        ESC:取消
```

External input 1 operation

・
・
・

```
8 外部入力8動作
HOLD
        ESC:取消
```

External input 8 operation

After selecting

AZ-B press to display 「HOLD」

```
1 外部入力1動作
-HOLD-
        ESC:取消
```

Blinks selected part

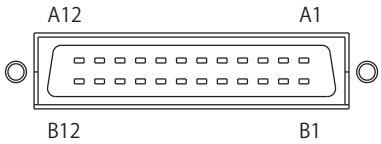
FUNC press to determine

```
1 外部入力7動作
 SET
        ESC:戻る
```

```
1 外部入力1動作
HOLD
        ESC:戻る
```

ESC press for returning to main display

Connect a switch to the back terminal of the selected external command input number

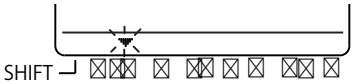


Ex.) Connecting method when external input 1
A1-A5（B5）

※ See appendix's output terminal table

- Holds while the external command input switch is ON. Holding the data during maximum value (peak) hold and minimum value (bottom) hold also updates the display.

- H blinks during hold



■ Maximum display

Function to alarm over load of load cell

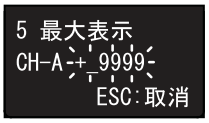
≪ Setting procedure≫

FUNC press 1 second

AZ-B press until below screen appears

AZ.R-B press until below display appears

AZ-B press 1 time



blinks selected part

AZ-A AZ-B AZ-C AZ-D

by using keys, enter the value you wish to set
(setting range：0 ～ +99999)

FUNC press and determine

ESC

press to return to the main screen

- The weighing value is informed by flashing when the set value is exceeded
- It can not oprerate tea off while the maximum display is exceeded

※ the same procudure for each Ch.

■ Comparator output

It can be operated comparator motion setting

a. Comparator upper limit peration

≪Setting procedure≫

FUNC press 1 second

AZ-B press 1 time

AZ-D press until below screen appears

AZ-B by using this key,
select item you wish to set

(※Set Ch-A upper limit operation here)

blinks selected part

FUNC press and determine

Setting of「Operation」is finished here.
Continue to set the「Quantitative value」

AZ-D press until the below screen apprears

AZ-B press 1 time

blinks setting part

AZ-A AZ-B AZ-C AZ-D

using keys, enter the value you wish to set
(setting range：0 ～ +99999)

FUNC press and determine

● With this setting, the comparator output works when the value of Ch-A became 100.0

a. Comparator upper limit operation （Hysteresis setting）

≪Setting procedure≫

FUNC press 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

AZ-B press 1 time

```
項目選択
2 コンパレータ
      ESC:戻る
```

AZ-D press until the below screen appears

```
9 SP1 HYS
 00000
      ESC:戻る
```

AZ-B press 1 time

```
1 SP1 HYS
 0000
      ESC:取消
```

set part blinks

AZ-A AZ-B AZ-C AZ-D

by using this, enter value you wish to set
(Setting range：0 ～ +99999)

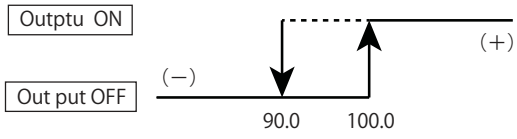
```
1 SP1 HYS
 0010.0
      ESC:取消
```

FUNC press and determine

```
1 SP1 HYS
 SET
      ESC:戻る
```

```
1 SP1 HYS
 0010.0
      ESC:戻る
```

● With this input operation, the following operation has been set



b. Comparator down lower limit operation

≪Setting procedure≫

FUNC press 1 second

AZ-B press until below screen apprears

AZ-D press until below screen appears

AZ-B by using this, select you wish to set
(※ Select Ch-A lower limit operation here)

blinks selected part

FUNC press and determine

Setting of「Operation」is finished here.
continue to set the 「Quantitative value」

AZ-D press until the below screen appears

AZ-B press 1 time

blinks selected part

AZ-A AZ-B AZ-C AZ-D

using keys, enter the value you wish to set
(Setting range：0 ～ +99999)

FUNC press and determine

● With this setting, the comparator output works when the value of Ch-A becomes 100.0

b. Comparator down limit operation （Hysteresis setting）

≪Setting procedure≫

FUNC press 1 second

```
項目選択
1 機能設定
        ESC:戻る
```

AZ-B press unitl the below display screen

```
項目選択
2 コンパレータ
        ESC:戻る
```

AZ-D press unitl the below display appears

```
9 SP1 HYS
  00000
        ESC:戻る
```

AZ-B press 1 time

```
1 SP1 HYS
 -0000-
        ESC:取消
```

blinks selected part

AZ-A AZ-B AZ-C AZ-D

use above keys, input value you wish to set
(setting range：0 ～ +99999)

```
1 SP1 HYS
-0010.0-
        ESC:取消
```

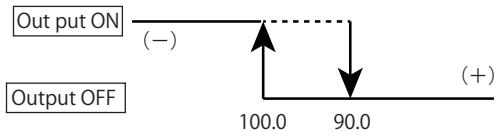
bliks setting part

FUNC press and determine

```
1 SP1 HYS
 SET
        ESC:戻る
```

```
1 SP1 HYS
 0010.0
        ESC:戻る
```

● With this input following the previous page, the following operation has been set.



c. Delay time setting

It can be delayed the time to turn of the external output after the comparator makes upper / lower limit judgment

≪Setting procedure≫

FUNC press 1 secong

AZ-B press until the below screen appears

AZ-D press until the below screen appears

AZ-B press 1 time

blinks selected part

AZ-A AZ-B AZ-C AZ-D

by using this, enter value you wish to set
（setting range：0 ～ +9.99）

bliks set part

FUNC press and determine

d. Error detection setting

Inform the operating status of the main unit
Abnormal operation such as power off or over display turns off the output

≪Setting procedure≫

FUNC press 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

AZ-B press 1 time

```
項目選択
2 コンパレータ
      ESC:戻る
```

AZ-D press until the below display appears

```
25 SP1 動作
割当て無し
      ESC:戻る
```

AZ-B press 1 time

```
25 SP1 遅延
-割当て無し-
      ESC:取消
```

blinks selected part

AZ-B press key

```
25 SP1 遅延
-異常検出-
      ESC:取消
```

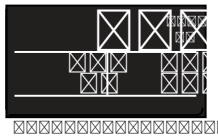
bliks set part

FUNC press and determine

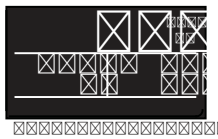
```
25 SP1 動作
 SET
      ESC:戻る
```

```
25 SP1 動作
異常検出
      ESC:戻る
```

When setting is completed, the main display shows the following



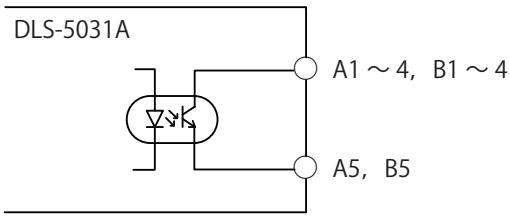
【Normal】 ▼Lighting



【Abnormal】 ▼"OVER" blinks

(In this case, an abnormality in Ch-A is suspected)

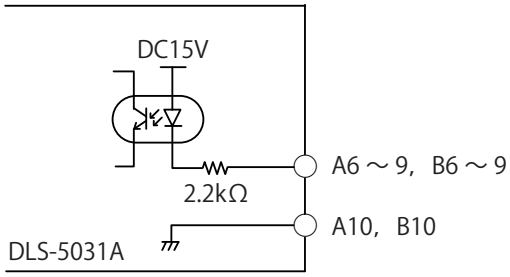
e. Output circuit diagram



■ External command Input

Eight photocoupler inputs are mounted as external command inputs

The input operation is selcted in "3 External Command Input" of function mode.

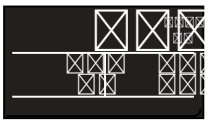


Comparator command input circuit diagram

■ Key lock

it is a function to prevent key misoperation. (Accept external input)

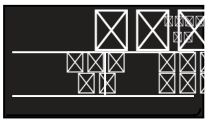
≪Setting procedure：Key lock≫



Operation displaying

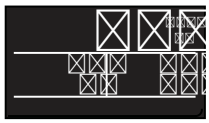
ESC press for 2 seconds

Key lock start screen



Operation resume screen

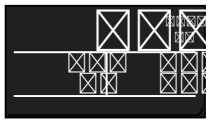
≪Setting procedure：Cancel key lock≫



Operation displaying
(During key lock)

ESC press for 2 seconds

Key unlock screen



Operation resume screen

■ CAL lock

It is possible to prevent the change of sensitivity calibration value due to key mistake

≪Setting procedure≫

Power ON.

Press [ESC] 3 times continuously while the upper screen is displayed

Press [AZ-B ▶] 1 time

blinks selected part

Press [AZ-B ▶]

bliks set part

Press [FUNC ↵] and determine

press [ESC] to return to main screen

2-2. TEST MODE

This is the operation check function of the indicator main unit

≪Setting procedure≫

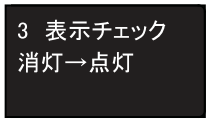
Turn of power

Press FUNC 3 times continuously while the upper screen is displayed

It can be entered by pressing FUNC 3 times continuously in function mode "11 Test Mode"

By using AZ-C ▼ AZ-D ▲, select test item

「**Program Ver**」
display version



「**Display check**」
Lighting check with VFD display

Each time pressing AZ-A ◀ AZ-B ▶
Guide display・all off・confirmed all on

「**Key check** 」
key check

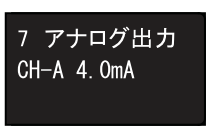
SHIFT AZR | AZ-A ◀ | AZ-B ▶ | AZ-C ▼ | AZ-D ▲ | ESC | FUNC
pressed key is displayed ●

「**External input**」
check External command input

The input turned on ● will be displayed

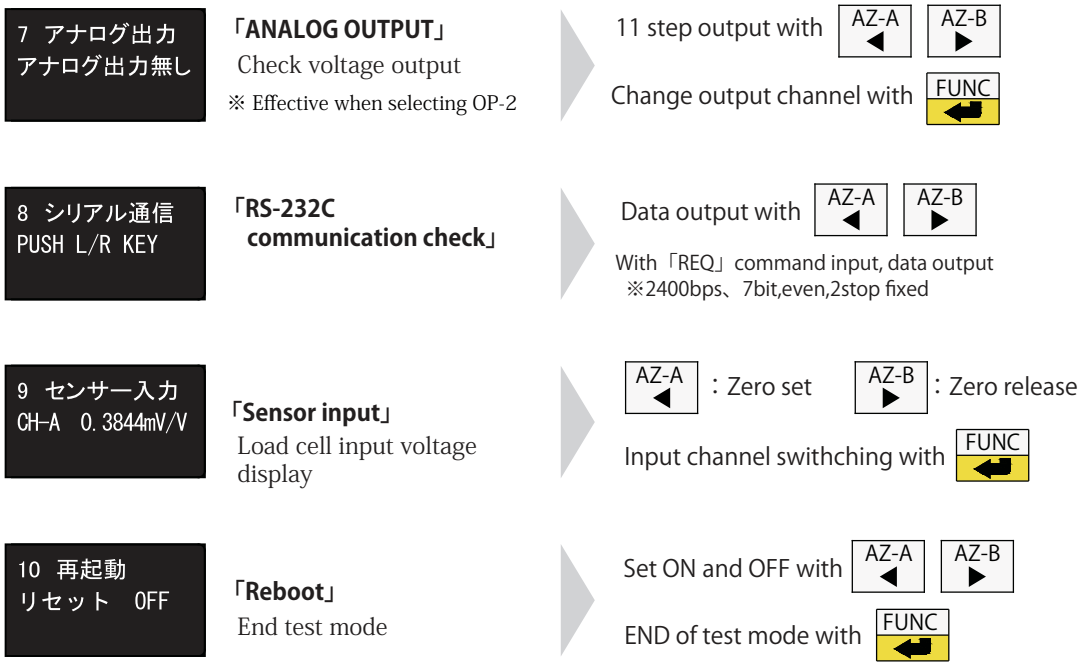
「**External output**」
check External output

With AZ-A ◀ AZ-B ▶, it can be changed output
Check in ● display



「**Analog output**」
confirm current output
※ Effective when selecting OP-1.

11 step output with AZ-A ◀ AZ-B ▶
Output channel change with FUNC



ATTENTION

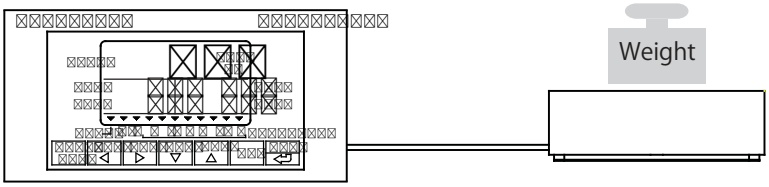
In the test mode, the display and external input / output signals are different from those normal weighing. If an external control unit is connected, please take measures to prevent abnormal operation and then execute.

3. CALIBRATION

There are two types of methods for matching the load cell and indicators 「Actual load calibration」 and 「Equivalent input calibration」

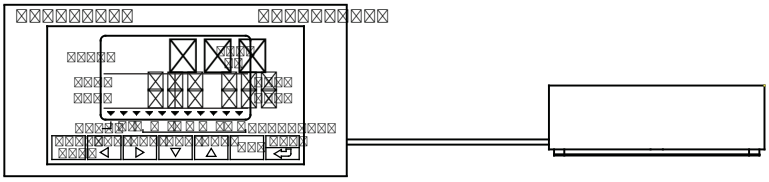
≪Actual load calibration≫

This is a calibration method that applies and actual load by a weight to a load cell and key-in that value.



≪Equivalent input calibration≫

It is a method to do calibration only by keying in the rated output value（mV/V）of the load cell and the display value



In the test report attached to the load cell enter two values, Rated Capacity and Rated Output.

3-1. Preparation prior to calibrate

≪Setting procedure≫ Preparation before calibration ① CAL Lock unlocking

Turn on power

Press [ESC] 3 times while displaying upper screen

Press [AZ-B ▶] 1 time

blinks selected part

Press [FUNC ↵] and determine

Press [ESC] to return to main screen

≪Setting method≫ Preparation before calibration② Weighing operation setting

FUNC press 1 second

項目選択
1 機能設定
ESC:戻る

AZ-B press unitl the below screen appears

項目選択
6 計量動作設定
ESC:戻る

Press AZ-D 1 time

1 単位表示
☒☒
ESC:戻る

Select the unit display from here

Press AZ-B to go and select the unit you want to display.

1 単位表示
☒☒
ESC:取消

blinks desired indicator

Press FUNC and determine

1 単位表示
☒☒
ESC:戻る

Press AZ-C until the below display appears

2 小数点位置
0
ESC:戻る

Select the decimal point position from here

Press AZ-B to go and select the position you want to display

2 小数点位置
0.0
ESC:取消

blinks desired positon

FUNK press and determine

2 小数点位置
0.0
ESC:戻る

Press AZ-D until the below scree appears

3 最小目盛
0.2
ESC:戻る

Select minimum scale from here

Press AZ-B to go and select the position you want to display.

3 最小目盛
0.1
ESC:取消

blinks desired indicator

FUNC press and determine

3 最小目盛
0.1
ESC:戻る

Press ESC, return to the below screen

項目選択
6 計量動作設定
ESC:戻る

≪Setting prcedure≫ Preparation before calibration ③ CH setting

Press FUNC 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

Press AZ-B until the below screen appers

```
項目選択
7 CH-A設定
      ESC:戻る
```

AZ-D press 1 time

```
1 フィルタ条件
CH-A OFF
      ESC:戻る
```

Select condition of moving average from here

Press AZ-B to select condition

```
1 フィルタ条件
CH-A OFF
      ESC:取消
```

blinks desired indicator

FUNC press and determine

```
1 フィルタ条件
CH-A OFF
      ESC:戻る
```

Press AZ-D until the below screen appears

```
1 フィルタ強度
CH-A 32t
      ESC:戻る
```

Select the number of moving averages from here

Press AZ-B to select condition

```
1 フィルタ強度
CH-A 32t
      ESC:取消
```

blinks desired indicator

FUNC press and determine

```
1 フィルタ強度
CH-A 32t
      ESC:戻る
```

Press AZ-D until the below screen appers

```
3 ZT動作条件
CH-A OFF
      ESC:戻る
```

Set the condition of the zero track from here

Press AZ-B to select condition

```
3 ZT動作条件
CH-A OFF
      ESC:取消
```

blinks desired indicator

FUNC press and determine

```
3 ZT動作条件
CH-A OFF
      ESC:戻る
```

Press AZ-D until the below screen appears

```
4 ZT動作時間
CH-A 1.0s
      ESC:戻る
```

Set the time of the zero track from here

Press AZ-B to select condition

```
4 ZT動作時間
CH-A 1.0s
      ESC:取消
```

blinks desired indicator

FUNC press and determine

```
4 ZT動作時間
CH-A 1.0s
      ESC:戻る
```

Press ESC return to the below screen

```
項目選択
7 CH-A設定
      ESC:戻る
```

Perform the same procedure for CH-B, CH-C, CH-D

≪Setting procedur≫ Preparation before calibration ④CH setting

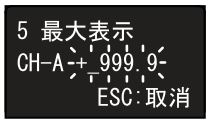
FUNC press 1 second

Press AZ-B until the below screen appers

Press AZ-D until the below screen appers

Select setting of Maximum number of digit from here

AZ-B press 1 time



blinks setting part

Use AZ-A AZ-B AZ-C AZ-D and enter the value you widh to set

FUNC press and determine

Press ESC to return to the below screen

Press AZ-B go to CH-B screen

Perform the same procedure for CH-B, CH-C, CH-D

3-2. Actual load calibration

≪Setting procedure≫ CH-A

FUNC press 1 second

項目選択
1 機能設定
ESC:戻る

Press AZ-B go to the below display

項目選択
11 CH-A校正
ESC:戻る

AZ-D press 1 time

1 ゼロ点校正
CH-A +0000.0
0.0000mV/V
ESC:戻る

☞ Check ! nothing is on the weighing platform

Press AZ-B

1 ゼロ点校正
CH-A +_000.0
0.0000mV/V
ESC:取消

blinks setting value

FUNCS press and determine

1 ゼロ点校正
CH-A +0000.0
0.0000mV/V
ESC:戻る

Setting complete screen

AZ-D press 1 time

2 SPAN1校正
CH-A +0000.0
0.0000mV/V
ESC:戻る

☞ Place a weight on to the weighing plate

Press AZ-B

2 SPAN1校正
CH-A +0_00.0
1.0000mV/V
ESC:取消

blinks setting part

AZ-A AZ-B AZ-C AZ-D

Use keys to enter the value you wish to set

2 SPAN1校正
CH-A +0100.0
1.0000mV/V
ESC:取消

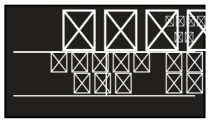
FUNC press and determine

2 SPAN1校正
CH-A +0100.0
1.0000mV/V
ESC:戻る

Press ESC return to the belwo screen

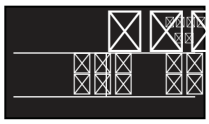
項目選択
11 CH-A校正
ESC:戻る

Press ESC return to the main screen



Complete setting

☞ Take a weight out



Perform the same procedure for CH-B, CH-C, CH-D

3-3. Equivalent input calibration

≪Setting procedure≫ CH-A

FUNC press 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

Press AZ-B to go to the below screen

```
項目選択
11 CH-A校正
      ESC:戻る
```

Press AZ-D to go to the belwo screen

```
3 ゼロ点等価入力
CH-A +0.0168mV/V
      ESC:戻る
```

Press AZ-B

```
3 ゼロ点等価入力
CH-A +_.0168mV/V
      ESC:取消
```

blinks setting value

AZ-A AZ-B AZ-C AZ-D

Use the keys, input zero input voltage of load cell

FUNC press and determain

```
3 ゼロ点等価入力
CH-A +0.0000mV/V
      ESC:戻る
```

Setting completion screen

AZ-D press 1 time

```
4 SPAN1等価表示
CH-A  +000.0
      ESC:戻る
```

Press AZ-B

```
4 SPAN1等価表示
CH-A  +_000.0
      ESC:取消
```

blinks setting value

AZ-A AZ-B AZ-C AZ-D

Use the keys, input display of span equivalent input value

FUNC press and determine

```
4 SPAN1等価表示
CH-A  +0100.0
      ESC:戻る
```

AZ-D press 1 time

```
5 SPAN1等価表示
CH-A +1.0000mV/V
      ESC:戻る
```

Press AZ-B

```
5 SPAN1等価表示
CH-A +_.0000mV/V
      ESC:戻る
```

blinks setting value

AZ-A AZ-B AZ-C AZ-D

Use keys, input span input voltage of load cell

```
5 SPAN1等価表示
CH-A +1.0002mV/V
      ESC:取消
```

blinks setting part

FUNK press and determine

```
5 SPAN1等価表示
CH-A +1.0002mV/V
      ESC:戻る
```

Press ESC return to the below screen

```
項目選択
11 CH-A校正
      ESC:戻る
```

Perform the same procedure for CH-B, CH-C, CH-D

4. Varius output settings

Only one option can be installed at the time of shipment from our factory

4-1. 4～20mA（OP-1），0～±10V（OP-2）

After the input signal from the load cell is A/D converted to be a calculated value, and the measured value is D/A converted to be an analog output. The scaling function can be used to set the display value for outputting 4mA or 0V and the display value for outputting 20mA or 10V by key operation.
In addition, the output of 4mA and 20mA or 0V, +10V,-10V can be finely adjusted to adjust the error with the receiving instrument. 4 - 20mA or using the test mode step out can be made 11 steps between -10V and +10V.

■ OP-1：4～20mA Current output scaling・Fine adjustment

≪Setting procedure≫

FUNC press 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

Press AZ-B until the below screen appears

```
項目選択
4 アナログ出力
      ESC:戻る
```

Press AZ-D until the below screen appears

```
1 A.I SEL
NET
      ESC:戻る
```

CH-A
Select output data

AZ-B press 1 time

```
1 A.I SEL
-NET-
      ESC:取消
```

blinks setting part

AZ-B select

FUNC press and determine

```
1 A.I SEL
NET
      ESC:戻る
```

Press AZ-D until the below screen appears

```
2 A.4mA SCL
+00000
      ESC:戻る
```

CH-A
Set 4mA output display value

AZ-B press 1 time

```
2 A.4mA SCL
-+_0000-
      ESC:取消
```

blinks setting part

AZ-A AZ-B AZ-C AZ-D

Use keys, set the display value to output 4mA to the analog output

```
2 A.4mA SCL
-+01000-
      ESC:取消
```

blinks the setting part

FUNK press and determine

```
2 A.4mA SCL
+01000
      ESC:戻る
```

Press AZ-D until the below screen appears

```
3 A.20mA SCL
+00000
      ESC:戻る
```

CH-A
Set 20mA output display value

AZ-B press 1 time

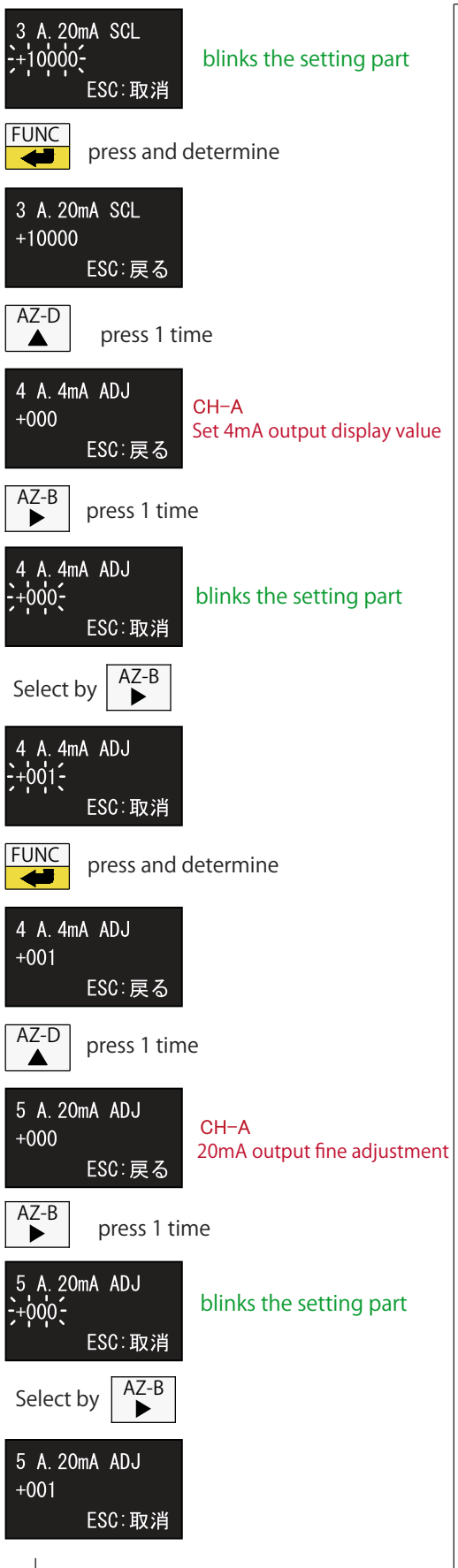
```
3 A.20mA SCL
-+_0000-
      ESC:取消
```

blinks setting part

AZ-A AZ-B AZ-C AZ-D

Use keys to set display value to output 20mA to analog output

to next page


3 A. 20mA SCL
+10000
ESC:取消
blinks the setting part
FUNC
press and determine
3 A. 20mA SCL
+10000
ESC:戻る
AZ-D
press 1 time
4 A. 4mA ADJ
+000
ESC:戻る
CH-A
Set 4mA output display value
AZ-B
press 1 time
4 A. 4mA ADJ
+000
ESC:取消
blinks the setting part
Select by AZ-B
4 A. 4mA ADJ
+001
ESC:取消
FUNC
press and determine
4 A. 4mA ADJ
+001
ESC:戻る
AZ-D
press 1 time
5 A. 20mA ADJ
+000
ESC:戻る
CH-A
20mA output fine adjustment
AZ-B
press 1 time
5 A. 20mA ADJ
+000
ESC:取消
blinks the setting part
Select by AZ-B
5 A. 20mA ADJ
+001
ESC:取消
FunC
press and determine
5 A. 20mA ADJ
+001
ESC:戻る
AZ-D
press 1 time
6 B. I SEL
NET
ESC:戻る
CH-B
Select output data
Follow the same procedure as for CH-C,CH-D
Perform the same tasks as the setting「1 A.I SEL」
to「5 A.20mA ADJ」
AZ=D
press 1 time
21 T. 4mA SCL
+10000
ESC:戻る
TOTAL
Select output data
Perform the same operation as the setting from
「2 A. 4mA SCL」to「5 A.20mA ADJ」
Press ESC return to the below screen
項目選択
4 アナログ出力
ESC:戻る

■ OP-2：0 ～ ±10V　voltage output scaling ・Fine adjustment

≪Setting procedure≫

FUNC press 1 second

```
項目選択
1 機能設定
      ESC:戻る
```

Press AZ-B until the below screen appears

```
項目選択
4 アナログ出力
      ESC:戻る
```

AZ-D press 1 time

```
1 A.V SEL
NET
      ESC:戻る
```

CH-A
Select output data

AZ-B press 1 time

```
1 A.V SEL
-NET-
      ESC:取消
```

blinks setting part

Select by AZ-B

FUNC press and determine

```
1 A.V SEL
NET
      ESC:戻る
```

AZ-D press 1 time

```
2 A.0V SCL
+00000
      ESC:戻る
```

CH-A
Set 0V output display value

AZ-B press 1 time

```
2 A.0V SCL
-+ 0000-
      ESC:取消
```

blinks the setting part

AZ-A AZ-B AZ-C AZ-D

Use keys to set display value to output 0V to the CF-A analog output using

```
2 A.0V SCL
-+00100-
      ESC:取消
```

FUNK press and determine

```
2 A.0V SCL
+00100
      ESC:戻る
```

AZ-D press 1 time

```
3 A.10V SCL
+10000
      ESC:戻る
```

CH-A
Select 10V output display value

AZ-B press 1 time

```
3 A.10V SCL
-+ 1000-
      ESC:取消
```

blinks selecting part

AZ-A AZ-B AZ-C AZ-D

Use keys to set display value to output +10V to CH-A analog output

FUNC press and determine

```
3 A.10V SCL
+01000
      ESC:戻る
```

AZ-D press 1 time

```
4 A.0V ADJ
+000
      ESC:戻る
```

CH-A
0V output fine adjustment

AZ-B press 1 time

```
4 A.0V ADJ
-+000-
      ESC:取消
```

blinks selecting part

AZ-A AZ-B

Use keys to adjust output 0V of CH-A analog output

to next page

FUNC press and determine

```
4 A.0V ADJ
+100
        ESC:戻る
```

AZ-D press 1 time

```
5 A.+10V ADJ
+000
        ESC:戻る
```

CH-A
+10V output fine adjustment

AZ-B press 1 time

```
5 A.+10V ADJ
+000
        ESC:取消
```

blinks selecting part

AZ-A AZ-B

Use keys to adjust output 0V of CH-A analog output

FUNC press and determine

```
5 A.+10V ADJ
+010
        ESC:戻る
```

AZ-D press 1 time

```
6 A.-10V ADJ
+000
        ESC:戻る
```

CH-A
-10V output fine adjustment

AZ-B press 1 time

```
6 A.-10V ADJ
+000
        ESC:戻る
```

blinks selecting part

AZ-A AZ-B

Use keys to adjust output -10V of CH-A analog output

FUNC press and determine

```
6 A.-10V ADJ
+006
        ESC:取消
```

AZ-D press 1 time

```
7 B.V SEL
NET
        ESC:戻る
```

CH-B
Output data selection

Perform the same operation as the setting
「1 A.V SEL」to「6 A.-10V ADJ」
A same procedure for CH-C,CH-D

Press AZ-D to the below screen

```
13 C.V SEL
NET
        ESC:戻る
```

CH-C
Output data selection

Perform the same operation as the setting
「1 A.V SEL」to「6 A.-10V ADJ」
A same procedure for CH-C,CH-D

Press AZ-D to the below screen appears

```
25 B.0V SCL
+00000
        ESC:戻る
```

TOTAL
Output data selection

Perform the same operation as the setting
「7 A.0V SCL」to「6 A.-10V ADJ」

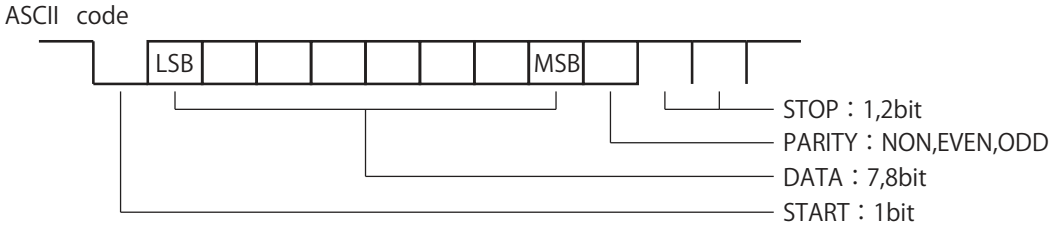
Press ESC return to the below screen

```
項目選択
4 アナログ出力
        ESC:戻る
```

4-2. RS-232C Serial data communication

This serial data interface conforms to the RS-232C standard and supports half-duplex bidirectional communication.

・Communication protocol



・Communication format

1	2	3	4	5	6	7	8	9	10	11	12
Header		,	TOTAL data							CR	LF

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
C	1	,	Header		,	CH-A data							CR	LF

28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
C	2	,	Header		,	CH-B data							CR	LF

43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
C	3	,	Header		,	CH-C data							CR	LF

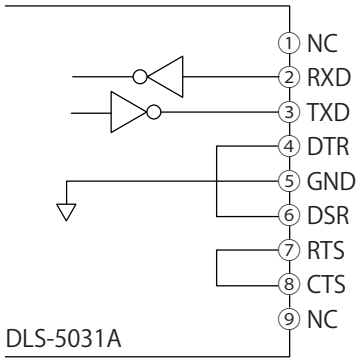
58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
C	4	,	Header		,	CH-D data							CR	LF

Terminate：CR=ODH, LF=OAH

	Header	
Noarmal	W	T
Exceeded	O	L

	Data						
w/o decimal point	±	0	1	2	3	4	5
w/ decimal point	±	1	2	3	4	.	5
Exceeded	±	9	9	9	9	.	9

・I/F Circuit



・Communication command

Transmission command	Response	Number of digit	Function	Remarks
REQ	WT,+###### C1,WT,+###### C2,WT,+###### C3,WT,+###### C4,WT,+######	6	Data transmission request	
C□,REQ	C□,WT,+######	6	Data transmission request of □ch	□=0 ～ 4
DAZ	←	-	Tare off all Ch.	
TRE	←	-		
AZR	←	-	Cancel tare off all Ch.	
TRC	←	-		
C□,DAZ	←	-	Tare off □ch	□=1 ～ 4
C□,TRE	←	-		
C□,AZR	←	-	Cancel tare off of □ch	□=1 ～ 4
C□,TRC	←	-		
C□,PTR	C□,PTR,+######	6	Preset of □ch Request transmission of tare off value	□=1 ～ 4
C□,PTR,+######	←	6	Preset of □ch Tare off setting	□=1 ～ 4 Ignore decimal point input
SPn	SPn,+######	6	Request for transmission of quantitative value of comparator n.	n=1 ～ 8
SPn,+######	←	6	Setting of quantitative value of comparator	n=1 ～ 8 Ignore decimal point input
HYn	HYn,+######	6	Transmission request of Hysteresis n	n=1 ～ 8
HYn,+######	←	6	Set Hysteresis n	n=1 ～ 8 Ignore decimal point input
DYn	DYn,+######	6	Transmission request of delay time n	n=1 ～ 8
DYn,+000###	←	6	Setting delaytime n	n=1 ～ 8 Ignore decimal point input Only the lower 3 digits are valide
Add terminal <CR> <LF> at the end of each command. □ch specification : 0= calculation value, 1 = Ach, 2 = Bch, 3 = C ch, 4 = D ch. ###### number of digits are digits including decimal point (小With decimal point " 1234.5" w/o decimal point "012345") . Mistakes are ignored when entering numerical values for commands, and decimal points are attached when sending data.				

・Error correspondense

Correspondese	Contents	Remarks
ERR-01	Abnormal memory or saving error	Failure to writh to non-volatile memrory
ERR-02	Execution impossible	Tare off during over display
ERR-05	Format abnormaly	Undefined command, number digit difference
Lit terminator <CR><LF> at end of correspondense		

5. Function mode

5-1. Operating method

Basic step

- FUNC press 1 second to Function mode
- AZ-A AZ-B Major classification
- AZ-C AZ-D Minor classification
- AZ-A AZ-B Select Digit and Candidate
- AZ-C AZ-D Change selected digit at mumerical digit
- FUNC Determined
- ESC Return to the main screen

5-2. Setting contents

1 Select function

Guide display	Items	Setting value	Movement
1 Pre風袋値A +00000 ESC:戻る	Preset Ach Setting tare off value	0 ～ 99999	Numeric value setting 0 at the time of shipment
2 Pre風袋値B +00000 ESC:戻る	Preset Bch Setting tare off value	0 ～ 99999	Numeric value setting 0 at the time of shipment
3 Pre風袋値C +00000 ESC:戻る	Preset Cch Setting tare off value	0 ～ 99999	Numeric value setting 0 at the time of shipment
4 Pre風袋値D +00000 ESC:戻る	Preset Dch Setting tare off value	0 ～ 99999	Numeric value setting 0 at the time of shipment
5 ネット演算 プリセット風袋引 ESC:戻る	Select Net calculation	Preset tare off	Preset tare off at the time of shipment
		Net calculation	Net calculation
6 ホールド動作 サンプル ESC:戻る	Select hold motion	Sample	Sample hold at the time of shipment
		Maximum value	Peak hold
		Minimum value	Bottom hold
7 TOTAL表示 A+B+C+D ESC:戻る	Select TOTAL display	A+B+C+D A+B+C-D A+B-C-D A-B-C-D	Ach+Bch+Cch+Dch Ach+Bch+Cch-Dch Ach+Bch-Cch-Dch Ach-Bch-Cch-Dch at the time of shipment

項目選択
2 コンパレータ
ESC:戻る

2 Comparator

Guide Display	Item	Setting value	Motion
1 SP1 定量値 +99999 ESC:戻る	Comparator 1 ～ 8 Quantitative vlaue	-99999 ～ 99999	Numerical value setting at the factory setting 99999, -99999
2 SP2 定量値 -99999 ESC:戻る			
3 SP3 定量値 +99999 ESC:戻る			
4 SP4 定量値 -99999 ESC:戻る			
5 SP5 定量値 +99999 ESC:戻る			
6 SP6 定量値 -99999 ESC:戻る			
7 SP7 定量値 +99999 ESC:戻る			
8 SP8 定量値 -99999 ESC:戻る			
9 SP1 HYS 00000 ESC:戻る	Comparator 1 ～ 8 Hysteresis	0 ～ 99999	Numerical value setting at the factory setting 0
10 SP2 HYS 00000 ESC:戻る			

22 SP6 遅延 0.00 秒 ESC:戻る	Comparator Motion delay	0.00 ～ 9.99	Numerical value setting at the factory setting 0
23 SP7 遅延 0.00 秒 ESC:戻る			
24 SP8 遅延 0.00 秒 ESC:戻る			
25 SP1 動作 Aネット上限 ESC:戻る	Comparator Mode selection	Not assigned	Do not output
		A Net Upper limit	Upper limit of Net amount of A ch. SP1 at the time of shipment
		A Net Lower limit	Lower limit of of Net amount of Ach SP2 出at the time shipment
26 SP2 動作 Aネット下限 ESC:戻る		Gross A upper limit	
		Gross A lower limit	Down limit of gross amount of Ach.
27 SP3 動作 Bネット上限 ESC:戻る		B Net upper limit	Upper limit of Net value of B ch. SP3 at the shippment
		B Net lower limit	Lower limit of Net value of B ch SP4 at the shipment
28 SP4 動作 Bネット下限 ESC:戻る		B Gross upper limit	Upper limit of gross value of B ch
		B Gross lower limit	Lower limit of gross value of B ch
29 SP5 動作 Cネット上限 ESC:戻る		C Net upper limit	Upper limit of Net value of C ch. SP5 at the shipment
		C Net lower limit	Lower limit of Net value of C ch SP6 at the shipment
30 SP6 動作 Cネット下限 ESC:戻る		C Gross upper limit	Upper limit of gross value of C ch
		C Gross lower limit	Lower limit of gross value of C ch
31 SP7 動作 Dネット上限 ESC:戻る		D Net upper limit	Upper limit of net value of D ch SP7 at the shipment
		D Net lower limit	Lower limit of net value of D ch SP8 at the shipment
32 SP8 動作 Dネット下限 ESC:戻る		D Gross upper limit	Upper limit of gross of D ch
		D Gross lower limit	Lower limit of gross of D ch
		TOTAL Upper limit	Upper limit of calculation value
		TOTAL Lower limit	Lower limit of calculation value
		Abnormaly detect	On output during normal operation

11 SP3 HYS 00000 ESC:戻る	Comparator Hysteresis	0 ～ 99999	Numerical setting at the shipment 0
12 SP4 HYS 00000 ESC:戻る			
13 SP5 HYS 00000 ESC:戻る			
14 SP6 HYS 00000 ESC:戻る			
15 SP7 HYS 00000 ESC:戻る			
16 SP8 HYS 00000 ESC:戻る			
17 SP1 遅延 0.00 秒 ESC:戻る	Comparator Motion delay	0.0 ～ 9.99	Numerical setting at the shipment 0
18 SP2 遅延 0.00 秒 ESC:戻る			
19 SP3 遅延 0.00 秒 ESC:戻る			
20 SP4 遅延 0.00 秒 ESC:戻る			
21 SP5 遅延 0.00 秒 ESC:戻る			

項目選択
3 外部指令入力
ESC:戻る

3 External com

Guide display	Items	Setting value	Movement
1 外部入力1動作 AZ-A ESC:戻る	External command input 1 ～ 8 Select movement	Not assigned	No operation
		AZ-A	Ach Tare off IN1 at the shipment
2 外部入力2動作 AZR-A ESC:戻る		AZ-B	Bch Tare off IN3 at the shipment
		AZ-C	Cch Tare off IN5 at the shipment
3 外部入力3動作 AZ-B ESC:戻る		AZ-D	Dch Tare off IN7 at the shipment
		AZ-TOTAL	Cancel all chs tare off
4 外部入力4動作 AZR-B ESC:戻る		AZ.R-A	Cancel Ach tare off at teh shipment
		AZ.R-B	Cancel Bch tare off IN4 at the shipment
5 外部入力5動作 AZ-C ESC:戻る		AZ.R-C	Cancel Cch tare off IN6 at the shipment
		AZ.R-D	Cancel Dch tare off IN8 at the shipment
6 外部入力6動作 AZR-C ESC:戻る		AZ.R-TOTAL	Cancel all chs tare off
		HOLD	Hold operation (Hold between Low level)
7 外部入力7動作 AZ-D ESC:戻る			
8 外部入力8動作 HOLD ESC:戻る			

項目選択 4 アナログ出力 ESC:戻る	4 Analog output（OP-1：4～20mA）		
Guide display	Items	Setting value	Movement
1 A.I SEL NET ESC:戻る	CH-A Out put data	NET	Output net amount at the shipment
		GROSS	Output gross amount
2 A.4mA SCL +00000 ESC:戻る	CH-A Output value 4mA	-99999～99999	Setting numerical value at the shipment 0
3 A.20mA SCL +10000 ESC:戻る	CH-A Out put value 20mA	-99999～99999	Setting numerical value at the shipment 10000
4 A.4mA ADJ +000 ESC:戻る	CH-A Fine adjustment of 4mA output	-999～999	Select candidate at the shipment 0
5 A.20mA ADJ +000 ESC:戻る	CH-A Fine adjustment of 20mA output	-999～999	Select candidate at the shipment 0
6 B.I SEL NET ESC:戻る	CH-B Output data	NET	Output Net value at the shipment 0
		GROSS	Output gross value
7 B.4mA SCL +00000 ESC:戻る	CH-B Output value 4mA	-99999～99999	Setting numerical value at the shipment 10000
8 B.20mA SCL +10000 ESC:戻る	CH-B Output value 20mA	-99999～99999	Setting numerical value at the shipment 10000
9 B.4mA ADJ +000 ESC:戻る	CH-B Fine adjustment of 4mA output	-999～999	Select candidate at the shipment 0
10 B.20mA ADJ +000 ESC:戻る	CH-B Fine adjustment of 20mA output	-999～999	Select candidate at the shipment 0

11 C.I SEL NET ESC:戻る	CH-C Output data	NET	Output net value
		GROSS	Output gross value
12 C.4mA SCL +00000 ESC:戻る	CH-C Output value 4mA	-99999 ～ 99999	Numerical value setting at the shipment 0
13 C.20mA SCL +10000 ESC:戻る	CH-C Output value 20mA	-99999 ～ 99999	Numerical value setting at the shipment 10000
14 C.4mA ADJ +000 ESC:戻る	CH-C Fine adjustment of 4mA output	-999 ～ 999	Select candidate at the shipment 0
15 C.20mA ADJ +000 ESC:戻る	CH-C Fine adjustment of 20mA output	-999 ～ 999	Select candidate at the shipment 0
16 D.I SEL NET ESC:戻る	CH-D Output data	NET	Output net value
		GROSS	Output gross value
17 D.4mA SCL +00000 ESC:戻る	CH-D Output vlue of 4mA	-99999 ～ 99999	Numerical value setting at the shipment 0
18 D.20mA SCL +10000 ESC:戻る	CH-D Output value of 20mA	-99999 ～ 99999	Numerical value setting at the shipment 10000
19 D.4mA ADJ +000 ESC:戻る	CH-D Fine adjustment of 4mA output	-999 ～ 999	Select candidate at the shipment 0
20 D.20mA ADJ +000 ESC:戻る	CH-D Fine adjustment of 20mA output	-999 ～ 999	Select candidate at the shipment 0

21 T.4mA SCL +00000 ESC:戻る	TOTAL Ouput value 4mA	-99999 ～ 99999	Numerica value setting at the shipment 0
22 T.20mA SCL +10000 ESC:戻る	TOTAL Output value 20mA	-99999 ～ 99999	Numerical value setting at the shipment 10000
23 T.4mA ADJ +000 ESC:戻る	TOTAL Fine adjustment of 4mA output	-999 ～ 999	Select candidate at the shipment 0
24 T.20mA ADJ +000 ESC:戻る	TOTAL Fine adjustment of 20mA output	-999 ～ 999	Select candidate at the shipment 0

項目選択 4 アナログ出力 ESC:戻る	4 Analog output（OP-2：0 ～ ±10V）		
Guide display	Items	Setting value	Movement
1 A.V SEL NET ESC:戻る	CH-A Output data	NET	Output net value at the shipment
		GROSS	Output gross value
2 A.0V SCL 0 ESC:戻る	CH-A Value to output 0V	-99999 ～ 99999	Numerical value setting at the shipment
3 A.10V SCL +10000 ESC:戻る	CH-A Value to output 10V	-99999 ～ 99999	Numerical value setting at the shipment 10000
4 A.0V ADJ +000 ESC:戻る	CH-A Fine adjustment of 0V	-999 ～ 999	Select candidate at the shipment 0
5 A.+10V ADJ +000 ESC:戻る	CH-A Fine adjustment of 10V	-999 ～ 999	Select candidate at the shipment 0
6 A.-10V ADJ +000 ESC:戻る	CH-A Fine adjustment of -10V	-999 ～ 999	Select candidate at the shipment 0
7 B.V SEL NET ESC:戻る	CH-B Output data	NET	Output net value at the shipment
		GROSS	Output gross value
8 B.0V SCL 0 ESC:戻る	CH-B Value to output 0V	-99999 ～ 99999	Numeric value setting at the shipment 0
9 B.10V SCL +10000 ESC:戻る	CH-B Value to output 10V	-99999 ～ 99999	Numeric value setting at the shipment 10000
10 B.0V ADJ +000 ESC:戻る	CH-B Fine adjustment of 0V	-999 ～ 999	Select candidate at the shipment 0

11 B.+10V ADJ +000 ESC:戻る	CH-B Fine adjustment of 10V	-999 ～ 999	Select candidate at the shipment 0
12 B.-10V ADJ +000 ESC:戻る	CH-B Fine adjustment of -10V output	-999 ～ 999	Select candidate at the shipment 0
13 C.V.SEL NET ESC:戻る	CH-C Output data	NET	Output net value
		GROSS	Output gross value
14 C.0V SCL +00000 ESC:戻る	CH-C Value to output 0V	-99999 ～ 99999	Nuemrical value setting at the shipment 0
15 C.10V SCL +000 ESC:戻る	CH-C Value to output 10V	-99999 ～ 99999	Numerical value setting at the shipment 10000
16 C.0V ADJ 000 ESC:戻る	CH-C Fine adjustment of 0V output	-999 ～ 999	Select candidate at the shipment 0
17 C.+10V ADJ +000 ESC:戻る	CH-C Fine adjustment of 10V output	-999 ～ 999	Select candidate at the shipment 0
18 C.-10V ADJ +000 ESC:戻る	CH-C Fine adjustment of -10V output	-999 ～ 999	Select candidate at the shipment 0

19 D.V.SEL NET ESC:戻る	CH-D Output data	NET	Output net value
		GROSS	Output gross value
20 D.0V SCL +00000 ESC:戻る	CH-D Value to outpu 0V	-99999 ～ 99999	Numeric value setting at the shipment 0
21 D.10V SCL +10000 ESC:戻る	CH-D Value to 10V output	-99999 ～ 99999	Numeric value setting at the shipment 10000
22 D.0V ADJ +000 ESC:戻る	CH-D Fine adjustment of 0V output	-999 ～ 999	Select candidate at the shipment 0
23 D.+10V ADJ +000 ESC:戻る	CH-D Fine adjustment of 10V output	-999 ～ 999	Select candidate at the shipment 0
24 D.−10V ADJ +000 ESC:戻る	CH-D Fine adjustment of -10V output	-999 ～ 999	Select candidate at the shipment 0
25 T.0V SCL +00000 ESC:戻る	TOTAL Value to output 0V	-99999 ～ 99999	Numeric value setting at the shipment 0
26 T.10V SCL +10000 ESC:戻る	TOTAL Value to output 10V	-99999 ～ 99999	Numeric value setting at the shipment 10000
27 T.0V ADJ +000 ESC:戻る	TOTAL Fine adjustment of 0V output	-999 ～ 999	Select candidate at the shipment 0
28 T.+10V ADJ +000 ESC:戻る	TOTAL Fine adjustment of 10V output	-999 ～ 999	Select candidate at the shipment 0
29 T.−10V ADJ +000 ESC:戻る	TOTAL Fine adjustment of -10V output	-999 ～ 999	Select candidate at the shipment 0

項目選択
5 通信設定
ESC:戻る

5 Communication setting（RS-232C）

Guide display	Items	Setting value	Movement
1 通信動作 常時送信 ESC:戻る	Communication operation	Regular transmission	Regular output at the shipment
		Bidirection communication	I/O by command communication
2 出力データ NET ESC:戻る	Output data	NET	Net value per ch＋Calculation value at the shipment
		GRS	Gross value per ch ＋Calculation value
3 通信速度 2400bps ESC:戻る	Baud rate	2400	2400bps at the shipment
		4800	4800bps
		9600	9600bps
		19200	19200bps
4 プロトコル 7bit,even,2bit ESC:戻る	Communication protocol		7bit , No parity, 1stop bit
		7bit,even,1bit	7bit , Even parity,1stop bit
		7bit,odd,1bit	7bit , Odd parity,1stop bit
		8bit,none,1bit	8bit , No parity, 1stop bit
		8bit,even,1bit	8bit , Even parity,1stop bit
		8bit,odd,1bit	8bit , Odd parity,1stop bit
		7bit,none,2bit	7bit , No parity, 2stop bit
		7bit,even,2bit	7bit , Even parity,2stop bit
		7bit,odd,2bit	7bit , Odd parity,2stop bit at the shipment
		8bit,none,2bit	8bit , No parity, 2stop bit
		8bit,even,2bit	8bit , Even parity,2stop bit
		8bit,odd,2bit	8bit , Odd parity,2stop bit

項目選択
6 計量動作設定
ESC:戻る

6 Weighing operation setting

Guide display	Items	Setting value	Movement
1 表示単位 kg ESC:戻る	Unit display	No unit	No unit indiation
		g	Gram
		kg	Kilogram at the shipment
		t	Ton
		N	Newton
		kN	Kilonewton
		N・m	Newton・Meter
		kN・m	Kilonewton・Meter
		Pa	Pascal
		kPa	Kilopascal
		MPa	Megapascal
		mm	Millimeter
		%	Percent
		mV/V	Millivolt・Pervolt
		μ ε	Micro strain
2 小数点位置 0 ESC:戻る	小数点位置	0	No decimal point at the shipment
		0.0	1 digit after the decimal point
		0.00	2 digit after the decimal point
		0.000	3 digit after the decimal point
		0.0000	4 digit after the decimal point
3 最小目盛 1 ESC:戻る	最小目盛	1	Minimum memor 1 at the shipment
		2	Minimum memory 2
		5	Minimum memory 5
		10	Minimum memory 10
		20	Minimum memory 20
		50	Minimum memory 50
		100	Minimum memory 100

項目選択
7 CH-A設定
ESC:戻る

7 CH-A setting

Guide display	Items	Setting value	Movement
1 フィルタ条件 CH-A OFF ESC:戻る	Condition to apply moving average	OFF	Normal moving average at the shipment
		5d	Moving average within ±5 divisions
		10d	Moving average within ±10 divisions
		20d	Moving average within ±20 divisions
		50d	Moving average within ±50 divisions
		100d	Moving average within ±100 divisions
		200d	Moving average within ±200 divisions
		500d	Moving average within ±500 divisions
2 フィルタ強度 CH-A 32t ESC:戻る	Moving average of number of times	1t	1 time
		4t	4 times
		8t	8 times
		16t	16 times
		32t	32 times at the shipment
		64t	64 times
		128t	128 times
		256t	256 times
3 ZT動作条件 CH-A OFF ESC:戻る	Zero tracking operation condiditon	OFF	Zero tracking disabled at the shipment
		1d	Within ±1 scale
		2d	Within ±2 scale
		3d	Within ±3 scale
		4d	Within ±4 scale
		5d	Within ±5 scale
		10d	Within ±1 0 scale
4 ZT動作条件 CH-A 1.0s ESC:戻る	Zero tracking operation time	0.02s	0.02 sec
		0.1s	0.1 sec
		0.5s	0.5 sec
		1.0s	1 sec at the shipment
		2.0s	2 sec
		3.0s	3 sec
5 最大表示 CH-A +99999 ESC:戻る	Maximum display	0 ～ 99999	Numeric values setting at the shipment 99999

項目選択
8 CH-B設定
ESC:戻る

8 CH-B setting

Guide display	Items	Setting value	Movement
1 フィルタ条件 CH-B OFF ESC:戻る	Condition to apply moving average	OFF	Normal moving average at the shipment
		5d	Moving average within ±5 scales
		10d	Moving average within±10 scales
		20d	Moving average within±20 scales
		50d	Moving average within ±50 scales
		100d	Moving average within±100 scales
		200d	Moving average within±200 scales
		500d	Moving average within ±500 scales
2 フィルタ強度 CH-B 32t ESC:戻る	Moving average of number of times	1t	1 time
		4t	4 times
		8t	8 times
		16t	16 times
		32t	32 times at the shipment
		64t	64 times
		128t	128 times
		256t	256 times
3 ZT動作条件 CH-B OFF ESC:戻る	Zero tracking operation condiditon	OFF	Zero tracking disable at the shipment
		1d	Within ±1 scale
		2d	Within ±2 scale
		3d	Within ±3 scale
		4d	Within ±4 scale
		5d	Within ±5 scale
		10d	Within ±10 scale
4 ZT動作条件 CH-B 1.0s ESC:戻る	Zero tracking operation time	0.02s	0.02 sec
		0.1s	0.1 sec
		0.5s	0.5 sec
		1.0s	1 sec at the shipment
		2.0s	2 sec
		3.0s	3 sec
5 最大表示 CH-B +99999 ESC:戻る	Maximum display	0 ～ 99999	Numeric values setting at the shipment 99999

項目選択
9 CH-C設定
ESC:戻る

9 CH-C setting

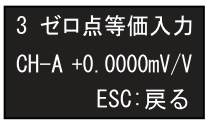
Guide display	Items	Setting value	Movement
1 フィルタ条件 CH-C OFF ESC:戻る	Condition to apply moving average	OFF	Normal moving average at the shipment
		5d	Moving average within ±5 scales
		10d	Moving average within±10 scales
		20d	Moving average within±20 scales
		50d	Moving average within ±50 scales
		100d	Moving average within±100 scales
		200d	Moving average within±200 scales
		500d	Moving average within ±500 scales
2 フィルタ強度 CH-B 32t ESC:戻る	Moving average of number of times	1t	1 time
		4t	4 times
		8t	8 times
		16t	16 times
		32t	32 times at the shipment
		64t	64 times
		128t	128 times
		256t	256 times
3 ZT動作条件 CH-C OFF ESC:戻る	Zero tracking operation condiditon	OFF	Zero tracking disable at the shipment
		1d	Within ±1 scale
		2d	Within ±2 scale
		3d	Within ±3 scale
		4d	Within ±4 scale
		5d	Within ±5 scale
		10d	Within ±10 scale
4 ZT動作条件 CH-C 1.0s ESC:戻る	Zero tracking operation time	0.02s	0.02 sec
		0.1s	0.1 sec
		0.5s	0.5 sec
		1.0s	1 sec at the shipment
		2.0s	2 sec
		3.0s	3 sec
5 最大表示 CH-C +99999 ESC:戻る	Maximum display	0 ～ 99999	Numeric values setting at the shipment 99999

項目選択
10 CH-D設定
ESC:戻る

10 CH-D setting

Guide display	Items	Setting value	Movement
1 フィルタ条件 CH-D OFF ESC:戻る	Condition to apply moving average	OFF	Normal moving average at the shipment
		5d	Moving average within ±5 scales
		10d	Moving average within±10 scales
		20d	Moving average within±20 scales
		50d	Moving average within ±50 scales
		100d	Moving average within±100 scales
		200d	Moving average within±200 scales
		500d	Moving average within ±500 scales
2 フィルタ強度 CH-D 32t ESC:戻る	Moving average of number of times	1t	1 time
		4t	4 times
		8t	8 times
		16t	16 times
		32t	32 times at the shipment
		64t	64 times
		128t	128 times
		256t	256 times
3 ZT動作条件 CH-D OFF ESC:戻る	Zero tracking operation condiditon	OFF	Zero tracking disable at the shipment
		1d	Within ±1 scale
		2d	Within ±2 scale
		3d	Within ±3 scale
		4d	Within ±4 scale
		5d	Within ±5 scale
		10d	Within ±10 scale
4 ZT動作条件 CH-D 1.0s ESC:戻る	Zero tracking operation time	0.02s	0.02 sec
		0.1s	0.1 sec
		0.5s	0.5 sec
		1.0s	1 sec at the shipment
		2.0s	2 sec
		3.0s	3 sec
5 最大表示 CH-D +99999 ESC:戻る	Maximum display	0 ～ 99999	Numeric values setting at the shipment 99999

11 CH-A Clibration

Guide display	Items	Setting value	Movement
	Zero actual load calibration	0	Setting value “0” fixed
	Span 1 actual load calibration	-99999 ～ 99999	Numerical value setting at the shipment 10000
	Zero point sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 0.0000
	Span 1 calibration value	-99999 ～ +99999	Numerical value setting at the shipment 10000
	Span 1 sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 1.0000

項目選択
12 CH-B校正
ESC:戻る

12 CH-B Calibration

Guide display	Items	Setting value	Movement
1 ゼロ点校正 CH-B +00000 0.0176mV/V ESC:戻る	Zero actual load calibration	0	Setting value “0” fixed
2 SPAN1校正 CH-B +10000 0.0176mV/V ESC:戻る	Span 1 actual load calibration	-99999 ～ 99999	Numerical value setting at the shipment 10000
3 ゼロ点等価入力 CH-B +0.0000mV/V ESC:戻る	Zero point sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 0.0000
4 SPAN1等価表示 CH-B +10000 ESC:戻る	Span 1 calibration value	-99999 ～ +99999	Numerical value setting at the shipment 10000
5 SPAN1等価入力 CH-B +1.0000mV/V ESC:戻る	Span 1 sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 1.0000

項目選択
13 CH-C校正
ESC:戻る

13 CH-C Calibration

Guide display	Items	Setting value	Movement
1 ゼロ点校正 CH-C +00000 0.0176mV/V ESC:戻る	Zero actual load calibration	0	Setting value “0” fixed
2 SPAN1校正 CH-C +10000 0.0176mV/V ESC:戻る	Span 1 actual load calibration	-99999 ～ 99999	Numerical value setting at the shipment 10000
3 ゼロ点等価入力 CH-C +0.0000mV/V ESC:戻る	Zero point sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 0.0000
4 SPAN1等価表示 CH-C +10000 ESC:戻る	Span 1 calibration value	-99999 ～ +99999	Numerical value setting at the shipment 10000
5 SPAN1等価入力 CH-C +1.0000mV/V ESC:戻る	Span 1 sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 1.0000

項目選択
14 CH-D校正
ESC:戻る

14 CH-D Calibration

Guide display	Items	Setting value	Movement
1 ゼロ点校正 CH-D +00000 0.0176mV/V ESC:戻る	Zero actual load calibration	0	Setting value “0” fixed
2 SPAN1校正 CH-D +10000 0.0176mV/V ESC:戻る	Span 1 actual load calibration	-99999 ～ 99999	Numerical value setting at the shipment 10000
3 ゼロ点等価入力 CH-D +0.0000mV/V ESC:戻る	Zero point sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 0.0000
4 SPAN1等価表示 CH-D +10000 ESC:戻る	Span 1 calibration value	-99999 ～ +99999	Numerical value setting at the shipment 10000
5 SPAN1等価入力 CH-D +1.0000mV/V ESC:戻る	Span 1 sensor input value	-3.0000 ～ 3.0000	Numerical value setting（mV/V） at the shipment 1.0000

項目選択
15 テストモード
ESC:戻る

15 Test mode

Guide display	Items	Setting value	Movement
項目選択 15 テストモード ESC:戻る	Test mode		FUNC 3 consecutive presses

6. Test mode

6-1. Preparation before calibration

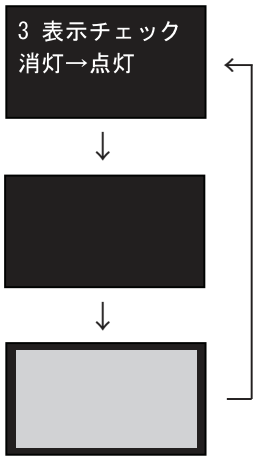
Basic step

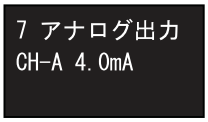
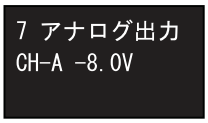
- Press the FUNC key 3 times while the power is ON or 項目選択 / 15 テストモード / ESC:戻る is displayed
- AZ-C ▼ AZ-D ▲ select item AZ-A ◀ AZ-B ▶ select mode
- In the screen of 10 再起動 / リセット ON press FUNC return to the main screen

6-2. Setting contents

項目選択
15 テストモード

15 Test mode

Guide display	Item	Contents
1 機種表示 DLS5031A	Model display	
2 プログラムVer P-1.13	Program version display	
3 表示チェック 消灯→点灯	Lighiting check of VFD display	Check by using AZ-A ◀ AZ-B ▶ keys 

	Key check	SHIF AZ-R / AZ-A ◀ / AZ-B ▶ / AZ-C ▼ / AZ-D ▲ / ESC / FUNC ↵ Pressed key is displayed ● AZ-D ▲ Press 2 times to next item AZ-C ▼ Press 2 times to previous item
	External command input check	The input turned ON is displayed ● By AZ-D ▲ key, go to next item By AZ-C ▼ key, return to prvious item
	External output check	By AZ-A ◀ AZ-B ▶ keys,change output and display ● By AZ-D ▲ key, got to next item By AZ-C ▼ key, return to previos item
	Current output check ※ When installed OP-1	By AZ-A ◀ AZ-B ▶ keys, output 11 kinds steps 「4.0mA、5.6mA、7.2mA、8.8mA、10.4mA、12.0mA 13.6mA、15.2mA、16.8mA、18.4mA、20.0mA」 By FUNC ↵ key, output channel change By AZ-D ▲ key, to next item By AZ-C ▼ key, return previous item
	Voltage output check ※ When installed OP-2	AZ-A ◀ AZ-B ▶ キイで 11 段階ステップ出力 「-10.0V、-8.0V、-6.0V、-4.0V、-2.0V、0.0、2.0V、4.0V、6.0V、8.0V、10.0V」 By FUNC ↵ key, output channel change By AZ-D ▲ key, to next item By AZ-C ▼ key, return to previous item

8 シリアル通信 PUSH L/R KEY	RS-232C transmission check	Data ourput by AZ-A ◀ or AZ-B ▶ key Data output by REQ command input ※ Fixed with 2400bps, 7bit, even,2stop AZ-D ▲ key to next item AZ-C ▼ key return to previous item
9 センサー入力 CH-A 0.0679mV/V	Load cell input voltage check	AZ-Z ◀ Zero motion AZ-B ▶ Zero cancel FUNC ↵ Input channel change AZ-D ▲ key to next item AZ-C ▼ key return to previous item
10 再起動 リセット OFF	Test mode end	Select operation by AZ-A ◀ or AZ-B ▶ While display 10 再起動 リセット ON ,press FUNC ↵ to finish

7. Trouble shooting

7-1. If you think it might be a malfunction

☞ Check power supply（AC100 ～ 240V）whether normal ?

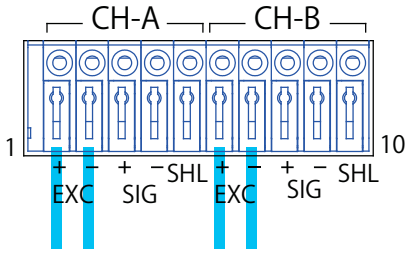
☞ Check wire connection to the terminal block is OK ?

Appears error code when performing Zero calibration	The initial Zero point setting range has been exceeded.	To perform Zero point calibration, it can not be performed unless the sensor output at no load is within the range of -2.8mV/V to +2.8mV/V. If the sensor output at no load exceeds ±2.8mV/V using a sensor whose rated output exceeds 3.3mV/V Please contact us.
Error code appears when span calibratio performing. Display does not become keyed in value.	Sensor output is too big	The measurement can not be performed on a system in which the sum of initial tare value and weighing value exceeds 3.3mV/V. Please consult with us when using a sensor with a raed output of more than 3.3mV/V.
	Span calibration valeu input is small	Span calibration can not be performed if the amount of change in the load cell input is smaller than the weight setting value at span calibration. Increase the minimum scale to make the display resolution coarser, or combine with a suitable load cell.
Display is scattered	Improper span setting for resokution	The input sensitivity is ±0.25 μV /digit, so the maximum display resolution at 1.0mV/V input is 1/2000. If the resolution is higher than this, the variation of the display will be large. Increase the scale setting (scale division) to the extent that the display is not distracting.
Weighing indicator flashes even though it is not overload.	• Sensor cable partially broken • Sensor failure	Check the input status from the sensor in test mode.

7-2. Failure diagnosis method

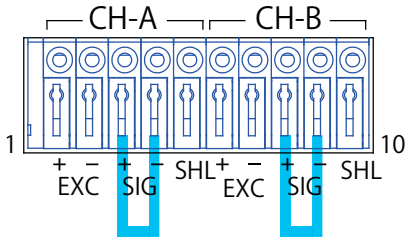
☞ **Check if sensor exciting voltage is normal**

Disconnect the connection between the indicator and the sensor, check if the terminal block #1(+EXC) and #2(-EXC) or #6 and #7 are stable at 5V ±0.5V. If it is not stable, it is judged as a failure.



☞ **Check display stability**

Short the terminal block #3 (+SIG) and #4 (-SIG) or #8 and #9. (Input voltage 0V) display the load cell input voltage (mV/V) in the test mode. Check if the display is stable around 0.0000.
If it is not stable, it failes main body. If it is stable, check whether the sensor is normal.



☞ **Check digital I/O**

Check I/O in test mode

7-3. Checking method whether senosr is normal

☞ **Judging from resistance value**

Measure the load cell bridge resistance with a tester, and check whether there is any abnormality in the I/O resitance value.

☞ **Judging from insulation resistance**

Measure the insulation resistance with a voltage within 50V between the load cell shield wire and teh other wire. It is generally good if the resistance value is 1000MΩ or more.

Note: Please turn off the indicator first and remove the laod cell before checking.

If the above action does not solve the problem, please contact us.
(Please prepare the information such as model, serial number and option)

8. Specification

8-1. A/D Converter

① Transducer input	4ch
② Mnimum input sensitivity	0.25 μV/digit（maximum display resolution 1mV/V input：1/20,000）
③ Nonlinearity	±0.02%FS±1 count
④ Temperature Characteristic	Zero point：±0.005%FS/℃（at input sensitivity 1.0mV/V ）
	Sensitivity：±0.005%Reading/℃
⑤ Frequency characteristic	About 2Hz (at average 32 times)
⑥ Sampling cycle	About 10ms（100 times/sec）ch
⑦ Transducer power	Each ch：DC5V±5%，60mA（4 350Ω type transducers can be connected）

8-2. Display

① Display element	グラGraphic fluorescent display, gree, 128×64 dots
② Weighing value display	Calculated value display：5 digit（±99999）、文Charactor height ≒12mm
	Weighing value A，B，C，D display：5 digits（±99999）, Character height ≒ 6mm
	Operation indication：▼ mark 11 pcs SHIFT, AZ, HOLD, comparator output 1 ～ 8
③ Over display	Flashing weight value
④ Decimal point	Can be set to any digit 0（None），0.0，0.00，0.000，0.0000
⑤ Unit	None, g，kg，t，N，kN，N･m，kN･m，Pa，kPa，MPa，mm，%，
	mV/V, μ ε
⑥ Display update cycle	About 100ms（10 times/sec）

8-3. Zero point・Sensitivity adjustment

① Zero point adjustment	Adjustable with ±2.8mV/V input signal
② Sensitivity adjustment	Adjustable with span of ±0.4mV/V ～ ±3.0mV/V
	※. The sum of initial tare value (zero point iput value) and maximum weighing value (span amoun) must not exceed ±3.3mV/V.
③ Calibration method	Actual load calibration or equivalent input calibration

8-4. I/O

① Operation switch	7 key
	Item selection key：SHIFT，AZ.R
	Operation key：AZ-A，AZ-B，AZ-C，AZ-D（arrow key for setting is compatible）
	Escape key：ESC，Entry key：FUNC/ENT
② External command input	Input signal：8 pcs（8bit 1 comon）
	Non-voltage contact input or open collector input
	（Ic=10mA，withstand pressure more than 20V ）
	Motion：（a）AZ-A ー one shot make contact（pulse width 0.2sec）
	（b）AZ.R-A ー one shot make contact (pulse width 0.2 sec)
	（c）AZ-B ー one shot make contacting（pulse width0.2sec）
	（d）AZ.R-B ー one shot makebtojt (pulse width 0.2sec）
	（e）AZ-C ー one shot maker connecting（pulse width 0.2sec）
	（f）AZ.R-C ー one shot maker connecting(pulse width0.2sec）
	（g）AZ-D ー one one shot make connecting (pules width 0.2sec）
	（h）AZ.R-D ー one shot make connecting (pulse width 0.2sec）
	（i）HOLD ー level control L= hold/H= Cancel

③ Control output	Output signal：8 point（8bit 1 common） Emitter common open collector output（NPN トransistor）
	Power rating：DC30V，50mA（Resistive load） Collector-emitter saturation voltage：1.2V or less Photocouplers isolate the internal circuit
④ Current loop output	Serial data I/F dedicated to our external device connection
⑤ RS-232C	Communication standard：EIA RS-232C compliant, Isolated I/O
	Communication method：Asynchronous(asychronous) type・Half duplex bidirectional
	Communication speed：2400，4800，9600，19200bps
	Communication protocol： Data bit： 7, 8 / Stop bit： 1,2 / Parity ： NON，EVEN，ODD Data： ASCII code
	Communication format：Toyo Sokki exclusive format

8-5. Option

① OP-1【4 ～ 20mA current output】

Output points : 5 lineage (weighing values, A, B, C, D calculated value)
Isolated output
Resolution : Linked to display resolution (Max 1/40,000)
Output range：≒ 0 ～ 24mA
Loading resistance：0 ～ 510Ω
Update cycle：Linked to sampling
Non linearity : ±0.05%FS (for the display value)
Temp. Characteristic：Zero・Sensitivity ±0.02%FS/℃ typ.（for the display value）

② OP-2【0 ～ ±10V voltage output】

Output points : 5 lineage(weighing value A, B, C, D, calculated value)
(isolated output)
Resolution : Linked to display resolution (Max 1/40,000)
Output range：≒ -12 ～ 12V
Loading resistance：5kΩ or more
Update cycle：Linked to sampling
Non linearity : ±0.05% FS (for the display value)
Temp. Characteristic：Zero・Sensitivity ±0.02%FS/℃ typ.（for the display value）

8-6. Overall

① Black out measure	Each setting data is strored in non-volatile memory
② Current / Voltage	AC85 ～ 264V、50/60Hz
③ Current consumption	0.6A typ（AC IN 100V）
	0.4A typ（AC IN 200V）
④ Temp.・Humid. range	-10 ～+40℃、20 ～ 85% R.H.（No condecsation）
⑤ Mounting method	Panel mount type
⑥ Mass	approx. 1.2k

9. Type of view, Accessories

9-1. Model

DLS-5031A-□

Option　Blank：No option
1：4 ～ 20mA（OP-1）
2：0 ～ ±10V voltage output（OP-2）

Product type

※ Only one option can be installed

9-2. Accessories

① Operation manual ：1 set
② Terminal plate cover：1 set
③ 24P connector for input / output signal connection (FCN-361J024 and cover) : 1 set