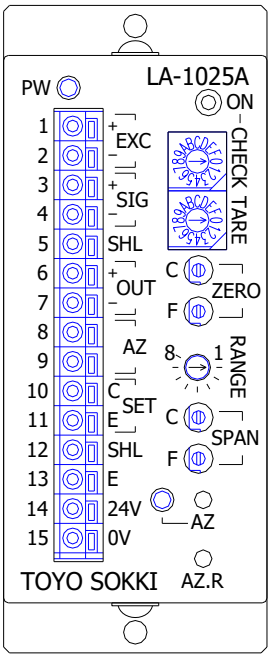
LOAD CELL AMPLIFIER

MODEL　L A – 1 0 2 5 A

OPERATION　MANUAL



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MA4-00283-R2 (2020/5)

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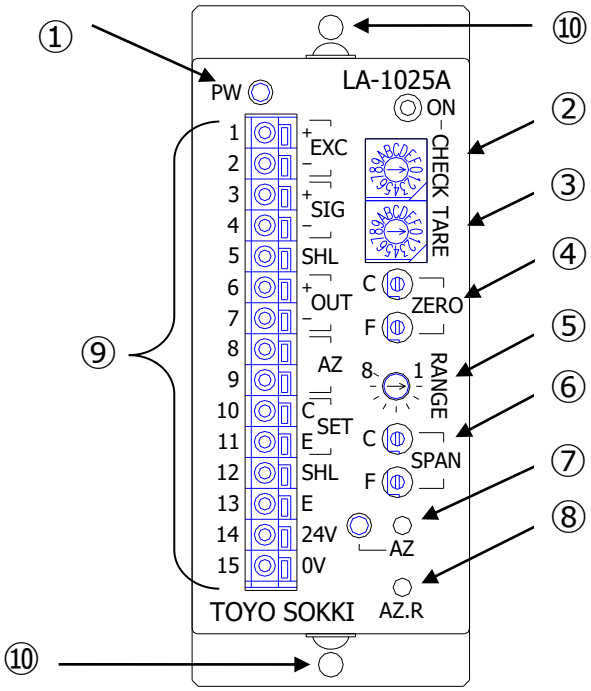
※This operation manual is applicable after May 2015 shipment.

This document is translated from MA4-00247-R2 (Japanese)

§1. Summary

LA-1025A is an instrumentation amplifier which amplifies signal from a strain gauge type transducer and output ±5V voltage signal or 4～20mA current signal. (Specify the type of output signal at the time of ordering).
In addition, this unit has an Auto Zero (AZ) function which enables Tare subtraction by a button operation or external command input operation.
Power is supplied with DC 24V. Input power supply and output of voltage/current is isolated by the built-in DC/DC converter.

§2. Appearance and Each name



①	POWER (LED)	Powered indicator LED (Always ON during power on)
②	CHECK	Pseudo input signal generation button switch (CAL SW)
		Pseudo input signal setting 16 position rotary switch
③	TARE	For Tare subtraction, 16 position rotary switch
④	ZERO (C, F)	Zero point adjustment trimmer (Coarse , Fine : 15 rotation)
⑤	RANGE	Amplification range rotary switch (8 position)
⑥	SPAN (C, F)	Span adjustment trimmer (Coarse , Fine : 15 rotation)
⑦	AZ (LED, SW)	Auto Zero operation switch and indicator LED
⑧	AZ.R	Auto Zero reset switch
⑨	TERMINALS	Terminals for Load Cell, output, AZ and power line
⑩	MOUNTING HOLE	Fixing hole 2−Φ4.0

※ This unit should be specified by either current output type (LA-1025A-1) or voltage output type (LA-1025A-2). Sensor excitation voltage is selectable from 2.5V, 5.0V or 10V. 10V is as standard. Filter characteristic (fc) is selectable either one of 2Hz, 5Hz, 10Hz, 20Hz, 50Hz, 100Hz, 200Hz, 500Hz or 1kHz. 2Hz is as standard. Specify excitation voltage and filter characteristic at the time of order. Please confirm the nameplate attached to the side of this unit whether the specification is correct as specified at the time of order.

§3. Operation

This unit is equipped with current output or voltage output. Voltage output can be bipolar and can be output up to ±5V. (Max. ±10V depending on the input signal intensity)

3 – 1) TARE (Tare setting, 16 position rotary switch)

It is possible to cancel unbalanced voltage corresponding to Tare amount by using this switch. The setting code is from 0 to F in 16 positions and can be set in approx. 0.15mV/V steps (0～2.25mV/V). Tare cancel amount will be larger as the setting position becomes larger.

When you want to adjust the output to 4mA or 0V (with Tare load applied), set a coarse [ZERO] trimmer at the center position beforehand and turn a [TARE] rotary switch to set the output value to the lowest level.

If the weight of Tare load is known in advance, equivalent output level of Load Cell weighing Tare load can be calculated using the following formula to determine the code of TARE rotary switch.

$$\text{Equivalent LC output of Tare (mV/V)} = \frac{\text{Tare load weight}}{\text{Load Cell rated capacity}} \times \text{Load Cell rated output (mV/V)}$$

Code	Tare amount	Code	Tare amount	Code	Tare amount	Code	Tare amount
0	0 mV/V	4	0.6 mV/V	8	1.2 mV/V	C	1.8 mV/V
1	0.15 mV/V	5	0.75 mV/V	9	1.35 mV/V	D	1.95 mV/V
2	0.3 mV/V	6	0.9 mV/V	A	1.5 mV/V	E	2.1 mV/V
3	0.45 mV/V	7	1.05 mV/V	B	1.65 mV/V	F	2.25 mV/V

3 – 2) ZERO (Zero point adjustment trimmer)

This is a zero adjustment trimmer to set the output voltage to 4mA or 0V when there is unbalance voltage of Load Cell or voltage of Tare load. There are a coarse adjustment trimmer and a fine adjustment trimmer.
Adjustment range of zero trimmer is approximately ±0.1mV/V.
If zero adjustment cannot be achieved within this range, use a [TARE] rotary switch.

3 – 3) RANGE (8 position rotary switch for amplification range)

Set the amplification range of current or voltage to the desired degree when the maximum load is loaded. Amplification range is adjustable in 8 position by a [RANGE] rotary switch. Amplification will be larger as the setting position becomes larger. Necessary [RANGE] is determined by the following formula. Please refer the Table below.

$$\text{LC output of maximum load (mV/V)} = \frac{\text{Maximum load}}{\text{Load Cell rated capacity}} \times \text{Load Cell rated output (mV/V)}$$

$$\text{Required amplification} = \frac{\text{Desired output voltage at maximum load (mV)}}{\text{Load Cell output of maximum load (mV/V)} \times \text{EXC (V)}}$$

※EXC is applied voltage to Load Cell = 10V, 5V or 2.5V

Required amplification corresponding to [RANGE] rotary switch

RANGE	Amplification			Necessary LC output amount (mV/V)	
	(EXC = 10V)	(EXC = 5V)	(EXC = 2.5V)	for output 5V, 20mA	for output 10V
1	149～ 228	298～ 456	596～ 912	3.36～2.19	–
2	209～ 319	418～ 638	836～ 1276	2.39～1.57	–
3	299～ 456	598～ 912	1196～ 1824	1.67～1.10	3.36～2.19
4	418～ 638	836～1276	1672～ 2552	1.20～0.78	2.39～1.57
5	598～ 911	1196～1822	2392～ 3644	0.84～0.55	1.67～1.10
6	837～1276	1674～2552	3348～ 5104	0.60～0.39	1.20～0.78
7	1195～1823	2390～3646	4780～ 7292	0.42～0.27	0.84～0.55
8	1643～2506	3286～5012	6572～10024	0.30～0.20	0.60～0.39

3 – 4) SPAN (Span adjustment trimmer)

This is a span adjustment trimmer for amplifying signal of current or voltage. There are a coarse adjustment trimmer and a fine adjustment trimmer.
Rotate a trimmer clockwise (CW) to increase amplification, counterclockwise (CCW) to decrease it. Rotate a coarse adjustment trimmer fully counterclockwise (CCW) can reduce the output to about 70% of the maximum.
If adjustment cannot be done within this range, change a [RANGE] rotary switch setting.

3 – 5) CHECK (Pseudo input signal rotary switch)
(Pseudo input signal generating push switch)

While pressing a [CHECK] button switch, a pseudo input signal can be generated and added to the input signal. The pseudo input signal can be set at about 0.15mV/V step by 16 position rotary switch. After calibration of the scale is completed, with no load (output is 4mA or 0V), pressing a [CHECK] button switch (Keep pressing) and turn a [CHECK] rotary switch to set the output to be 75% or more of measured value of the maximum load. By making a note of the rotary switch setting position and output value, it can be used as a secondary calibration value.
Even if the span trimmer is touched after calibration, the span amount can be re-calibrated based on this secondary calibration value.

3 – 6) AZ (Auto zero push switch and LED)

This function is to set the output voltage or current to 0V or 4mA by a button operation or external input operation.
AZ operation range is ±2.0V or 0～10.4mA of the output. The output level is memorized as the offset level and this unit always subtracts this offset level afterwards.

By pushing a [AZ] button for 3 seconds, operates auto zero
By pushing a [AZ.R] button for 3 seconds, operates reset auto zero and the output is restored.

If AZ function operates successfully, LED [AZ] turn ON and keep it ON during AZ operation. If the output is out of the AZ range, LED [AZ] will be blinking and it doesn't accept AZ operation. Blinking will be stopped after pushing a [AZ.R] button for 3 seconds.

By external input operation, use a one-shot Make contact, whose pulse width approx. 200ms. If AZ function operates successfully, output signal [SET] is ON for approx. 200ms, as answer back. If it is out of the AZ range, it doesn't accept AZ operation, doesn't output signal [SET] and LED [AZ] will be blinking as an error. This unit has no external input for [AZ.R]

No answer back signal [SET] is output during a [AZ] button operation

! Precaution of AZ operation

AZ operation has to be performed when the output is in stable. It is necessary to be stable at least 0.5 second before AZ operation

Perform AZ operation within the AZ range. This unit has a margin of operation range and can be operated in the range of -2.2V～+2.2V or -3.04mA～+11.04mA.

If it is out of this range, it doesn't accept AZ operation and LED [AZ] will be blinking as an error. By external input operation, answer back signal [SET] is not output, telling that AZ operation is not accepted. Even if it is in an error and LED [AZ] is blinking, this unit is operated as it is before AZ operation. Error is canceled if a [AZ.R] button is pushed for 3 seconds or re-AZ operation is made while it is within the operation rage.
Data related with AZ operation are memorized in a non-volatile memory and cannot be disappeared even after power OFF and resume a same operation status when powered ON again.

§4. Calibration

Calibrate the output level to 4mA or 0V with no load on Load Cell, and calibrate the output level to the desired current or voltage with maximum load on Load Cell. The voltage output is a bipolar output. If the span amount is more than 0.6mV/V, output ±10V is possible. Calibration operation is based on "actual load calibration" using a known weight such as a reference weight.

4 – 1) Necessary setting prior to calibrate

1). Amplifier gain setting (RANGE setting)

Set the amplification range for the desired output level. Calculate Load Cell output of maximum load and select the corresponding RANGE (1 ～ 8)
For a calculation method of Load Cell output of maximum load, refer to section 3-3).

4 – 2) Calibration method with actual load

1). Put nothing on Load Cell (only the initial Tare load is applied)
2). Turn a [TARE] rotary switch to set the position where the output is closest to 4mA or 0V.
3). Turn a [ZERO] trimmer (Coarse, Fine) to adjust the output to 4mA or 0V.
4). Place a known weight such as a reference weight on Load Cell and turn a [SPAN] trimmer (Coarse, Fine) to adjust to the desired output current or output voltage.
5). Remove a known weight such as reference weight from Load Cell.
6). Confirm that the output value is 4mA or 0V. If not, repeat from step 3) above.

※ If calibration operation cannot be done properly, refer to section §5 Troubleshooting and take measures.

§5. Troubleshooting

If this unit does not work properly, please contact us if the problem cannot be solved by the following measures. At this time, please inform us of the model name, product serial number, the malfunction symptoms and usage as much as possible. The model name of Load Cell or a sensor connected to this unit should be also informed.

5 – 1) Basic Check Point

1). Check whether using a correct power supply. This unit is supplied voltage DC+24V.
2). Check whether the terminals are connected properly and firmly.

5 – 2) What to do if the desired calibration is not achieved

1). Zero adjustment cannot be done

Zero adjustment range by a [ZERO] trimmer is approx. ±0.1mV/V.
If the output is more than 4mA or 0V even if a [ZERO] trimmer is turned fully counterclockwise (CCW), increase a [TARE] rotary switch setting.
If the output is less than 4mA or 0V even if a [ZERO] trimmer is tuned fully clockwise (CW), decrease a [TARE] rotary switch setting.

2). When span adjustment, the desired output current or output voltage cannot be set.

If the output is below the desired value even if a [SPAN] trimmer is turned fully clockwise (CW), change a [RANGE] rotary switch and increase the amplification range by one step.
If the output exceeds the desired value even if a [SPAN] trimmer is turned fully counterclockwise (CCW), change a [RANGE] rotary switch and decrease the amplification range by one step.
Eight steps can be set according to a [RANGE] rotary switch setting. If the desired output is not obtained even if trying a rotary switch setting, check whether Load Cell output satisfies the sensitivity adjustment range of this unit.

3). Output current is out of range of 0～20mA or the output voltage is out of range of ±10V even though it is not overloaded.
① When a part of Load Cell cable is disconnected. (Ref: Section 5-4-1)
② A [TARE] rotary switch setting is inappropriate. (Ref: Section 5-2-1)
③ A [RANGE] rotary switch setting is inappropriate. (Ref: Section 5-2-2)
④ When Load Cell becomes defective. (Ref: 5-4)

5 – 3) The output does not become 0V or 4mA after AZ operation

1). LED [AZ] is flashing ON and OFF after AZ operation.

Please check whether the output level of this unit is within the AZ operation range. AZ operation range is ±2.0V or 0～10.4mA of the output.

If it is out of this range, it doesn't accept AZ operation and LED [AZ] will be blinking as an error. Even if it is in an error and LED [AZ] is blinking, this unit is operated as it is before AZ operation. Error is canceled if a [AZ.R] button is pushed for 3 seconds or re-AZ operation is made while it is within the operation rage.

2). The output does not become 0V or 4mA completely.

This situation is related with the AZ circuit inside this unit. AZ circuit has been adjusted at the time of the shipment, so normally it is not necessary to re-adjust it. If there is a level difference between a connected equipment and need to adjust the output level, please adjust the method as follows. If the output doesn't become 0V or 4mA after re-adjust the AZ circuit, please consult us.

If there is some residual voltage or current after AZ operation, it is possible to re-adjust the AZ circuit

inside this unit by the following method.

① Confirm zero of the output with no load on Load Cell (only initial tare load is possible) and adjust zero if it is necessary.

② After confirm zero of the output, turn power OFF.

③ Turn power ON while pushing a [AZ] button. It leads to zero point adjustment mode of AZ function (LED [AZ] is blinking)

④ The output starts to change if keep pushing either of two buttons. Pushing a [AZ] button increase the output. Pushing a [AZ.R] button decrease the output. Adjust the output to 0V or 4mA. This is zero point adjustment of AZ erasing voltage.

⑤ Turn power OFF again and resume power without pushing any buttons.

After above adjustment is done, push a [AZ] button when no load on Load Cell and confirm the output is ±2mV or 4mA ±6.4μA with LED [AZ] turned ON. Next, put some load on Load Cell and let the output as close to 2V as maximum AZ operation range. In this situation, operate AZ and confirm the output level. If there is a residual voltage or residual current compared with the output of no load, take measures as follows

① Push a [AZ.R] button and reset AZ operation. Put some load on Load Cell and let the output level to be 1.5V～2.0V or 8.8mA ～10.4mA and turn power OFF.
(Instead of adding a load on Load Cell, it is possible to change the output with turning a [CHECK] rotary switch while pushing a [CHECK] button. In this case, need to keep pushing a [CHECK] button.)

② Turn power ON while pushing a [AZ.R] button. It will be a span adjustment mode of AZ function. (LED [AZ] will blink faster than zero point adjustment mode of AZ function.)

③ In this situation, if the output is neither 0V nor 4mA, adjust the output to 0V or 4mA by pushing two buttons. Pushing a [AZ] button increase the output. Pushing a [AZ.R] button decrease the output. The output starts to change if keep pushing either of two buttons.
(When a [CHECK] rotary switch substitutes a load on Load Cell, adjust the output while keep pushing a [CHECK] button.)

④ Turn power OFF and turn it ON again without pushing any buttons.

⑤ Operate AZ with/without a load on Load Cell and confirm the output and check whether AZ operation performs properly.

5 – 4) Judgement if this unit is malfunction

1). Check excited voltage of Load Cell

Check whether the excited voltage between terminal No.1 (+EXC) and No.2 (-EXC) is stable at 10V ±0.5V *. If it is not stable, a power supply circuit inside this unit may be defective.
(* 10V is for standard. Specify EXC=5V±5% or EXC=2.5V±5% as option)

Please note that a sensor will be damaged or characteristic of a sensor will be not proper if the excited voltage exceeds the recommended excitation voltage of a sensor.

2). Short output voltage from Load Cell (jumper between terminal No.3 (+SIG) and No.4 (-SIG)).
In other words, the input voltage from Load Cell to this unit is made zero.

At this time, set a [TARE] rotary switch to '0' once. In this state, the voltage which adjusted by a [ZERO] trimmer is output, so the output does not become 0V, but it can check whether the output is stable.
If it is not stable, this unit may be defective. If it is stable, check Load Cell side.
Please restore the setting of a [TARE] rotary switch to the original position after checking.

5 – 5) Check Load Cell

Since Load Cell is composed of a bridge circuit, it is possible to make a rough judgement by measuring the input / output resistance and insulation resistance.

＊ Please be sure to turn OFF this unit before checking Load Cell.

1). Failure judgement method by Load Cell resistance value.

① Remove all Load Cell cables.

② Measure the bridge resistance of Load Cell with a tester and check if there is any abnormality in the input / output resistance.

2). Failure judgement method based on Load Cell insulation resistance.

① Remove all Load Cell cables.

② Measure the insulation resistance between shield and each cable of Load Cell at a voltage within 50V.
In addition, the insulation resistance between a metal case of Load Cell and each cable other than shield is also measured at a voltage within 50V.

③ If the insulation resistance is 1000MΩ or more, Load Cell is mostly good.

§6. Installation and connection method

6 – 1) Installation environment etc.

1). Operating temperature range of this unit is 0℃ ～ 40℃.
Consider installing in a place not exposed the direct sunlight.
2). This unit is operated with supplied voltage DC24V.
Note that connecting to a different voltage may cause failure or damage.
3). Please fix this unit using the base plate with 2-Φ4.

6 – 2) Terminal connection

Wiring to this unit is done with 5mm pitch 15p terminal block. The shield line of each cable shall be grounded by either this unit or each connected instrument, so that there is no ground loop.

1). Load Cell, Output, AZ and Power line connection

Terminal block for 5mm pitch crimped terminal

No.	Connecting Signal	
1	+EXC	Excitation voltage to Load Cell (+)
2	−EXC	Excitation voltage to Load Cell (−)
3	+SIG	Input signal from Load Cell (+)
4	−SIG	Input signal from Load Cell (−)
5	SHL	Shield line of Load Cell cable
6	+OUT	Output signal (+)
7	−OUT	Output signal (−)
8	AZ	Auto Zero input (Contact point input)
9		
10	SET−C	Answerback output (Collector)
11	SET−E	Answerback output (Emitter)
12	SHL	Shield line of AZ cable
13	E	Earth (Grounding)
14	+24V	Power line (DC20～27V)
15	0V	Power line (0V)

The shield of the output signal should be grounded on the receiving device side.

※ Applicable wire range:
Single wire: Φ0.4mm ～ Φ1.2mm (AWG26～16)
Strand wire: 0.2mm^2 ～ 1.25mm^2 (AWG24～16), wire OD≧Φ0.18mm
A peeled line length of the both single wire and strand wire are 11mm.

2). Precaution of connection

① The shield of each cable should be grounded at either this unit or each connected instrument so that ground loop cannot be formed.

② Cable color of Load Cell or a sensor is different from the manufacturers. Please check the cable color written in Test report attached with Load Cell.

③ In case of not grounding shield line at connected instrument side, please use No.13 terminal (Grounding) of this unit.

④ Regarding of extension of analog output cable, the cable length depends on an environment of routing it. But an aim of cable length is 5m or less specially for voltage output cable.

⑤ In general Load Cell, cable shield of Load Cell is not connected to a metal case of the Load Cell. If the ground potential of this unit is different from the potential of Load Cell metal case, it is easy to be affected by inductive noise.
Therefore, make sure that metal case of Load Cell is same potential as metal case of this unit by a grounding cable.

§7. List of Models and Accessories

7 – 1) Model

LA–1025A–1–EXC5V–100Hz

- Filter characteristic
  - Blank : 2Hz
  - xxHz : Select from 5,10,20,50,100, 200,500Hz,1kHz (OP)
- Load Cell excitation voltage
  - Blank : 10V
  - EXC5V : 5V (OP)
  - EXC2.5V : 2.5V (OP)
- Output specification
  - 1 : 4～20mA Current output
  - 2 : 0～±5V Voltage output
- Product model name

※Modification of Load Cell excitation voltage and filter characteristics is optional (OP) at the factory.

7 – 2) Attached accessory

Operation manual 1 copy

§8. Specifications

8 – 1) Power supply part for Load Cell

1). Excitation voltage:	DC10V±5% as standard (DC5V±5%, DC2.5V±5% as option)
2). Number of connectable sensors:	4 sets of 350Ω type Load Cell (120mA maximum) (EXC=5V is 60mA, EXC=2.5V is 30mA)

8 – 2) Amplifier part ・ I / O part

1). Input range:	±3.3mV/V (sum of tare amount and measuring weight)
2). Initial Tare elimination:	0～2.25mV/V (0.15mV/V step, 16 position rotary switch)
3). Zero adjustment:	approx. ±0.1mV/V (Coarse, Fine: 15 rotating trimmer)
4). Auto Zero (AZ) range:	±2.0V or 0～10.4mA After Tare elimination adjustment, if the output is within the above range, the output can be corrected to 0V or 4mA by Auto Zero (AZ) function AZ is performed by pushing a [AZ] button on this unit or external [AZ] contact input. Reset AZ is performed by a [AZ.R] button of this unit.
5). Sensitivity adjustment:	Amplification variable range: ×1667～×151 (twice the above at EXC=5V, 4 times at EXC=2.5V) Span of 0.3～3.3mV/V can output 4～20mA or 0～5V (if span of 0.6mV/V or more, 0～10V can be output) Standard sensitivity : Output 0～5V or 4～20mA when EXC=10V, 0～1mV/V input, Gain=500 times
Range:	Rotary switch (8 position)
Span:	Multi-turn trimmer adjustment (Coarse, Fine adjustment: 15 rotations each)
6). Output signal	
Current output :	4 to 20mA load resistance ≦ 510Ω (LA-1025A-1)
Voltage output :	0 to ±5V load resistance ≧ 2kΩ (LA-1025A-2) Voltage output is bipolar output. For spans of 0.6mV/V or more, output of 0 ～±10V is possible.
7). Non linearity:	±0.05%FS (±0.1%FS when EXC=2.5V)
8). Filter characteristic:	fc = 2Hz±20% (−3dB), −12dB/oct. Low pass filter fc = 5, 10, 20, 50, 100, 200, 500Hz, 1kHz as option
9). Temperature coefficient:	
Zero:	±0.01% FS/℃ typ. (at standard sensitivity) (twice the above at EXC=5V, 4 times at EXC=2.5V)
Sense:	±0.01% FS/℃ typ. (±0.02% FS/℃ typ. at EXC=2.5V)
10). Check function:	A pseudo input signal can be generated by pushing a [CHECK] button switch. It is added to the input signal. Can be set to about 2.25mV/V in about 0.15mV/V step. (temperature coefficient: 25ppm / ℃ maximum)
11). Operation switch:	Pen touched operation of two buttons for AZ, AZ.R
[AZ]	Auto Zero operation
[AZ.R]	Auto Zero Reset operation
12). External command input:	1 bit (AZ) One shot Make contact (pulse width 0.2 second)

13). Output for controller: 1 bit (SET)
Open Collector negative logic output,
(photo coupler insulation, NPN transistor)
Emitter ～ Collector ON when signal output.
Rating : DC30V, 30mA (resistive load)
Emitter ～ Collector saturation voltage : 1.2V or less
Uses Toshiba photo coupler TLP 127 or the equivalent.

8 – 3) Analog Auto Zero

1). Auto Zero (AZ) function

By a button operation (keep pushing a [AZ] button for 3 seconds) or external command input (0.2s one-shot Make contact signal), set the output level within ±2.0V or 0～10.4mA to 0V or 4mA, and output increasing or decreasing amount from that point
(It memorizes the output level as the offset level at the time of a [AZ] button or command input, and after that always subtract the offset level from the output level.)
LED [AZ] turn ON during AZ operation.
Reset (cancel) of AZ function by pushing a [AZ.R] button. (keep pushing a [AZ.R] button for 3 seconds.)

・Auto Zero setting time: 0.2 second or less
・Auto Zero resolution: within 500μV or 1.6μA
・Erasing accuracy: within ±2mV or 4mA±6.4μA
(Max. residual output voltage or current during AZ operation)

・Precaution: Please remind the output level should be stable in 0.5 second before a [AZ] button or command input.

・Out of AZ range: When a [AZ] button or command input, if the output exceeds the AZ operation range, ignore the input and a LED [AZ] flashes ON and OFF as an error indication.
An error is kept to indicate until the next effective input.

・Memory Retention: Data related with AZ operation are written in the non-volatile memory (F-RAM) and AZ operation is continued even if the power is turned OFF and ON.

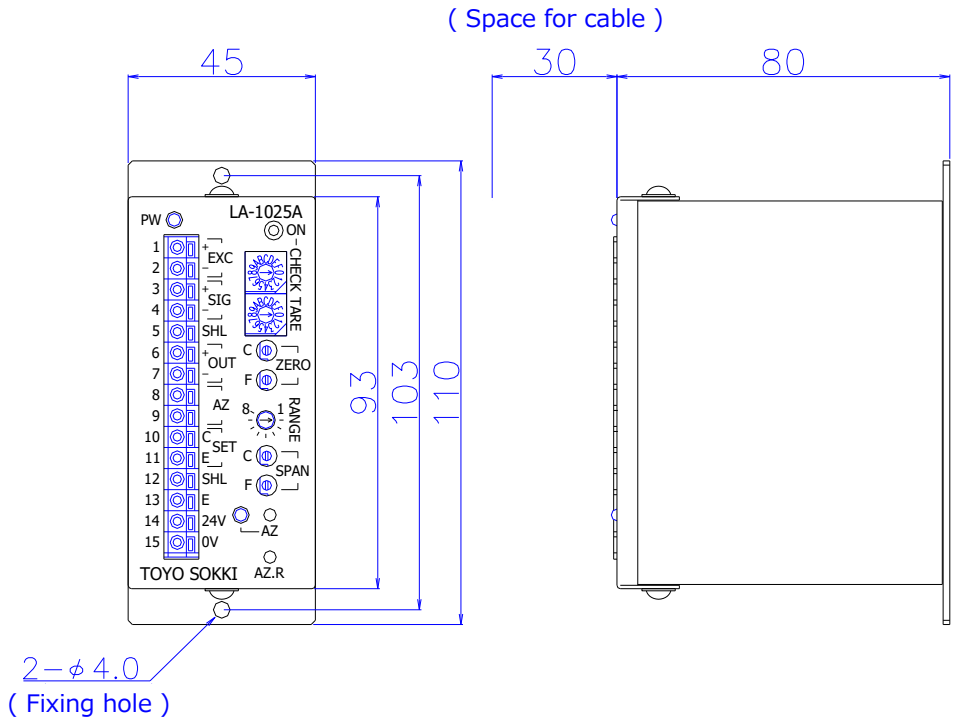
2). Answer back (SET) function

When a [AZ] external command is input, if the process is carried out successfully, [SET] signal is turned ON for 0.2 second as positive response (Open Collector signal)
If the output exceeds AZ operation range, ignore the command and do not turn ON [SET] signal. In addition, a LED [AZ] flashes ON and OFF as an error indication.

8 – 4) General

1). Power stability: ±0.02%FS (at power source voltage fluctuation ±10%)
2). Power supplied voltage: DC24V (DC20～27V)
3). Consumption current: 0.5A typ. (power source needs a margin more than double in order to support a plunge current at the time of power ON)
4). Operating Temp. & Humidity: 0～+40℃, 20～85% R.H. (no condensation)
5). Storage Temp. & Humidity: −20～+60℃, 20～85% R.H. (no condensation)
6). Mass: approx. 0.7 kg
7). Installation method: Wall mount method,
Fix with 3M screw by using 2−Φ4 of main base metal

§9. Dimensional Drawing



§10. Functional Block Diagram