

Instruction Manual
(Quick manual for installation and specifications)

Reversible Counter Model 472B

I-02379

1. Preface

We thank you for your purchase of our product. For proper use of it, please carefully read these instructions before the initial operation of it. Please ensure that this instruction manual is delivered to the right person who is in charge of using this instrument.

When the product is delivered to you, please check that the following items are provided:

- (1) Model 472B main unit.
- (2) Bracket, 2 pieces.
- (3) Waterproof packings.
- (4) Instruction manual. (this manual)
- (5) Label of units.
- (6) Connector with 2m flat cable. (when provided with BCD output)

Also, please check that the specifications of the delivered product conform to your requirement.

For safe use of this product, please observe the following warning and caution.

In order to help the users' safe use of the products, the following symbol marks are used in this manual.

⚠ WARNING This is the warning to avoid the danger when it is assumed that such danger as may cause fatal accident or severe injury to a user occurs in case that the product is mishandled.

⚠ CAUTION This is the caution to avoid the danger when it is assumed that such danger as may cause minor injury to a user or generate only physical obstacle occurs in case that the product is mishandled.

⚠ WARNING

- **There is no power on-off switch on the model 472B. It immediately starts to operate after turning the power.**
- **Do not touch terminals when turning the power on.**

⚠ CAUTION

Preserve followings for your safety.

- **Use this product indoor.**
 - **The rated data is, however, defines with more than 15 minutes warming-up times.**
 - **When the product is installed in the cabinet, perform the appropriate heat radiation to keep less than 50°C in it.**
 - **Avoid the close-contacted mounting of the meter. The rise of internal temperature affects the life of product.**
 - **Do not install under the following conditions.**
 - **Where it is exposed to direct sunlight, dust, corrosive gases, rain, etc.**
 - **Where ambient temperature or humidity is high.**
 - **Where it is exposed to excessive noise or static electricity.**
 - **Where there is constant vibration or shock**
 - **Store the instrument within the specified temperature range for storage (-20~70°C).**
 - **When the front panel or the case becomes dirty, wipe it with soft cloth.**
- For heavy dirt, wipe it lightly with the soft cloth wetted with the neutral cleaner thinned by water, and finish the cleaning with dry cloth. Do not use organic solvent like benzene or paint thinner as they may deform or discolor the case.**

2. Specifications

2.1 Specifications for installation

Power supply	: AC100V~AC240V 50/60Hz, DC24V, DC110V
Power supply voltage tolerance range	: AC90~250V, DC24V \pm 10%, DC100~170V
Power consumption	: AC100~240V: Approx. 12VA at AC100V, approx. 17VA at AC200V DC24V: Approx. 270mA, DC110V: Approx. 60mA
Operating ambient temperature	: 0~50°C (without dew condensation)
Operating ambient humidity	: 40~85%RH
Storage temperature	: -20~70°C (without dew condensation)
Weight	: Approx. 300g
Mounting method	: From the product's rear side, by dedicated bracket.
Insulation resistance	: DC500V, 100M Ω or more
Withstanding voltage	: Input terminals / Case AC2000V for 1 minute Power source terminals / Case AC2000V for 1 minute Power source terminals / Input terminals AC1500V for 1 minute Input terminals / BCD output AC500V for 1 minute Input terminals / Analog output terminals AC500V for 1 minute
Protection degree	: Front panel operating section IP65 Rear case IP20 Terminal block section IP00

2.2 General specifications

●Performance

Display (LCD)	: Count display, red or green, character height 15.2mm Over range in red, character height 7.6mm With zero suppress function
Display range	: -999999~999999 Display for number of times of over: -99~99 The display is fixed at -999999 or 999999
Decimal point	: Arbitrarily selectable from 10 ¹ , 10 ² or 10 ³ (not remote-controllable)
Over display	: At over: OVER is lit up When the number of times exceeds 99, the over display blinks.
Counting speed	: 120kHz
Display cycle	: Approx. 100ms
Pulse coefficient (m)	: 1 \times 10 ⁻⁶ ~9999
Pulse division ratio (n)	: Number of pulse per rotation 1/1~1/1000
Display value (d)	: Display value = Number of input pulse \times pulse coefficient \times pulse division ratio $d = p \times m \times n$ p = number of input pulse
Display accuracy	: \pm 0 digit at pulse coefficient 1 and pulse division ratio 1
Compensation for blackout	: The totalized value is memorized in non-volatile memory and retained. No count is made during the blackout. The data retaining duration is about 10 years.
Power source line interfusing noise	: 1000V (in case of AC power source)
Sensor power supply	: DC5V \pm 5% 160mA or DC12V \pm 5% 100mA

●Standard input specifications

Differential input	: A phase, B phase Intended connection: Differential line driver (equivalent to AM26LS31) Phase differential: Multiplication by 1, by 2, by 4, selectable by setting
Control input (P/L) ③, ①	: Selection of pause / latch function (make the terminals ③ and ① to L level.) Pause — Count is prohibited Latch — Count is continued, display is retained Active "L", I _{IL} \leq 10mA L=0~6V, H=9~12V Non-isolated with differential input (COM ① and COM ② are common)
Reset terminal ②, ①	: Between the terminals ② and ① (L level input or no voltage contact input) Active "L", I _{IL} \leq 10mA L=0~6V, "H"=9~12V Minimum pulse width 10ms Non-isolated with differential input (COM ① and COM ② are common)

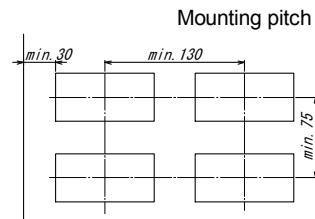
●Option

Comparator output ④, ⑤, ⑥	: AL3~4 photo MOS relay Contact capacity AC/DC150V 80mA AL3 = between ④ and ⑤, AL4 = between ⑥ and ⑤
BCD output B row terminals	: 6 digit open collector output Contact capacity DC30V 10mA Accessory: Mode 5808-05 (with connector on 472B side and 2m flat cable)
Analog output ③ — ⑥	: Following analog outputs are available in open code. DC0~5V, DC0~10V, DC1~5V, DC4~20mA (either one) Accuracy \pm (0.3% of F.S.) at 23°C

3. Installation

3.1 Panel cut-out

Panel cut-out dimension: $92^{+0.8/0} \times 45^{+0.6/0}$ mm
 Allowable panel thickness: 0.6~3.5mm (protection degree IP65)
 3.6~10mm (protection degree IP20)
 Recommended thickness for the panel of aluminum is 1.5mm or more to avoid deformation of the panel.



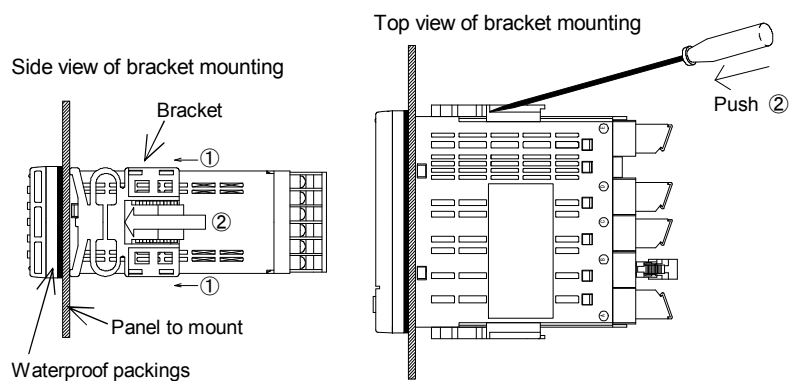
3.2 Mounting and dismounting

• Mounting:

1. Insert the main unit fitted with the waterproof packings into the hole, from the panel front, and insert the attached bracket to the ditch on both sides of the main unit. Push the bracket as shown by arrow ① until the main unit is stably stays and fix the bracket. The packings functions as stopper too, so do not remove it. Refer to the side view of the bracket mounting.
2. To fix the main unit more firm, press the back part (center part) of the bracket indicated by arrow ② by screwdriver, which enhances the stopper strength.

CAUTION

- When pushing by screwdriver, apply it to the arrow ②. The pushing of other part may cause the damage of bracket.

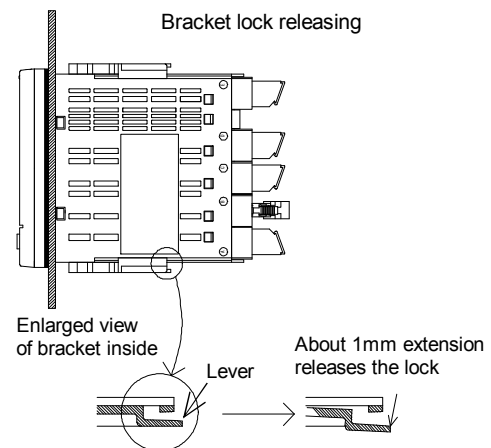


• Dismounting:

1. By extending with fingers the lever outward by about 1mm, as shown in the bracket lock releasing figure, the lever lock can be released.
2. Keep extending the lever outward, slide the bracket backward of the main unit, and remove it from the ditch.

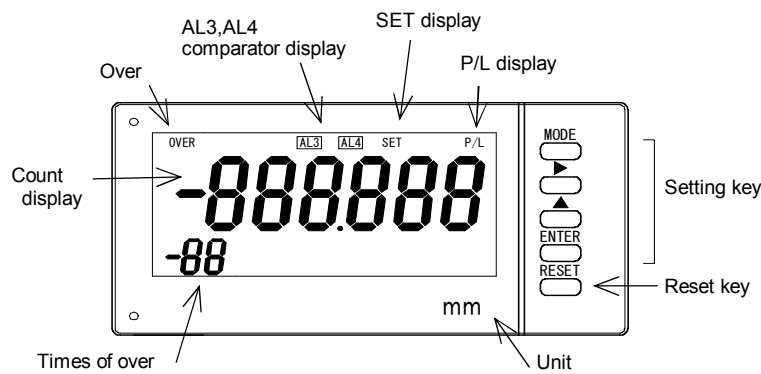
CAUTION

- The extension of the lever for long time or the stress to it by metallic piece like screwdriver may damage the lever.



4. Name of parts

4.1 Front



4.2 Function of setting keys

- | | |
|------------------|---|
| MODE key | In measurement mode : Change-over to setting mode or adjustment mode |
| | In setting mode : Change-over of setting item |
| . key | In measurement mode : Invalid |
| | In setting mode : Selection of digit of set value |
| ▲ key | In measurement mode : Invalid (except at the change-over of self-diagnosis mode) |
| | In setting mode : Change of set value |
| ENTER key | In measurement mode : Invalid |
| | In setting mode : Determining of set value |
| RESET key | In measurement mode : Make the display to "0" (or to initial value when the reset totalizing function is set) |
| | In setting mode : Changes over to measurement mode from setting mode, without memorizing the set value. |

4.3 Rear

About terminal arrangement and wiring

⚠ CAUTION

- Apply the source power voltage and the load within the rated values. Otherwise, it may damage the product.
- Apply the supply voltage so that it can reach the rated value within one second.
- When the power to the product is turned OFF and ON again, provide the downtime of about 10 seconds.
- Do not use the product with wrong wiring, which may cause the breakdown of the product.

⚠ WARNING

- To avoid an electrical shock, turn the power off when wiring.
- Do not wire with moistened hands. Locate away from the wet place.
- Do not touch terminals when turning the power on.

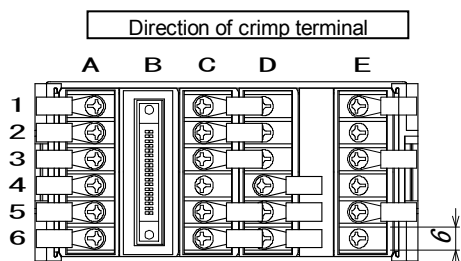
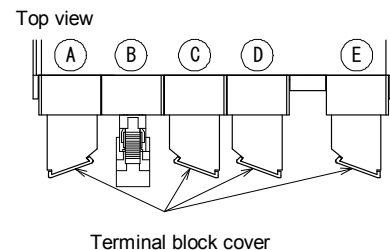
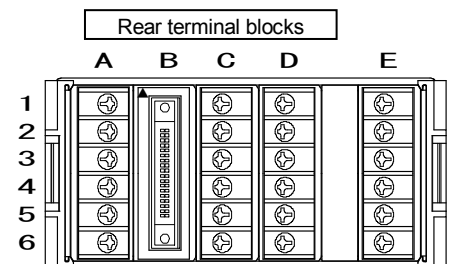
● Other cautions for wiring

- Be sure to wire the input line and source power line independently with each other. If they are wired in parallel, it may case an erroneous count.
- When the auxiliary relay is operated by the relay output to run the electromagnetic switch or big size relay, take the noise preventive measures. In case that the noise is frequently occurred, it will be effective to store the product in the shielded housing or to insert the power source line filter or insulated transformer.

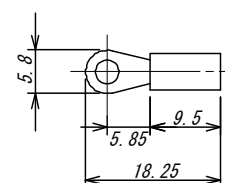
⚠ CAUTION

- For the C row and D row terminal blocks, apply one crimp terminal per one terminal block.
- Do not do the parallel connection, using two crimp terminals (overlying) at the same terminal block. It stresses the internal PCB and so on and may cause the failure or trouble.

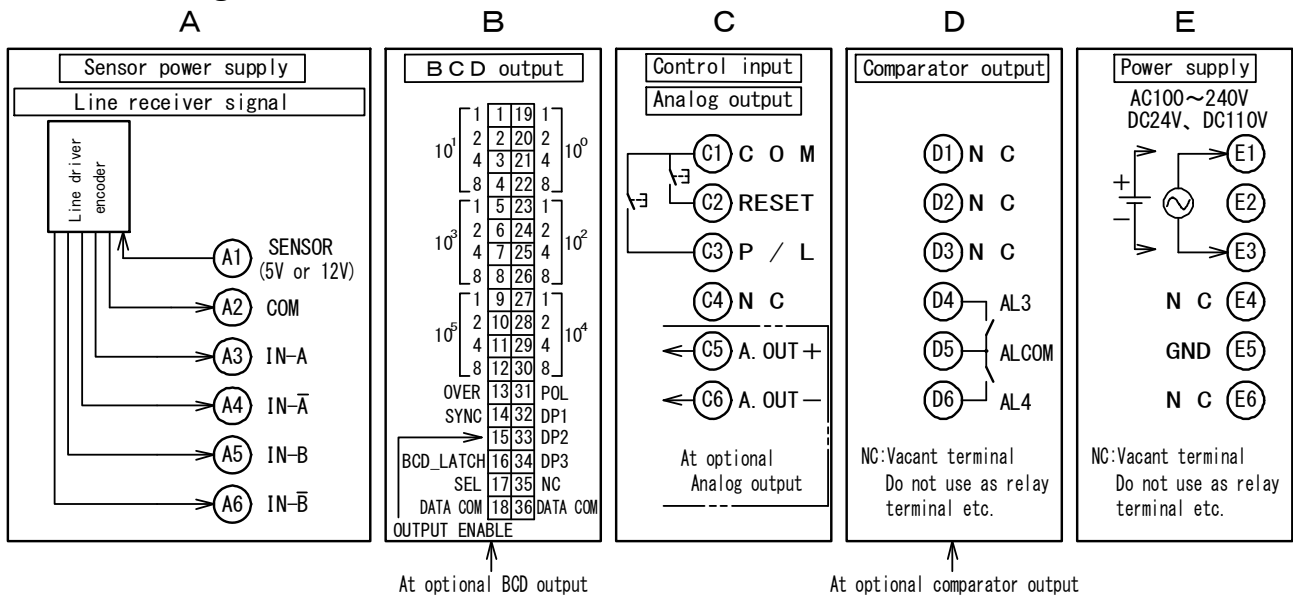
As for the A row and E row terminal blocks, up to two crimp terminals per terminal block are acceptable.



Recommended crimp terminal: V1.25-FS3
 (Made of Fuji Terminal Industry Co.,Ltd)
 Ext. diameter of covered cable: Max. 3.3mm
 Terminal screw: M3



Terminal arrangement

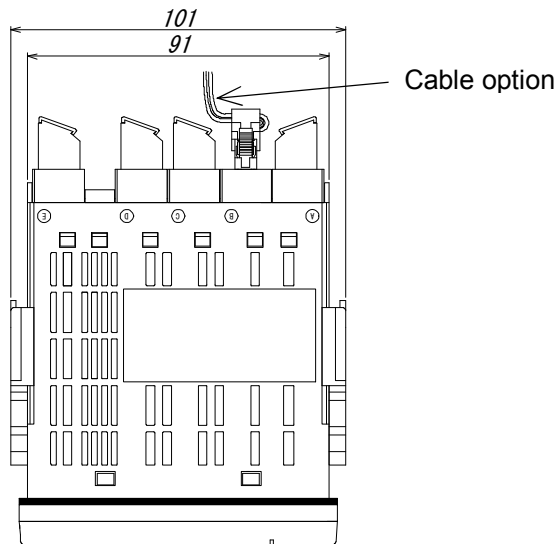


CAUTION

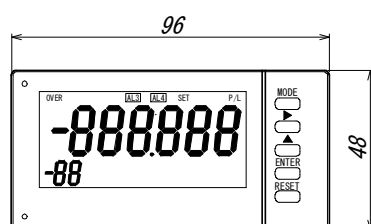
- Short-circuit failure mode of sensor power supply
The erroneous short-circuit between sensor power supply terminal A1 and COM terminal A2 causes the failure mode, due to the abnormal writing, and in that case, the counter value is not warrantable
- GND (ground) terminal
In case of fear that the noise is frequently generated on the power source line, it is effective to earth the ground terminal directly to the ground. If the instrument is not affected by environmental noise, the grounding can be omitted. In this case, take care for the ground terminal not to touch other input terminals, as it is charged with neutral electric potential of power source voltage.

5. Dimensions

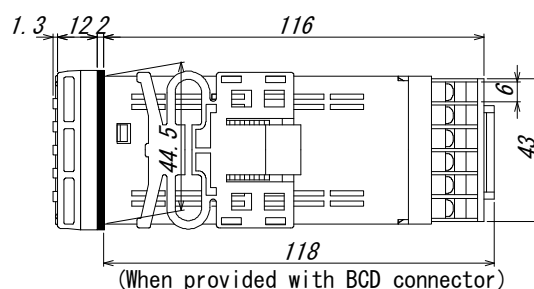
Top view



Front view



Side view



6. Table of explanations of functions and example of setting

● Display functions

Code No.	Function	Display	Adjustable range	Initial setting
00	Key protect	KEY	OFF/ON	OFF
01	Phase differential	CONF.	0, 1, 2 0: Phase differential, multiplication by 1 1: Phase differential, multiplication by 2 2: Phase differential, multiplication by 4	0
03	Decimal point	DP.	0, 0.0, 0.00, 0.000	0
05	Pulse coefficient	PLS.	9999E-0~0001E-6	1E0 (0001E-0)
07	Pulse division ratio	PRD.	1/1~1/1000	1 (1/1)
09	Initial totalizing value	INT.	-999999~999999	0
11	Display color	COL.	Without comparator output function, R, G With comparator output function, RR, RG, GR, GG	G RG
12	Totalizer reset function	TRST	OFF/ON	OFF
14	Action of reset key	PRST	0 (prompt), 1 (1 sec.), 2 (2 sec.), 3 (no RESET)	1
15	Power supply start-up reset	PRST	OFF, ON	OFF
16	Pause / latch	P.L.	0 (pause), 1 (latch)	0
17	Display total turn-off function	TUR.	0 (invalid) / 1 (valid), 0~99 min.	0, 01

Note 1) }
Note 1) }
* R G

Note 1) When the setting is changed, the count value is cleared (to 0).

R: When either one of AL3 or AL4 is ON, red display.
G: When both AL3 and AL4 are OFF, green display.

● Comparator output function (AL3, 4) Option

Code No.	Function	Display	Adjustable range	Initial setting
43	AL3 comparison value	AL 3	-999999~999999	999999
44	AL4 comparison value	AL 4	-999999~999999	999999
45	Comparison conditions	EQU.	GO (equals GO), NG (equals NG)	NG
48	AL3 comparison system	FRN3	LO, HI	HI
49	AL4 comparison system	FRN4	LO, HI	HI
52	AL3 output width	YID3	0.00~2.00	0.01s Note 2
53	AL4 output width	YID4	0.00~2.00	0.01s Note 2

Note 2) When made to 0.00, continuous output.

● BCD output option

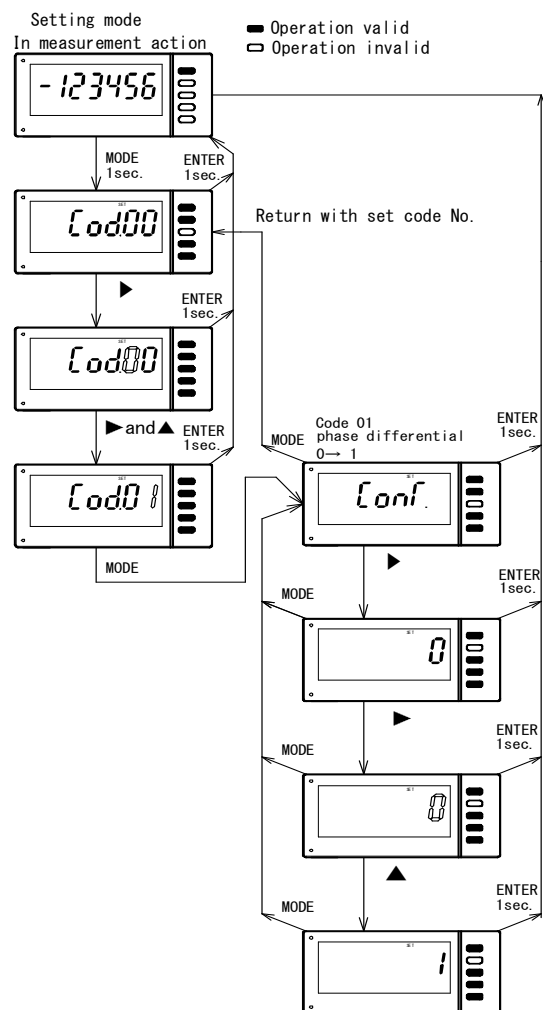
Code No.	Function	Display	Adjustable range	Initial setting
71	Change-over of POL logic	. . .	0 (+ polarity ON) 1 (- polarity ON)	0

● Analog output option

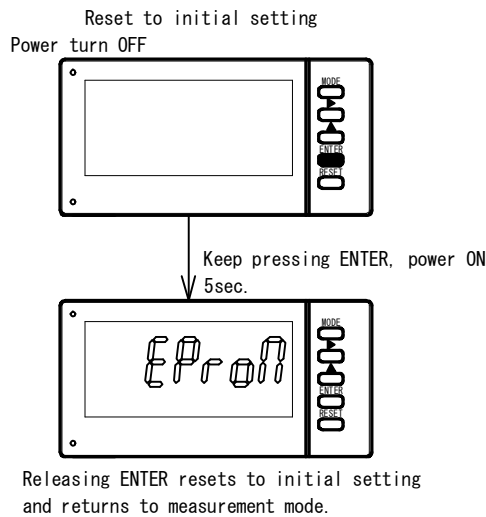
Code No.	Function	Display	Adjustable range	Initial setting
76	Selection of digit	. . . .	0 (last 4 digit) 1 (middle 4 digit) 2 (first 4 digit)	0
77	Output system	. . . .	0 (valid latch input) 1 (invalid latch input)	0
78	Offset	. . . .	0~9999	0
79	Full scale	. . . .	0~9999	9999

● Example of setting

(Phase differential in code No.01)



7. Reset to initial setting



Note: Pay attention that the measured values are reset to the initial value "0". The analog output is reset to the initial value, so the adjustment for it has to be redone.

8. Model name

472B - 【1】 - 【2】 - 【3】 - 【4】 - 【5】

Suffix	Function	Code	Description
【1】	Power supply	A	AC100~240V
		9	DC24V
		C	DC110V
【2】	Sensor power supply	2	DC5V±5% 160mA
		3	DC12V±5% 100mA
【3】	Photo MOS comparator output	X	Blank
		1	Photo MOS relay 2 points expanded (AL3, AL4)
【4】	Analog output	X	Blank
		04	DC0~5V 1kΩ or more
		05	DC0~10V 1kΩ or more
		09	DC1~5V 1kΩ or more
		29	DC4~20mA 510Ω or less
【5】	BCD output	X	Blank
		DN	Open collector output (NPN)

9. Error message

Error related to count over

Display	Description	Action
OVER blinks	Display exceeds ±999999 by 99 times	RESET and make the count value to the initial totalizing value

Error related to setting

All setting mode

Display	Description	Action
· · · ·	There is no number to correspond to the set code No.	Enter the correct code No.
· · · ·	Setting is out of range, for the function having specific range	Set the value within the range

Error related to analog output

Display	Description	Action
· · · ·	When (analog output offset) = (analog output full scale)	Make setting so that (analog output offset) and (analog output full scale) are not equal.

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