Instruction Manual

Analog converter

typed

EX30AR-I/V

【Principal features and benefits 】

① Such sensor signals as number of revolution, peripheral velocity, passing time, speed meter, etc., can be converted to analog signal in terms of pulse input.
- The type of EX30AR-I outputs the instantaneous flowrate at the current value of 4-20mA.
- The type of EX30AR-V outputs the instantaneous flowrate at either of voltage values of 0-5V, 1-5V, 0-10V and 1-10V(Configured at factory shipment).

② Taking advantage of the two staged comparative output functions, it can control upper/lower limit controls, lower/lower limit controls and upper/upper limit controls(Configured at factory shipment).

③ It outputs comparative output at the relay contact(contact c).

④ It can be driven at 24VDC(at direct current).

⑤ Sensor drive power supply to be externally connected is supplied at 5VDCand 10mA.

⑥ Outside dimensions are 30(H) x 30(W) x 26.2(D) mm and compact in size.

⚠ Warning

Since this Instruction Manual contains important instructions for use, please read this Instruction Manual with caution for your safety operation, before use.

① Do not use this analog converter, EX30AR-I/V as the main loop controlling devices for use in a medical equipment which have a direct effect on the human lives, devices for space, atomic power control machine, military marine vessel and chemical apparatus for the military purpose regulated under control in " Export Trade Control Ordinance".

② Care must be taken not to exceed the rated power supply(24VDC±10%), and the wiring work should be done after turned off power. If not, it may cause malfunction, damage to the device or fire.

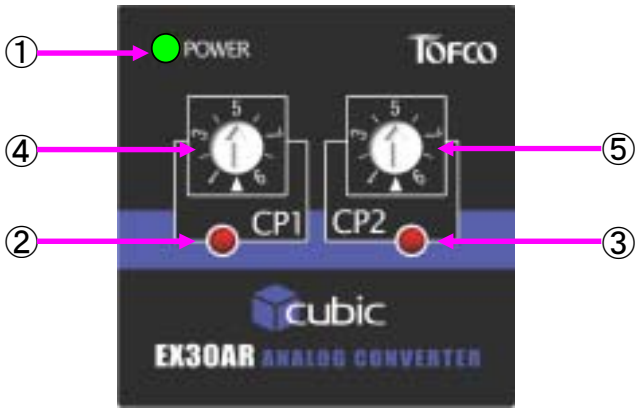
③ Avoid using in the following locations. If not, it may cause danger in life by Fire, explosion and damage to the devices.
- In location where the corrosive gases and flammable gases will occur.
- In locations where water and oil splash and where there are much dust, metal powder and saline.
- In a location where is subjected to the direct sunlight and where ambient temperature range between 0℃ and +55℃ is exceeded.
- In locations where is high in humidity, where temperature change occurs abruptly and where condensation of humidity will occur.
- In a location where is strong in vibration and impact shock.
- In a location where is in the vicinity of the devices which produce strong electromagnetic noises and high frequency noises.

⚠ Precaution before use (Input/output signal lines)

① Do not connect any noise-generating devices to the output pin for use in sensor at +5V of power supply.

② Avoid wiring together with such strong noise sources as power line, relay, electromagnetic valve and solenoid operated valve. If not, it may cause malfunction due to induction.

1. Explanation of the appearance and how to operate



	Part names	Functions
①	Power supply indicator	Lights up when turning on power.
②	CP 1 indicator	Lights up when CP 1 of comparative output is outputted and also blinks at intervals of 0.5 seconds when the measuring input has been exceeded the measuring range.
③	CP 2 indicator	Lights up when CP 2 of comparative output is outputted and also blinks at intervals of 0.5 seconds when the measuring input has been exceeded the measuring range.
④	Setting dial for CP 1	Sets the operating point on CP 1 of comparative output.
⑤	Setting dial for CP 2	Sets the operating point on CP 2 of comparative output.

【 How to set the setting dial of comparative output 】

① The dial setting value is the one that is obtained from dividing the max flowrate into ten and multiplying the number of the dial position.
[For setting example]:
Suppose that the max flowrate is 100L/min and that the dial position is at 5, the computation is as follows :

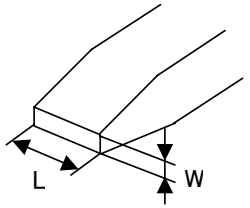
(100÷10) x 5 = 50L/min

② If making the dial position set at "△", the comparative output function will turn off, and will not operate.

※ The information regarding how to operate the comparative output of CP 1 and CP 2 (to select the way at which the alarm is produced either when the flowrate is more than the setting value or when the flowrate is less than the setting value) has been configured at the factory shipment.

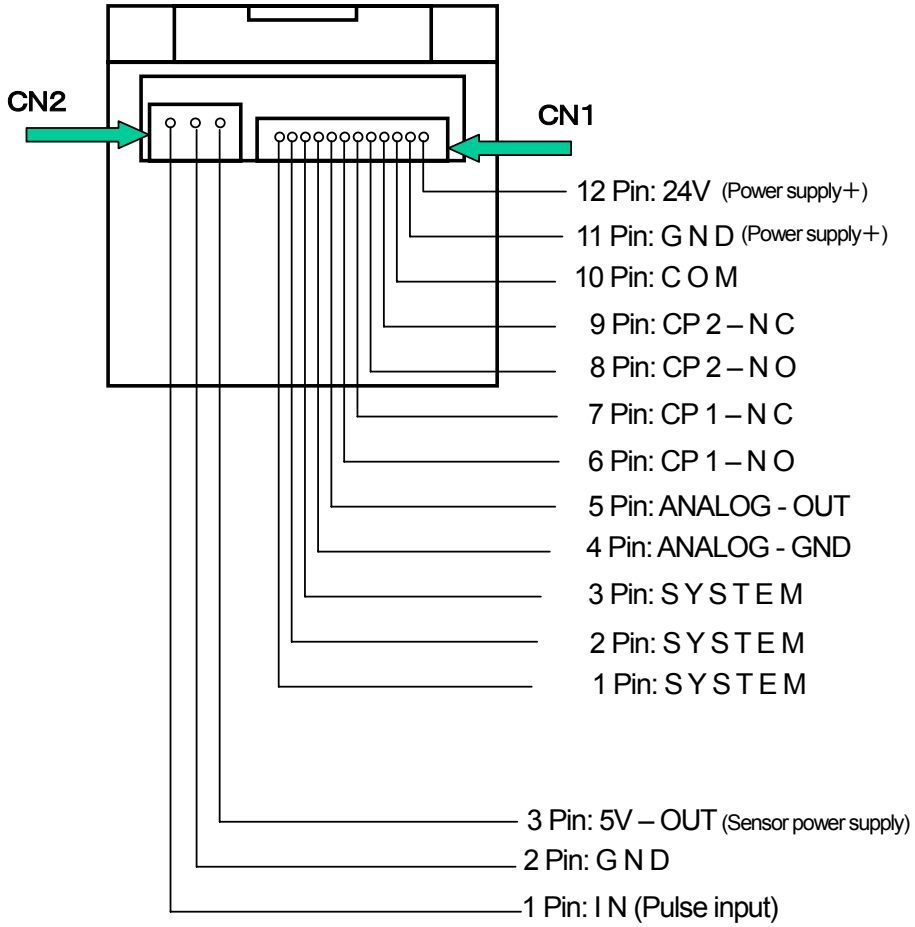
【 A slotted screwdriver for adjusting 】

Use the slotted screwdriver for adjusting the dial setting attached.
If using any slotted screwdriver other than one attached, it must be the precision screwdriver (−) at the end as illustrated below.
※ A care must be taken for when using the slotted screwdriver with a large handle to grip or the one which is extremely small at the end, because it may cause damage to the setting groove.



Width (L) at the end of slotted screwdriver	2.0 – 2.4 mm
Thickness (W) at the end of slotted screwdriver	0.5 – 0.6 mm

2. Explanation for external input/output pins



● CN 1
Applicable connector
Made by J. S. T. Mfg. Co., Ltd.
Housing : SHR-12V-S
Contact : SSH-003T-P0.2
Applicable electric wires : AWG32 – 28
Wire coating outer diameter : ϕ0.4 – 0.8

Crimping tools
Made by J.S.T. Mfg. Co., Ltd.
Crimping tool : YRS-859

● CN 2
Applicable connector
Made by J. S. T. Mfg. Co., Ltd.
Housing : PHR-3
Contact : SPH-002T-P0.5S
Applicable electric wires : AWG30 – 24
Wire coating outer diameter : ϕ0.9 – 1.5

Crimping tools
Made by J.S.T. Mfg. Co., Ltd.
Crimping tool : YRS-240

3. How to wire

Caution

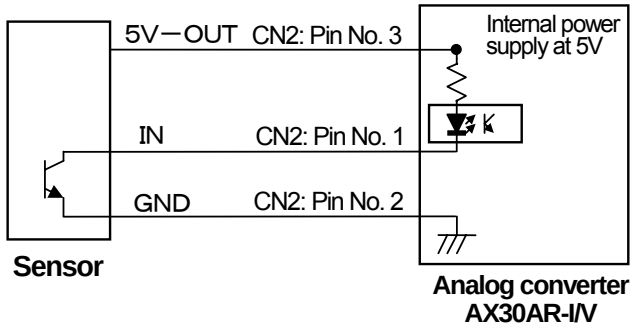
- Wiring work should be done after turned off power supply. If not, it may cause damage to the device.
- The wiring of this device should not be wired together with the power supply lines and the power lines.
- This device does not meet the water proof specification. Avoid using in a place where water will splash.

Power supply

The pins for connecting to the power supply are Pin No. 11 and 12 in CN1.
Use the voltage within 24VDC±10% and also use power which does not generate noises as much as possible.

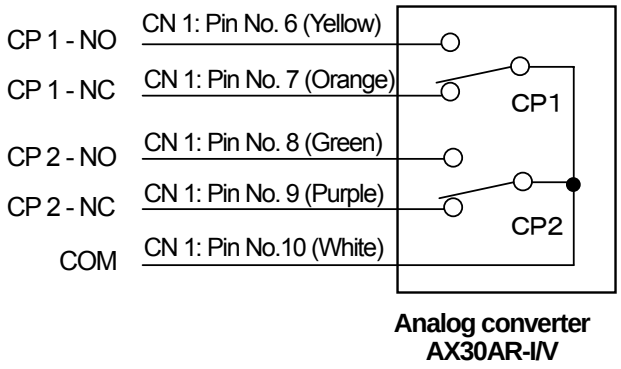
Sensor input

The pins for connecting to the power supply for use in sensor is Pin No.3 and 2 in CN 2.
The voltage is 5VDC±10%. Current capacity is 10mA at max.
Do not connect any load over 10mA.



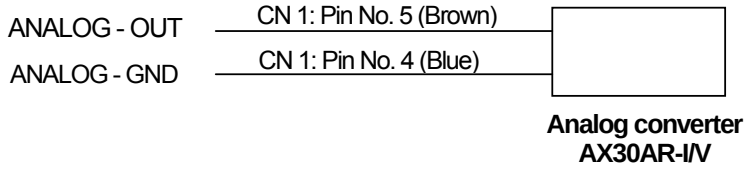
Comparative output

The connections to CP 1 are Pin No. 6, 7 and 10 in CN 1.
The connections to CP 2 are Pin No. 8, 9 and 10 in CN 1.
The max voltage to be impressed to the comparative output is 30V.
Also in no event run the current exceeding the range of 100mA.



Analog output

The connections to analog output are Pin No. 4 and 5 in CN 1.
Load resistance to EX30AR-I(Current output type):
Use it less than 300Ω and to EX30AR-V(Voltage output type) :
Use it more than 5KΩ.
Also do not connect the capacitive and inductive loads.



4. Specifications

Requirements		Conditions	Specifications
Measuring input	Input form	—	Single end input(Isolation from power supply)
	Pulse input	—	Driven by open collector output Input response frequency:0-300Hz(Dutv50%)
	Permissible overinput	—	35VDC
	Pulse measuring form	—	Periodic measurement form
	Periodic measurement sampling	—	0.1 to 0.2 seconds * Configured at factory when shping.(Sampling time extended in lowpass frequency by input frequency)
Display	Power supply display	—	When power "ON": Green LED is lit up.
	Comparative output display	—	When comparative output turned "ON", orange LED is lit up.
	Overflow display	—	Comparative output display LED blinks.
Comparison	Comparative operation	—	Upper/upper limit, upper/lower limit, lower/lower limit ※Configured at factory shipment
	Setting of comparative value	Two staged setting	off /10 – 90% of max flowrate (at unit of 10%)
	Comparative output	—	Relay output(Contact c) Output impressed voltage: 30V and below Current: 100mA and below
Func-tion	Power failure assurance	—	Stores the setting data in EEPROM Writable number of time: One million times Retention period: Approx 10 years
Power Supply for sensor	Output voltage	Ta=23℃ ±5℃	5VDC±10%
	Output current	—	Max 10mA
Supply power	Voltage	—	24VDC±10% (Nonisolation from power supply)
	Current	EX30AR-I	Approx. max. 65mA(Inrush current less than 2.9A)
		EX30AR-V	Approx. max. 40mA(Inrush current less than 2.9A)

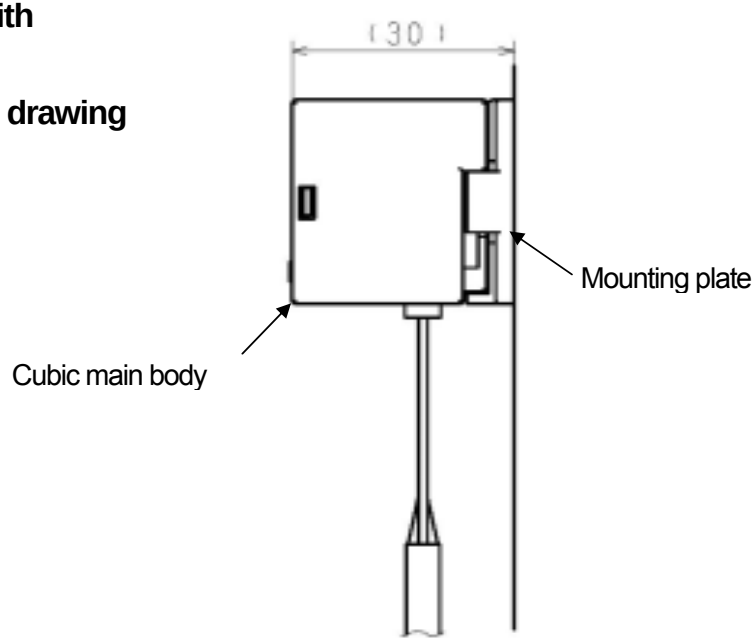
Requirements		Conditions	Specifications
Analog output	Voltage output	—	0 – 5 V / 1 – 5 V / 0 – 10 V / 1 – 10 V ※Output form configured at factory shipment ※Load resistance should be more than 5KΩ. ※Output accuracy: ±0.1V ※Residual output at 0V: Max 30mV
	Current output	—	4-20mA ※Load resistance shall be less than 300KΩ. ※Output accuracy: ±0.2mA
Environ-ment	Operation temperature	—	0 – 55 ℃
	Relative operation humidity	—	35 – 85 % RH(Non condensing)
	Storage temperature	—	−20 – +70℃
Others	Withstand noise	24VDC VS 0V Power vs panel Panel vs COM	Power supply line: 800V(Normal mode power supply noise) Common mode: 600V(Common mode power supply noise) Common mode:600V(Common mode noise)
	Withstand voltage	Power supply vs Alarm output Charging part collectively vs Case	500VAC for one minute
	Insulating resistance	Power supply vs Alarm output Charging part collectively vs Case	500VDC measured by megger 20MΩand more
	Vibration proof	—	Number of vibration:10 – 55 Hz Vibration of amplitude:1.5mm Each direction to XYZ for 2 hours, Sweep time for one minute. (JIS-C0911-1984)

Requirements		Conditions	Specifications
Others	Crash proof	–	Intensity of crush: 294m/s^2(Approx 30G) Shock pulse action time: 11mS Six direction as X, Y and Z for three times(JIS-C0912-1984)
	Outside dimensions	—	30(H)x 30(W) x approx 26.2(D)mm
	Weight	—	Approx 20g
	Case	–	Made from plastic mold

5. Explanation for mounting plate

1. To begin with

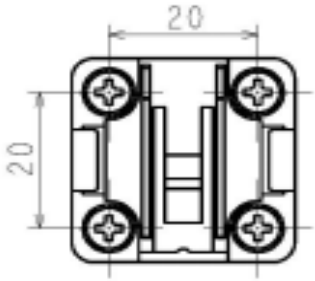
● **Assemble drawing**



2. How to mount

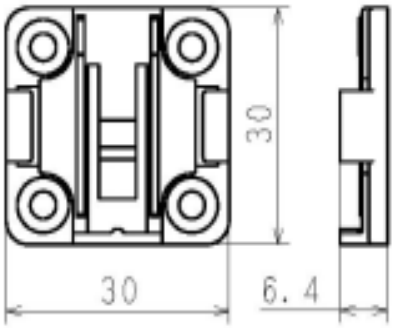
① Use screws for secure the mounting plate.
② Insert so as to fit the rear groove of the Cubic main body into the hook nail on the mounting plate.
③ Push the Cubic main body into the place until it click.
④ Connect the connectors or cables.

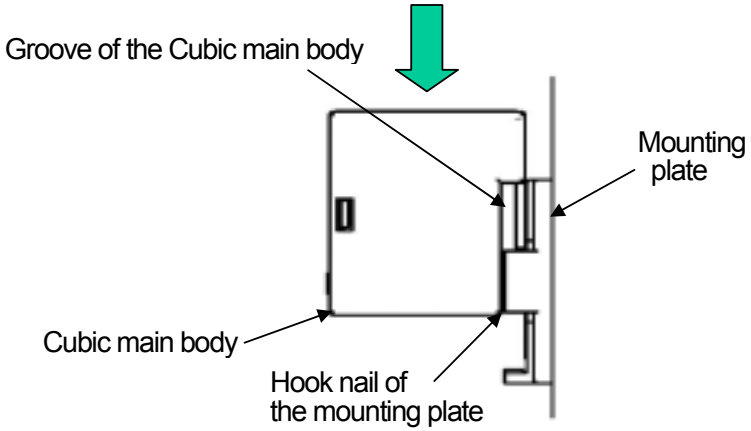
● **Mounting screw pitch**



Recommended screws:
Countersink tapping screw
(Second class with groove sized M3)

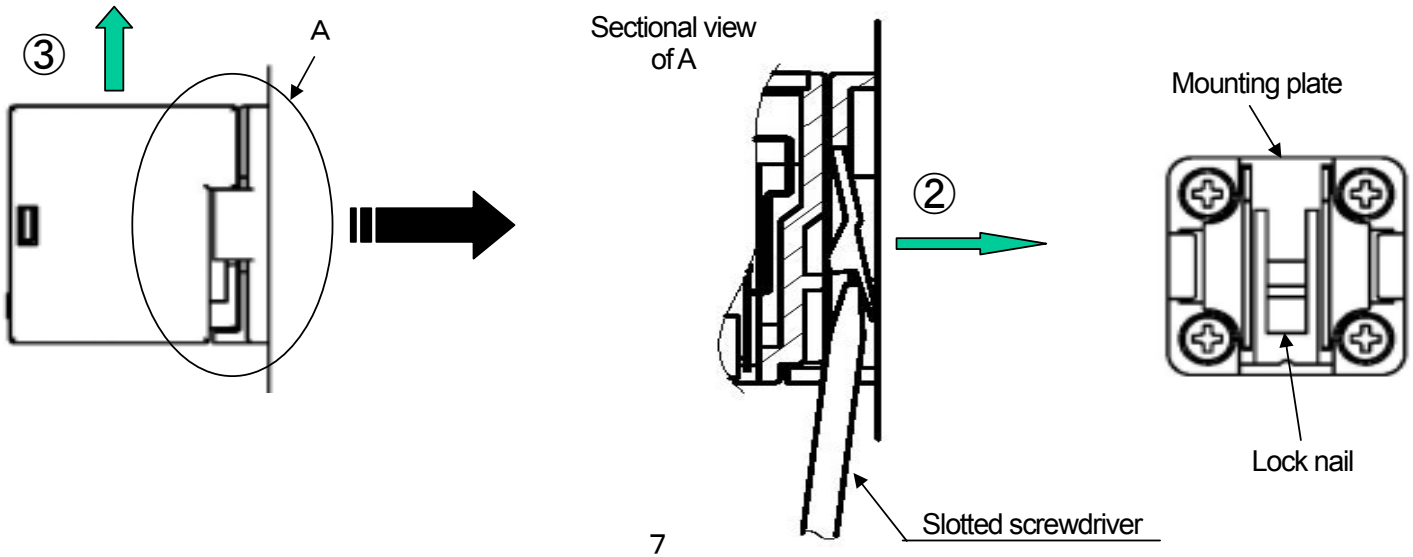
● **Mounting plate**





3. How to remove

① Remove the connectors and cables.
② Push the lock nail of the mounting plate into the arrow direction ② illustrated below by using a slotted screwdriver from the beneath the mounting plate.
③ Remove the Cubic main body to the arrow direction of ③ holding the lock nail in the status of ②.



6. Warranty

- The warranty period of the product shall be one year commencing on the date of delivery.
  We will repair or replace any failed prooduct occurred during this period which is obviously liable for us at a cost of no charge.
- As to how to repair, you are kindly requested to send back the faulty product to our company and to let us do the take –back repair.
- In case of the failure pertinent to the following items it shall not be covered by warranty.
  - ① The secondary loss arising from the failure of this product (such as damage to equipment, passive damages and the like) and any other damages shall not be covered by warranty.
  - ② Any failure caused by abuse or improperly handling by user side.
  - ③ Any failure caused by other reasons except for the liability for which we are liable.
  - ④ Any failure caused by remodeling or repairing except done by our company.
  - ⑤ Any failure due to unpredictable reasons considering from the level of technology at the time when shipping the product.

7. Where to contact

TOFLO CORPORATION

Headquarters: 3-17 Minamidaira, 4-chome Hino City, Tokyo 191-0041
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