

Minebea

***Transmitter for Torque transducer
CSA-562B***

Instruction Manual

FOREWORD

Thank you very much for your purchasing our Transmitter CSA-562B for torque transducer.


This manual explains installation procedures and connecting method and also operating method for the Transmitter CSA-562B for torque transducer. Make use of it properly after reading through the manual carefully.


Be sure to deliver the manual to the end user. Moreover, the end user should keep the manual at hand after reading it over.

Marks and arrangements used in this manual


The following marks are attached to the explanation on the matters that indicate “Don’t do this.”, “Take care.” and “For reference”.

Be sure to read these items where these marks are attached.

 Warning	Warning may cause injury or accident that may harm to the operator. Do not do these things described here.
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	Caution during operation and working. Be sure to read the item to prevent malfunction.
--	--

Mark during operation.	
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	Press the switch.
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For safe operation

Be sure to read this instruction manual before use.

1. Installation place



Use the instrument where the temperature/humidity specifies with the range as follows :

Environmental temperature : 0 to 40

Environmental humidity : Less than 85 %R.H. (Non condensing)

(1) Location where installation is not allowed.



Warning Do not locate the instrument on the places as follows :It may cause an unexpected faulty in the instrument.

- Do not locate the instrument in direct sunshine and/or high temperature area.
- Do not use the instrument in a high humid area.
- Do not install the instrument where there are vibrations and shocks.
- Do not use the instrument where there is excess of dusts and fine particles.
- Do not use the instrument where there are corrosive gas and salt and like that.
- Do not install the instrument where there is rapid change of temperature and humidity.
- Do not install the instrument near the devices that are magnetized or generate an electromagnetic field.
- Do not install the instrument where the instrument may be affected by radioactivity or radial rays.
- Avoid the location where chemical reaction may take place such as in a laboratory, or like that.

(2) Installation

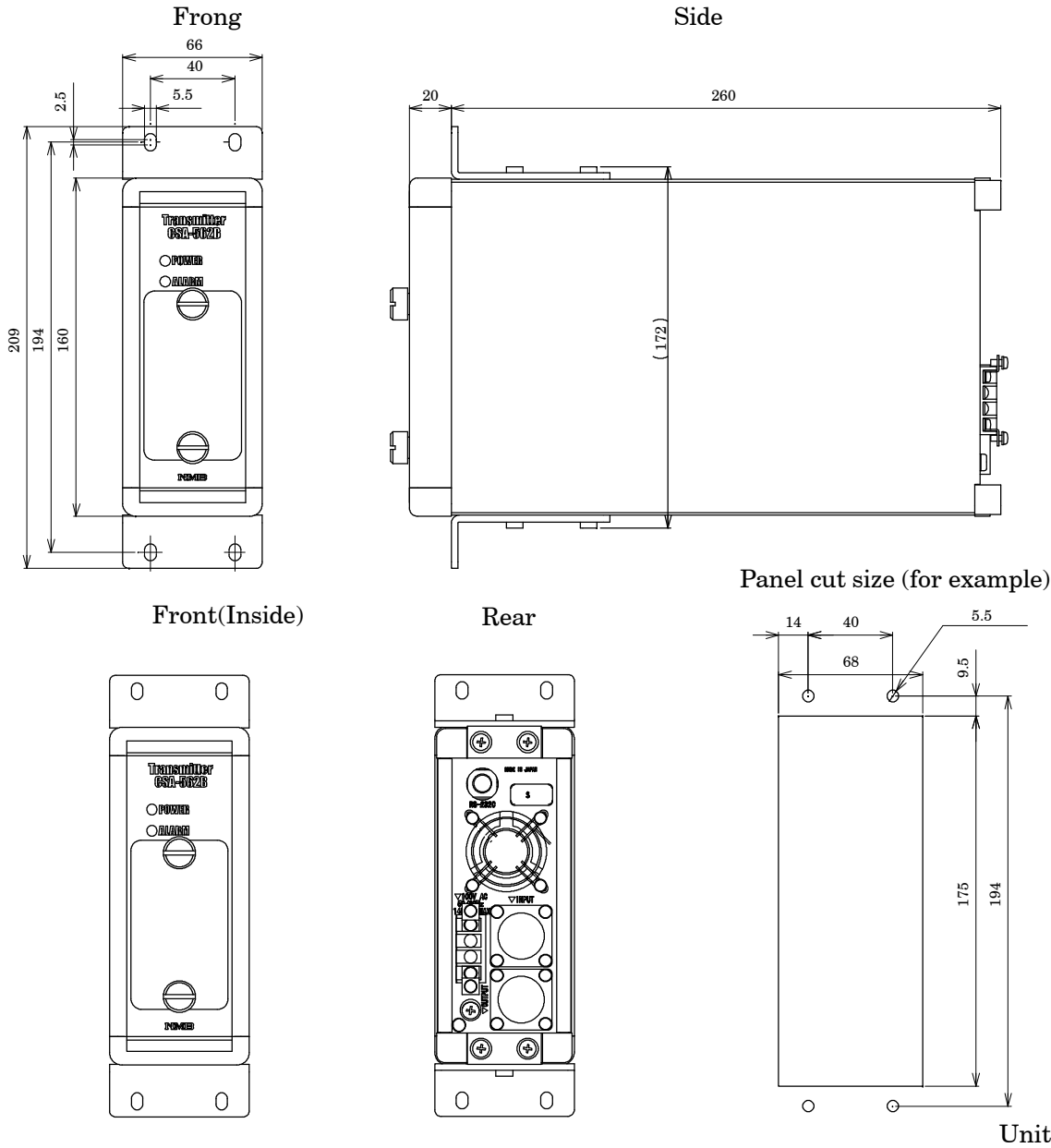


When installing the instrument, install as referring to the following figures and secure the space around the instrument.

Please open the space of about 10mm between the equipments when two or more devices are arranged and set up.

A size of each part and a necessary space for mounting are as follows.

Outline dimensions



Warning Please note the following points to prevent any troublesome, or any electrical shock when you set up the instrument.

- The tolerance of the power supply voltage and the frequency is AC85 V to AC132 V 50/60 Hz.
- Please confirm the power supply voltage of this instrument. Please contact us if there is an uncertain point.

(3) Maintenance of fan motor



Please protect this product so that neither oil nor dust may adhere.
Please execute the maintenance of fan motor once a year.

(4) Maintenance of dust filter



This device has a structure to attach a dust filter to the inlet of the fan motor.
At least once a year is encouraged to replace a dust filter.



Warning Please do not continue to use the dirty dust filter.
May cause unexpected failures.

History of revision

Date	Instruction manual No.	Details of revised point
Jun. 2003	DRW. NO.EN294-1170	First Version
Oct. 2003	DRW. NO.EN294-1170-A	ECN FN03-02108 -Correction- 5-2.Chang of GAIN set value
Jun.2005	DRW. NO.EN294-1170-B	ECN FN05-02055 -Correction- 1.For maintenance of fan motor 3-2.For analog output when stator is connected 4.For output polarity of torque meter 6.For voltage output and current output
Feb. 2010	DRW.No.EN294-1170-C	ECN FN10-02026 - Change - Front cover's logo is changed.
Oct. 2010	DRW.No.EN294-1170-D	ECN FN10-02140 - Change - Minebea logo is changed.
Feb. 2012	DRW.No.EN294-1170-E	ECN FN11-02191A - Add - 1-(4) Maintenance of dust filter 6 <for maintenance of dust filter> 7-4 Add 'Dust filter' 10-2 Exchange method of dust filter - Change - 10-1 Figure of exchange method of fuse
Feb. 2018	DRW.No.EN294-1170-F	Due to ECN FN17-02017 •Delete the company name in the cover page. •Delete the company name in the contents.

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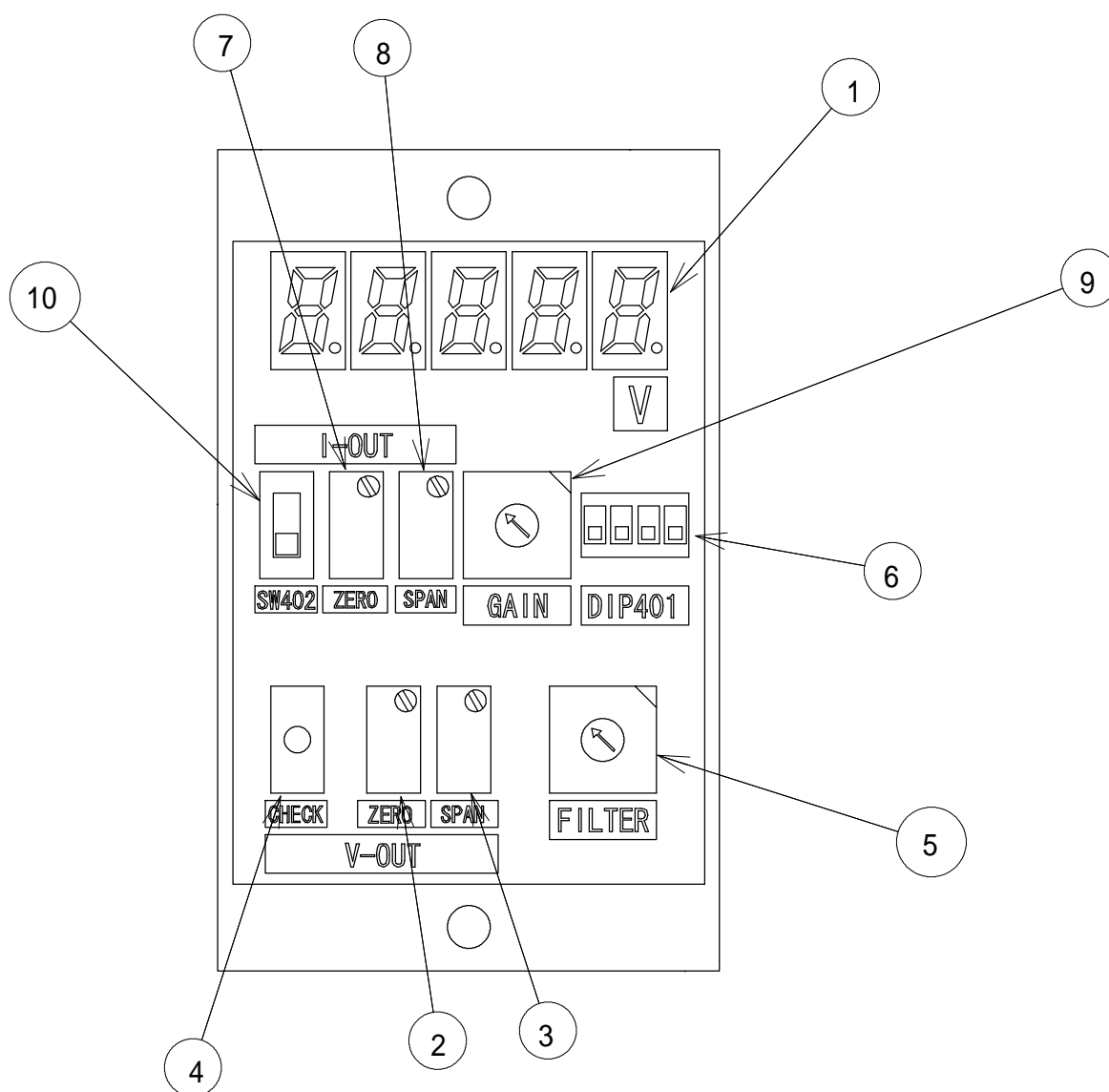
1. General

1-1. Features

- ① Specialized transmitter
Specialized transmitter for exclusive use of optical transformer method torque transducer.
- ② Digital display monitor
4 1/2 digit of digital display is adopted for voltage output monitor, and 1 mV monitoring is available.

2. Name and function of each point

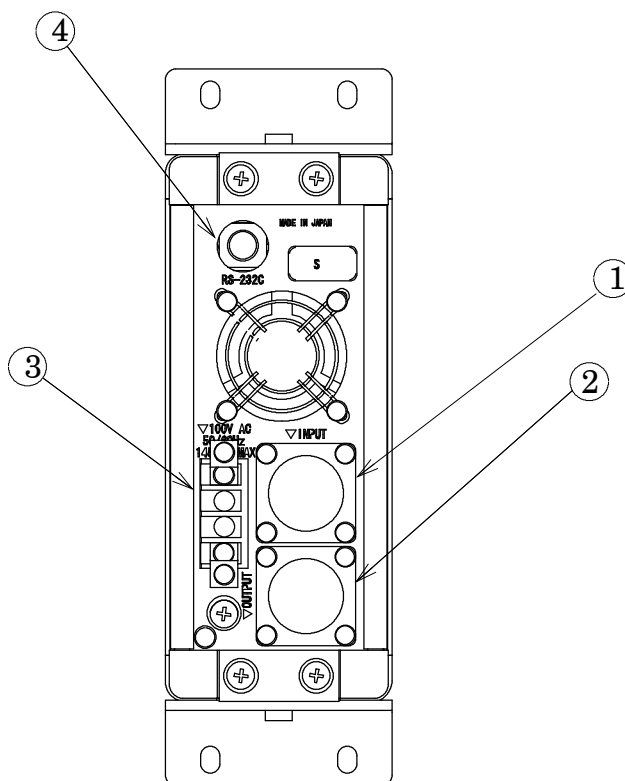
2-1. Front panel



- ① Monitor
Displays the output voltage digitally. (Minimum digit is 1 mV.)
- ② ZERO trimmer
For initial balance adjustment.
- ③ SPAN trimmer
For sensitivity adjustment.

- ④ CHECK switch
Output the check value.
- ⑤ FILTER setting switch
Set the cut-off frequency of low-pass filter.
- ⑥ Attenuator switch
Use for setting the sensitivity of analog output.
- ⑦ ZERO trimmer of the current output (Applied with the optional current output)
Trimmer of zero adjustment use for the current output.
- ⑧ SPAN trimmer of the current output (Applied with the optional current output)
Trimmer of span adjustment use for the current output.
- ⑨ GAIN switch of the current output (Applied with the optional current output)
Use for the set of sensitivity in current output.
- ⑩ Adjustment switch of the current output (Applied with the optional current output)
Use for change of condition in current output.

2-2. Rear panel



- ① INPUT connector
Connect with stator.
- ② OUTPUT connector
Connector for voltage output, current output, external input for check switch and alarm output, and connect with the external equipment
- ③ Terminals for power supply
Terminals for AC power supply.
- ④ Connector for communication
Connector for the factory inspection.

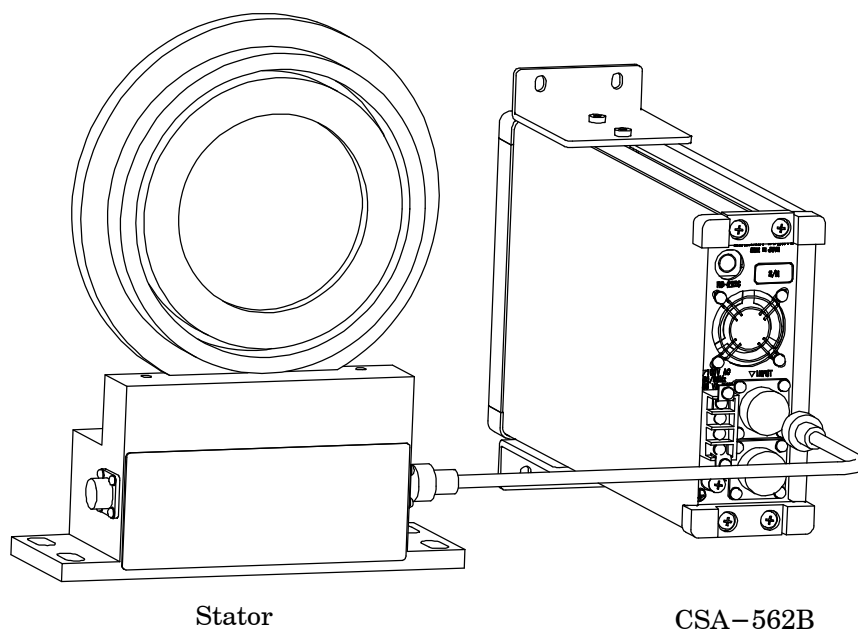
3. Connection and installation method

3-1. INPUT connector

(1) Pin layout

Pin No.	Signal name
1	Differential motion signal of torque(+)
2	Differential motion signal of torque(-)
3	+ 15 V
4	GND
5	- 15 V
6	GND
7	Quantity of light decrease detection output signal
8	COM1
9	Power supply signal to rotor
10	Power supply signal to rotor

(2) Connection with stator



P/N of connector plug

CSA-562B : SRCN6A16-10P (JAE)

Stator : TC1108-12A16-14M 11.8 (Tajimi musen)



Please use the cable attached with torque transducer in connecting the instrument with stator. And, don't extend the cable by using the terminals because it will cause Moreover, please do not extend the cable with a terminal block etc., because it is easily influenced by the outside noise, and it causes the accuracy decrease. Consult us when the length is insufficient in a standard attached cable.

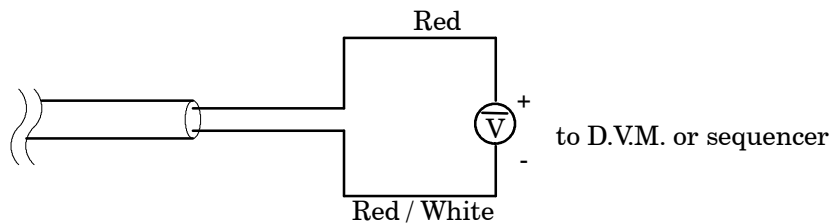
3-2. OUTPUT connector

(1) Pin layout

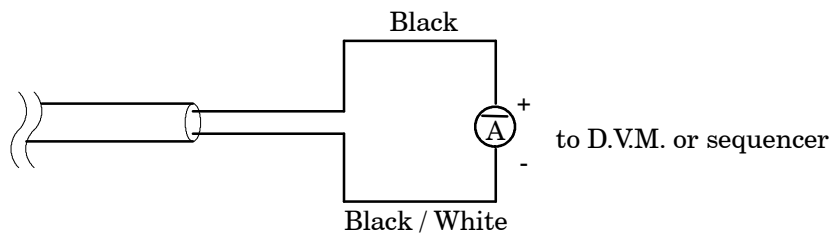
Pin No.	Signal Name	Cable color
1	Voltage output(+)	Red
2	Voltage output(-)	Red/White
3	Current output(+)(Option)	Black
4	Current output(-)(Option)	Black / White
5	External input for check switch	Yellow
6	Common for external input	Yellow / White
7	ALARM output	Green
8	Common for ALARM output	Green / White
9	No use	
10	No use	

P/N of connector plug : SRCN6A16-10S (JAE)

(2) Connection of voltage output



(3) Connection of current output(Option)



As for standard unit, the electric current output is not adjusted.

Execute the adjustment of current output after completing the adjustment of voltage output. When the procedure is made oppositely, the adjusting condition of current output changes.

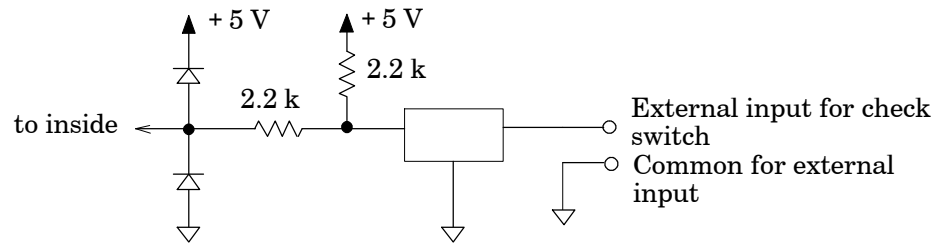
Connection of the instrument with the stator (In the case of the stator is grounded.) makes the voltage output (-) and current output (-) to the same potential as the ground potential

(4) External input of check switch

① Operation

The check value is output when the external input for check switch and the common for the external input is short-circuited.

② Equivalent circuit of input section



The length of attached output cable is 2 m.

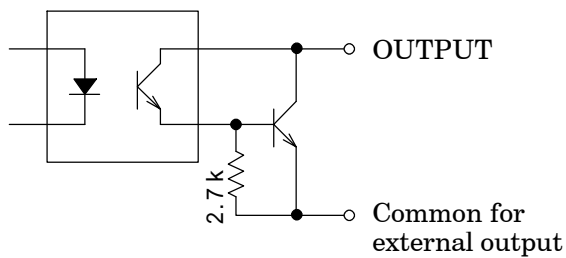
(5) ALARM output

① Operation

It is output outside that normal operation became impossible as ALARM signal when the rotor and stator is not set up at the appropriate position, or when the light part of an optical receiving in the status part becomes dirty.

It is the same operation as ALARM LED of a front panel.

② Equivalent circuit of output section



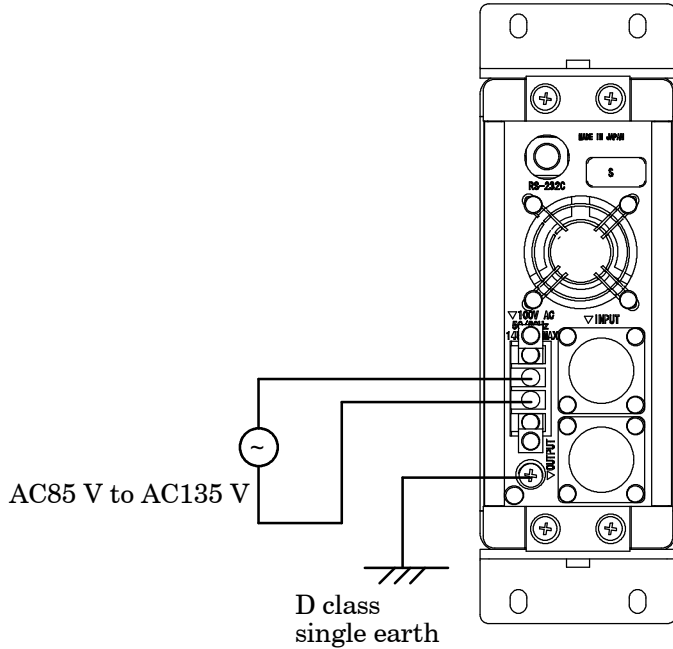
$$V_{CE} = \text{DC}30 \text{ V}, I_C = 30 \text{ mA MAX}$$


3-3. Connection of power supply and ground


Please connect the power supply and the earth as shown in the figure below.

Please give the earth as D class single earth.

Power supply voltage	AC85 V to AC132 V
Power supply frequency	50/60 Hz
Power consumption	145 VA at maximum(at AC100 V)



 **Warning** Connections with the power supply and the earth should be made securely according to the figures and also within the rated capacity of the instrument. If neglected, it may cause an unexpected cause of failure.

 Grounding should be the D class with single earth. If neglected, it may cause an unexpected malfunction due to the effects of noise from other equipments.

3-4. Notes on installation and connection

① Installation place



In case of connection with the instrument, keep strictly to the following items. If neglected, it may cause an unexpected failure or a damage to the instrument.

- Please choose the place without a mechanical vibration and a corrosive gas as the place where this instrument is installed.
Moreover, be careful not to give unnecessary external force to this instrument.
- Please avoid use in the environment that moisture adheres to this instrument
Moreover, please never pour water directly.

② Connection

- The connecting cable with the torque transducer must use the cable attached to the torque transducer.
- Please separate the cable connected with this instrument as long as possible from the noise source, like a power supply line (motor and inverter) or I/O line for control, etc.
It causes the accuracy decrease (zero change and output voltage change, etc.) by the influence of the noise when wiring near these lines.
Especially, please separate the cable which connects the torque transducer with this instrument from these lines by 50 cm or more.

4. Calibration method

4-1. Calibration method of torque

There are two kinds of methods of the torque calibration of this instrument.

① Electrical calibration

The calibration is made electrically by the attached combination inspection data sheet.

② Actual torque transducer

The calibration is made by applying the rated torque to the torque transducer.

4-2. Preparation before adjustment

Supply the power upon confirming if the torque transducer and power supply are connected correctly. (Refer to the paragraph 3-3.)

Please take the warming-up of about 15-20 minutes to make this instrument work stabilizing though this instrument becomes a working condition after turning on the power supply.

4-3. Electrical calibration

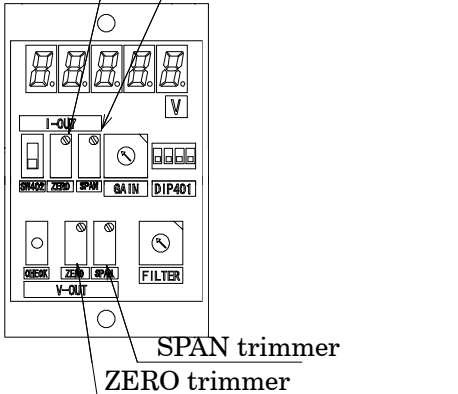
Procedure		
1	The torque transducer is put into the condition that an initial torque (condition built into the device) applies.	
2	Cancel the initial torque Adjust the voltage output to 0.000 V or the current output (option) to 12.00 mA by turning the ZERO trimmer. When the voltage output is used together with the current output (option), the voltage output is previously adjusted, and then, the current output (option) is adjusted.	
3	Span adjustment The output voltage is matched by using SPAN trimmer to become the CHECK value described in the inspection data sheet while pressing the CHECK switch. When the voltage output is used together with the current output, the voltage output is previously adjusted, and then the current output (option) is adjusted.	
4	Readjustment of ZERO point Leave the had from CHECK switch, and proceed the step 2 again to adjust the voltage output to 0.000 V and the current output to 12.00 mA.	
5	Please confirm step 2 to 4 again.	
6	Calibration is completed.	



The output from the Torque transducer will be + voltage output in the counterclockwise direction and - voltage output in clockwise direction.

The output polarity for the Torque transducer is fixed and can't be changed.

4-4. Calibration by actual torque

Process		
1	The torque transducer is put into the condition that an initial torque (condition built into the device) applies.	 <p>ZERO trimmer for current output</p> <p>SPAN trimmer for voltage output</p> <p>SPAN trimmer</p> <p>ZERO trimmer</p>
2	<p>Cancell of initial torque</p> <p>Adjust the voltage output to 0.000 V or the current output (option) to 12.00 mA by turning the ZERO trimmer.</p> <p>When the voltage output is used together with the current output(option), the voltage output is previously adjusted, and then, the current output (option) is adjusted.</p>	
3	<p>Span adjustment</p> <p>Apply the rated torque on the torque transducer. Adjust the voltage output to 10.000 V by using the SPAN trimmer.</p> <p>When the voltage output is used together with the current output (option), adjust the voltage output previously, and then adjust the current output (option).</p>	
4	<p>Re-adjustment of ZERO point</p> <p>Make the torque transducer to no-load condition, and proceed the step 2 again to adjust the voltage output to 0.000 V and the current output (option) to 12.00 mA.</p>	
5	Please confirm step 2 to 4 again.	
6	Calibration is completed.	



The output from the Torque transducer will be + voltage output in the counterclockwise direction and - voltage output in clockwise direction.
The output polarity for the Torque transducer is fixed and can't be changed.

5. Analog output

5-1. Voltage output

① Output

Output ± 10 V at the time of the rated output of torque transducer.

The analog output range can be changed by attenuator switch (DIP401).

DIP401	Output range
only 1 is ON	0 ± 10 V
only 2 is ON	0 ± 5 V
only 3 is ON	0 ± 2 V
only 4 is ON	0 ± 1 V

Please make the setting of switch as only one.

② Electrical condition

- Load resistance : 2 k or more
- Capacitance load : 0.1 μ F or less

5-2. Current output (option)

Adjustment can be made when the optional current output is set.

Please execute the setting after turning off the power.

① Output

The following setting of the current output can be made at the rated output from the torque transducer.

i) When the output of $12.00 \text{ mA} \pm 8.00 \text{ mA}$ at $0 \sim \pm$ rated output of torque
The current output adjustment switch (SW402) is set to the upper part.

ii) When the output of $4.00 \text{ mA} \sim 20.00 \text{ mA}$ at $0 \sim +$ rated output of torque.

The current output adjustment switch (SW402) is set to the lower part.

The main setting of the voltage output and the current output is as follows;

a) When 12 mA of the current output at 0 V of the voltage output

Voltage output	Current output	SW402	GAIN
- 10 V ~ 10 V	4 mA ~ 20 mA	Upper side	1
- 5 V ~ 5 V	4 mA ~ 20 mA	Upper side	2
- 2 V ~ 2 V	4 mA ~ 20 mA	Upper side	5
- 1 V ~ 1 V	4 mA ~ 20 mA	Upper side	8

b) When 4 mA of the current output at 0 V of the voltage output

Voltage output	Current output	SW402	GAIN
0 V ~ 10 V	4 mA ~ 20 mA	Lower side	2
0 V ~ 5 V	4 mA ~ 20 mA	Lower side	4
0 V ~ 2 V	4 mA ~ 20 mA	Lower side	8
0 V ~ 1 V	4 mA ~ 20 mA	Lower side	F

② Electrical condition

- Load resistance : 510 or more

5-3. Filter


The cut-off frequency of the low-pass filter can be set with FILTER set switch.

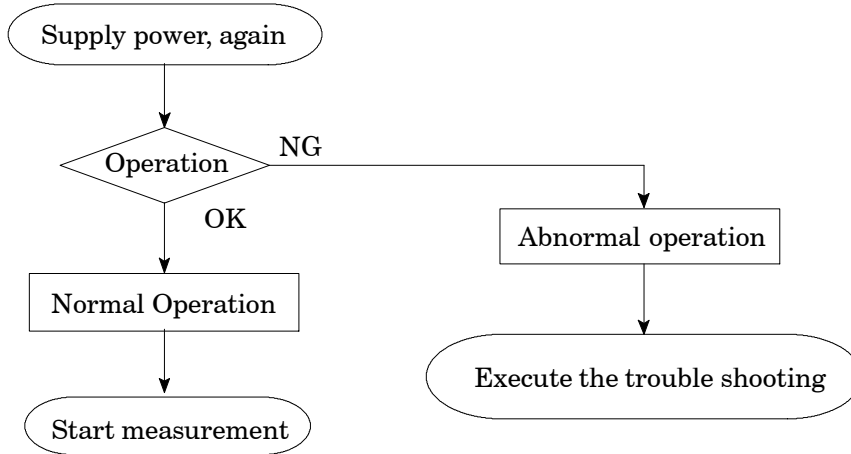
FILTER	Cut-off frequency
0	1 Hz
1	10 Hz
2	30 Hz
3	50 Hz
4	100 Hz
5	300 Hz
6	500 Hz
7	1 kHz
8	-
9	-

(Don't set to 8 and 9 of the FILTER set switch.)

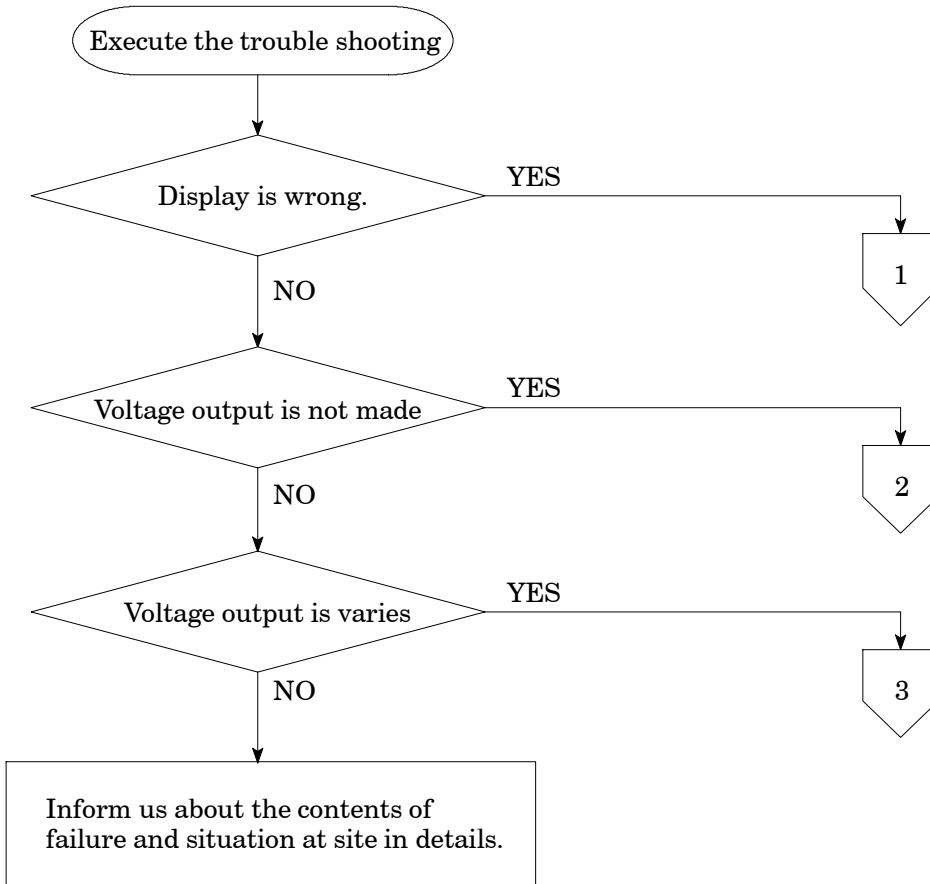
6. Trouble shooting

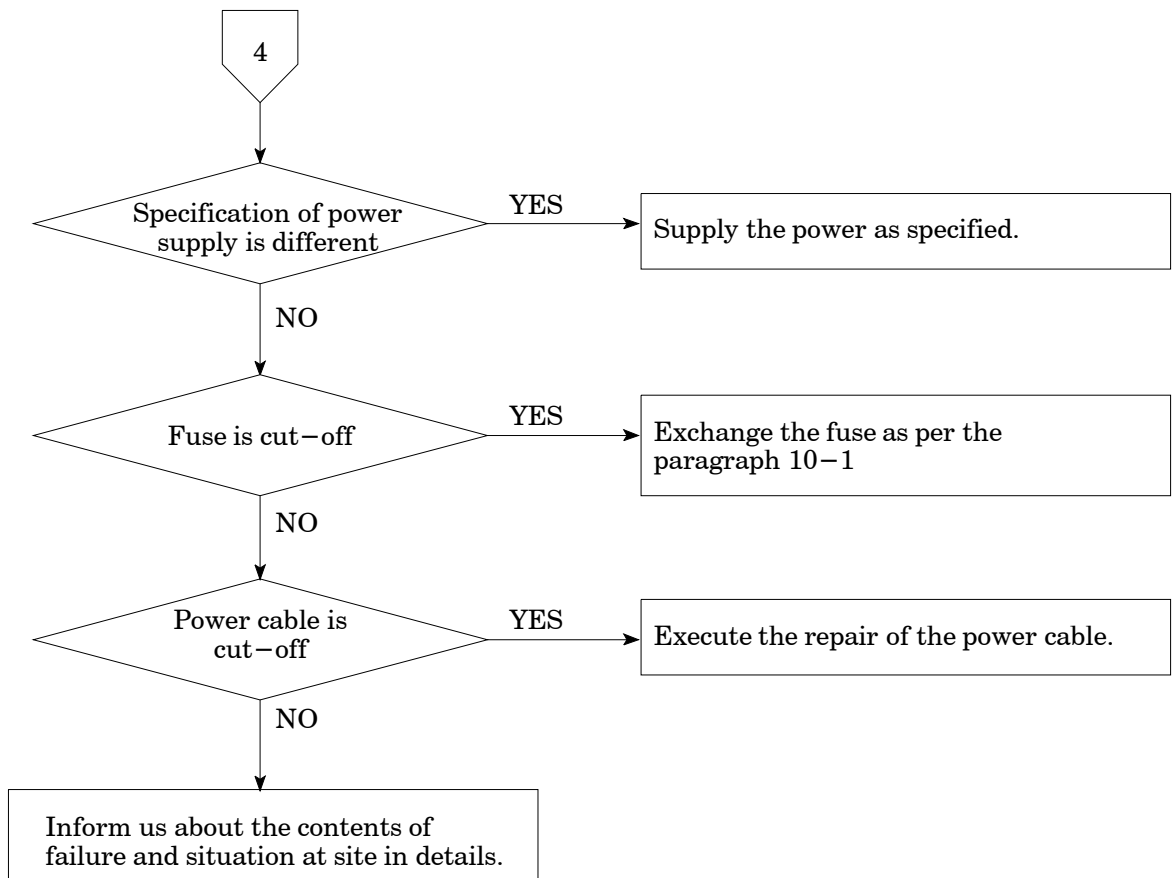
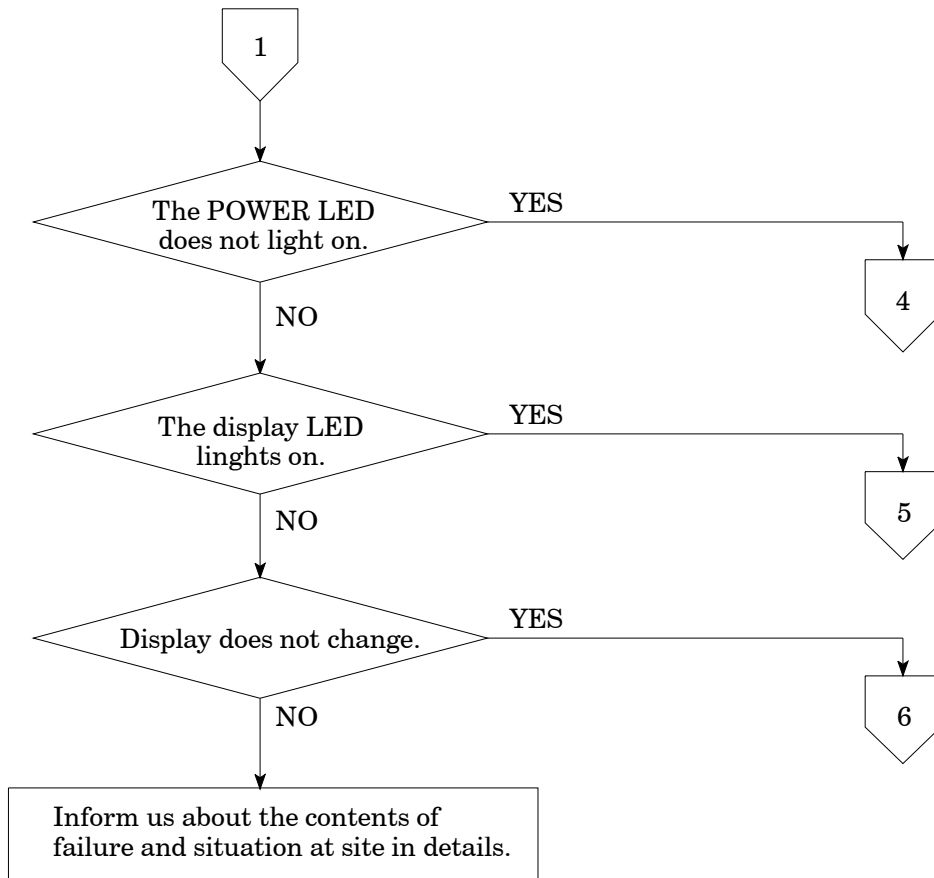
When abnormal point(s) is/are found during the operation of the instrument, check by the following procedures. However, when you can't find applicable item nor solve the symptom of trouble even after you have taken some measures, contact us.

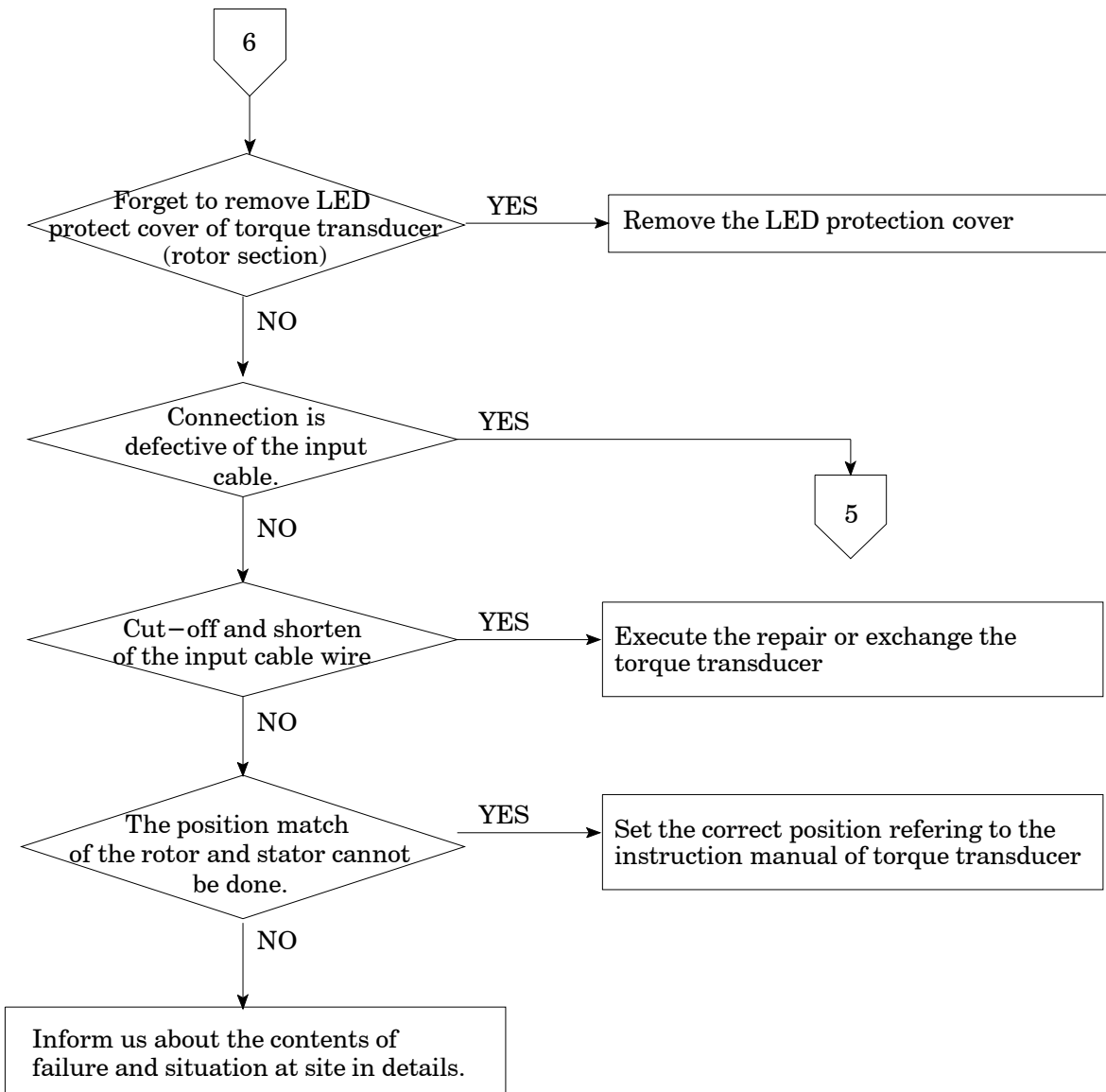
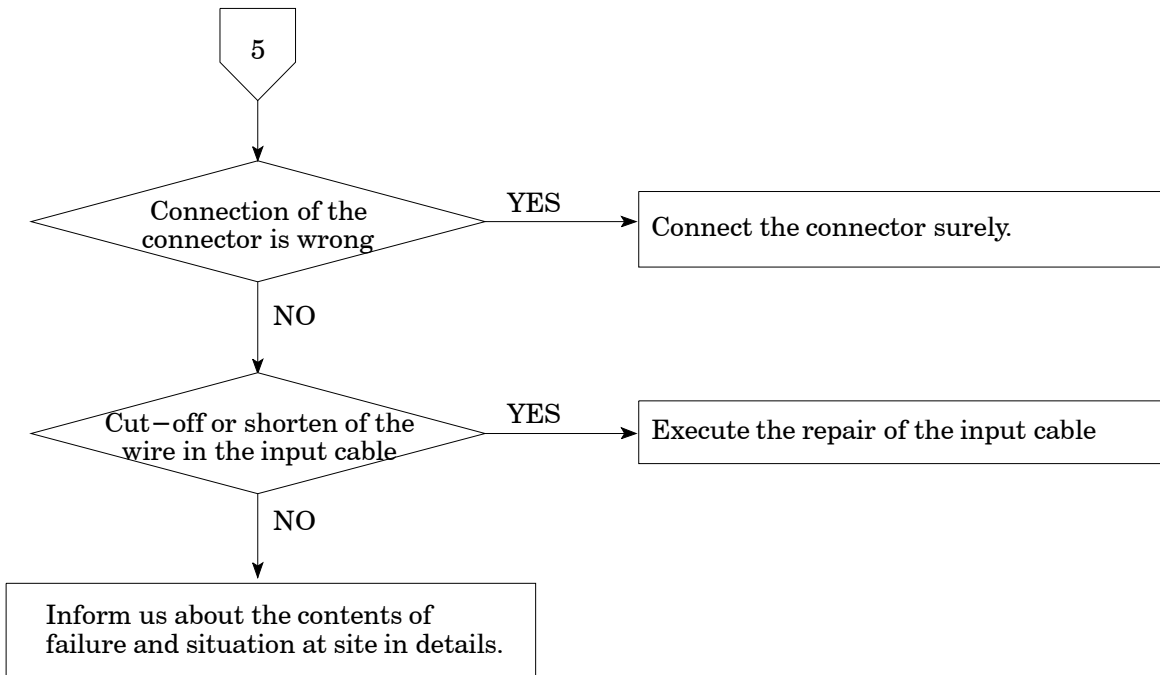
 **Warning** Please proceed very carefully since the confirmation in the condition to supply the power has the possibilities such as electrical shocks and leaks.

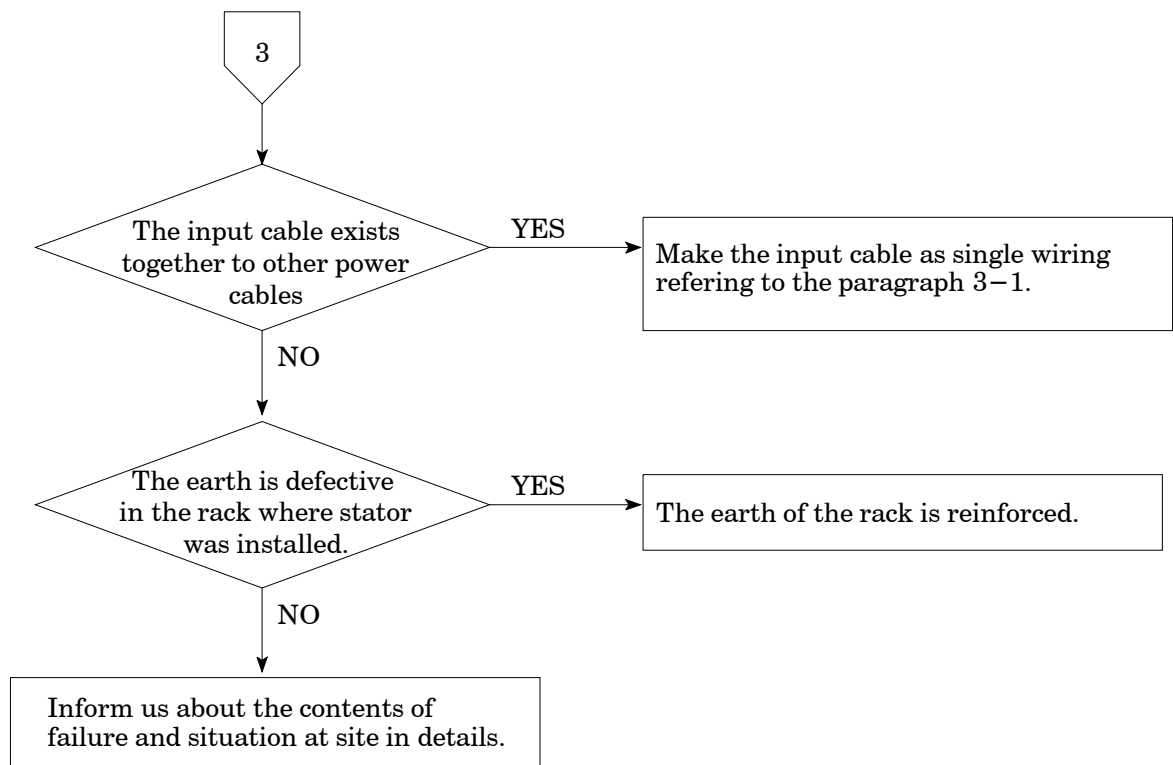


6-1. Execute the trouble shooting









< For earth reinforcement of rack >

A defective earth of the rack where stator was installed is thought as a change cause of the voltage output. Especially, there is a possibility to be generated by the influence of the inverter noise by a defective earth when it is an inverter motor etc. and a common rack.

Please execute the reinforcement of the earth of the rack where stator was installed.

Moreover, the influence of the inverter noise might be decreased by floating the stator from the rack using the insulating material electrically.

< For maintenance of fan motor >

When this product is used under the environment of the oil mist, there is a thing which fan motor stops because of oil and dust.

A serious problem which leads to the breakdown occurs if fan motor stops.

Please execute the maintenance of fan motor once a year.

< For the voltage output and current output >

Connecting of the instrument with the stator (In the case of the stator is grounded.) makes the voltage output (–) and current output (–) to the same potential as the ground potential.

When you make a connection with other instrument with the + voltage output and – voltage in adverse, so as to obtain an opposite output polarity of Torque transducer, but the voltage output of the instrument will become short and the output will not change in the case that – terminal at the side of measuring instrument is the same potential with the ground.

When you want to adopt such method, we recommend to insert an isolator at the output section of the instrument.

<For maintenance of dust filter>

Contamination of the dust filter, lower the internal cooling capacity, voltage output and current output fluctuations caused, which may cause other serious problems. At least once a year is encouraged to replace the dust filter.

7. Specifications

7-1. Specifications

Power supply voltage to rotor	AC20.0 Vrms Square wave 11.2 kHz \pm 0.2 kHz
Applicable transducer	Optical transformer method torque transducer
Input range	5 kHz to 15 kHz
Output	\pm 10 V
Output load resistance	Load resistance 2 k Ω or more Load of output capacitance 0.1 μ F or less
Zero adjustment range	\pm 15 %R.O.
Non-linearity	0.01 %F.S.
Temperature coefficient	
Zero point	\pm 0.025 %R.O./10
Sensitivity	\pm 0.025 %R.O./10
CHECK	Approx.80 %R.O Accuracy \pm 0.03 %
Frequency response range	DC to 1 kHz (Filter : W/B) (Changeable to 1 Hz, 10 Hz, 30 Hz, 50 Hz, 100 Hz, 300 Hz, 500 Hz or 1 kHz) However, 10 Hz to 1 kHz : + 1 dB, - 3 dB \pm 1 dB, 1 Hz : + 1 dB, - 3 dB \pm 3 dB
Display section	
Display of output voltage	0 to \pm 10.000 digital display (Green LED)
Sampling	Approx. 4 times/s
Remote function	CHECK
ALARM function	ALARM output

7-2. General specifications

Operating temperature/humidity range	0 to 40 85 %RH or less (Non condensing.)
Power supply	
Power supply voltage	AC85 V to AC132 V
Power supply frequency	50/60 Hz
Power consumption	Approx. 100 VA (at AC100 V)
Insulation resistance	Between power line and case DC500 V, 100 M Ω or more Between power line and case AC1 500 V, 1 min period
Outline dimension(W \times H \times D)	42 mm \times 176 mm \times 284.4 mm (Excludes protruding parts.)
Weight	Approx.2.5 kg

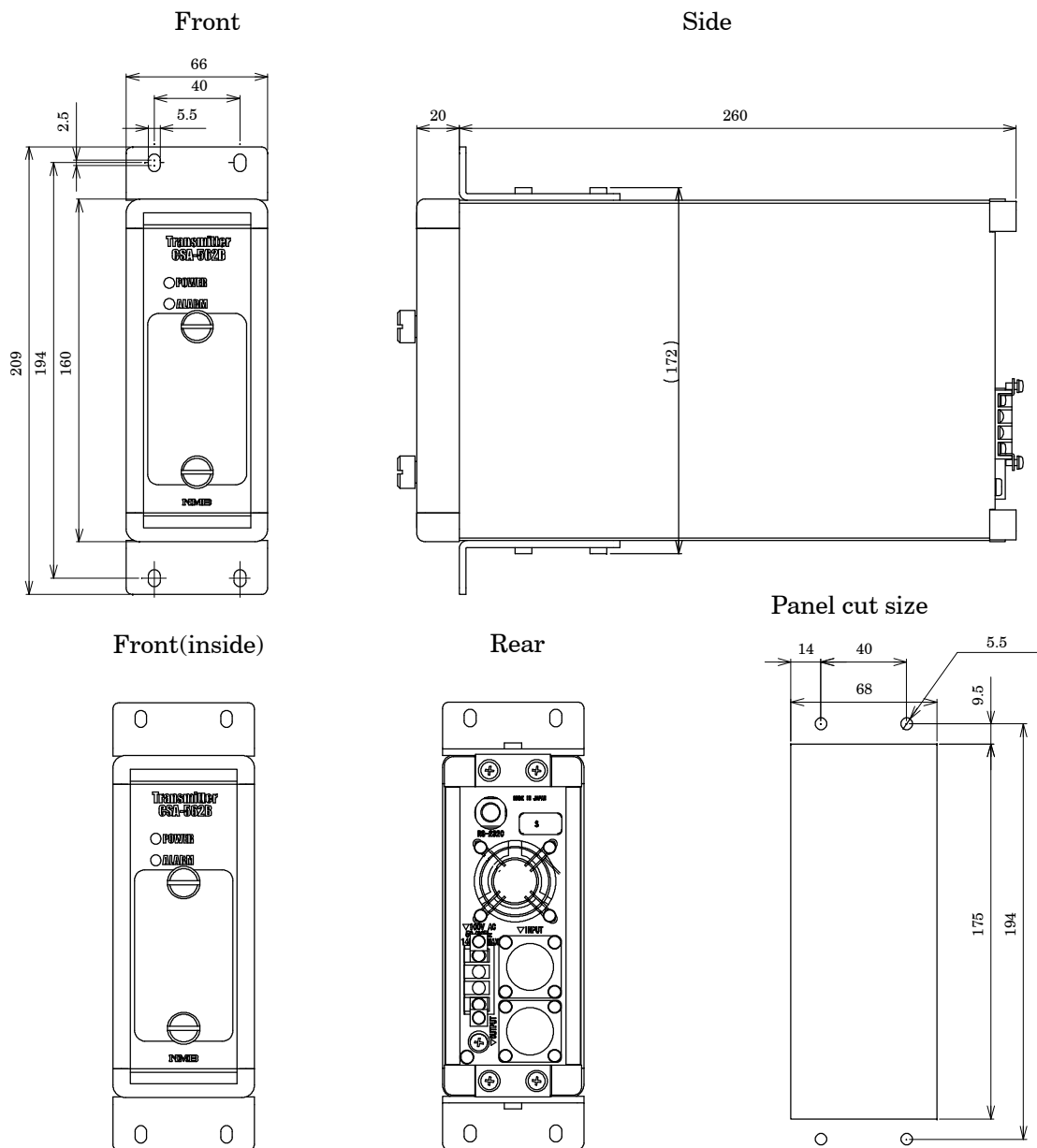
7-3. Standard specifications at the shipment

SPAN	10 V output at rated output from torque transducer
Frequency response range	1 kHz

7-4. Accessories

Instruction manual	1 piece
Fuze(5 A)	1 piece
Output cable(2 m)	1 piece
Dust filter	10 pieces

7-5. Outline dimensions



Unit : mm

8. Options

8-1. Current output

P/N	CSA562B-P07
Output	4 mA to 20 mA
Load resistance	510 or less
Non-linearity	± 0.05 %F.S. or less

9. Warranty

9–1. Warranty

- The instrument is covered by a warranty for a period of one year from the date of delivery.
- As for repairs and/or after service is required during the period of warranty, contact us sales office or sales agent from which you have purchased.

9–2. Repair


Before asking repairs, make checks once again that the connection, setting and adjustment for the instrument have finished properly by referring to 6. Trouble shooting.

Especially, make checks whether the connections of sensors are disconnected or cut off.

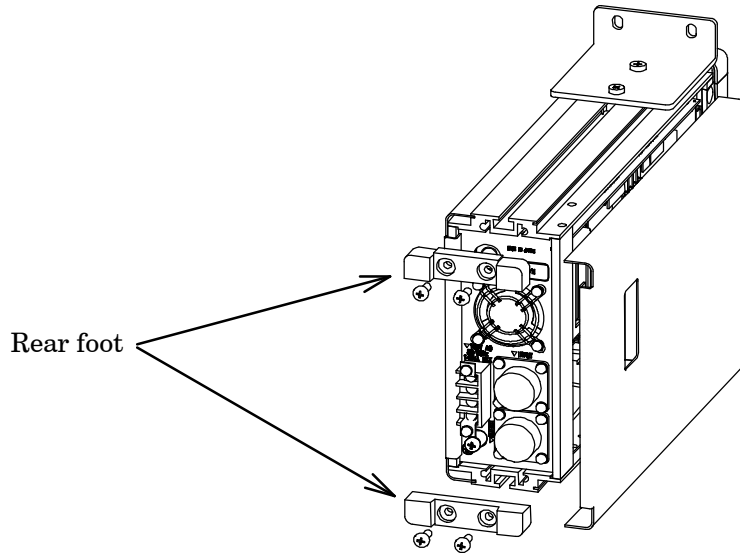
After that, still there may be found some defects in the instrument, contact us sales office or sales agency from which you have purchased.

10. Appendix

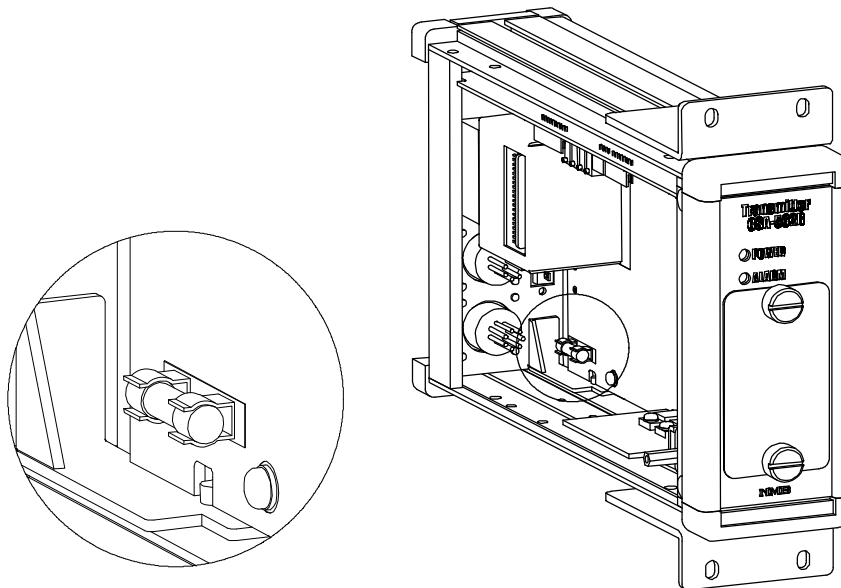
10-1. Exchange method of fuze

 **Warning** When installation method for the fuze is wrong and/or the capacity of installed fuze is inadequate, it causes an unexpected fault of the instrument.

- ① Turn OFF the power supply for the instrument.
- ② Remove the rear foot, and panel assembly.



- ③ Remove the cover of the left of the front.
- ④ Exchange the fuze installed in the power card



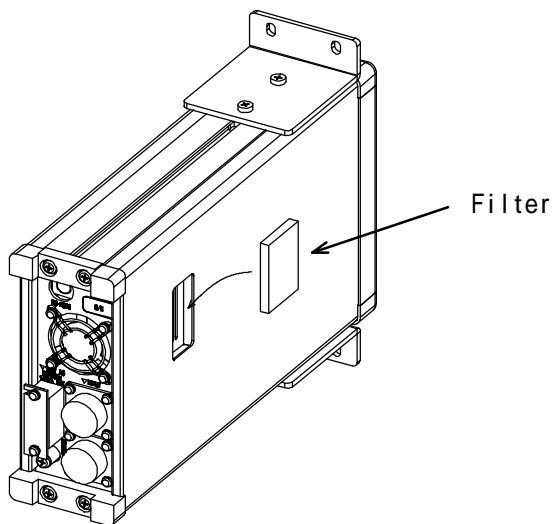
- ⑤ After the fuze is exchanged, the cover and the panel installation rear foot are stopped with the screw.

10-2. Exchange method of dust filter



Warning Please do not continue to use the dirty dust filter.
It may cause unexpected failures.

- ① Turn OFF the power supply for the instrument.
- ② Replace the dust filter in the groove of left cover.
(there are no sides)
- ③ To clean, squeeze the center of the dust filter. It can be easily removed by pulling outward.



●The contents of this manual may subject to change without notice.

HEAD QUARTER: **MinebeaMitsumi Inc.**

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