Rotary Encoder

# PSC

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

**MAIN PRODUCTS**
- DIGITAL : Temperature Controller, Counter, Timer,Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Switch/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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HANYOUNG NUX

## ■ Safety information

### ⚠ CAUTION

1.Before using the product you purchased, make sure that it is exactly what you ordered.
2. Make sure that there is no damage or abnormality of the product during the delivery.
3. The transmitter for measuring the length is composed of precision parts, so can easily be damaged with external impact, therefore handle with care.
4. The shield wire of the transmitter for length measurement is not connected to the case.
5. When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
6. For the continuous and safe use of this product, the periodical maintenance is recommended.
7. If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.

### ■ On Mega Test

An internal pressure of 500V DC exists between the Case and the electric circuit, however, there are dangers of damage the electrical circuit if voltage is applied accidentally, so do not perform mega tests.

### ■ On Installation

1. During installation, do not apply impact on or twist the shaft of the transmitter for length measurement.
2. During installation, do not apply excessive force when combining the shaft of transmitter for length measurement and the instrument.
3. During installation, take caution because the life span of the transmitter for length measurement is dependent on the usage condition and the environment.
4. Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric shock or fire.
5. Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.

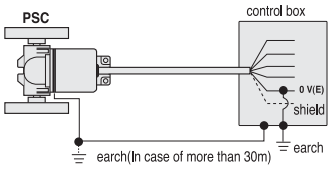
### ■ About Wiring

1. Separate an input signal cable from an output signal cable. If separating is not possible, please use the input signal cable after shielding it.
2. If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended.
3. Do not connect anything to the unused terminals.
4. After checking the polarity of terminal, connect wires at the correct position.
5. As for wiring, ensure they are as short as possible.
6. Having the same pipe for wiring of the transmitter for length measurement with the power line or an identical connection could cause malfunction, therefore please take caution.
7. Wrong connection of the wiring of transmitter for length measurement may damage the internal circuit. Please take sufficient caution.

### ■ About vibration

1. If intense vibration or impact is applied on the transmitter for length measurement, the wrong pulse is generated causing malfunction, therefore, absolute care is necessary when selecting the installation and disposition location.
2. As much as the amount of pulse per cycle, the slit gap of rotation slit is narrower, therefore can be easily affected by vibration, and the vibration applied during slow rotation or when stationary, may get transmitted to the shaft or the main body, causing wrong pulse generation, therefore, please take caution. The vibration applied to the transmitter for length measurement can become a cause for wrong pulse generation, so please take caution in terms of installation location or location for attachment.

### ■ For noise prevention




| Distance from control box | Wiring of PSC |
|---|---|
| Below | As for PSC Case, connect on the control board case by 3~5.5MM electric wire. For the 0 V terminal, connect on the control board case with identical type of electrical wire and earth it. |
| Above | Perform as indicated above, and earth the PSC. |

※ The caution on the safety stated above, must be kept, otherwise malfunction can be induced.

## ■ Specification

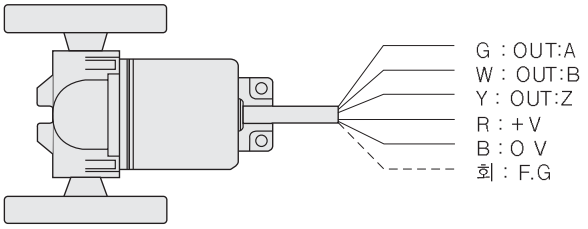
| | | | | |
|---|---|---|---|---|
| Model | | PSC-MA-AB-N<br>PSC-MB-AB-N<br>PSC-MC-AB-N<br>PSC-YA-AB-N<br>PSC-YB-AB-N<br>PSC-YC-AB-N | PSC-MA-AB-O<br>PSC-MB-AB-O<br>PSC-MC-AB-O<br>PSC-YA-AB-O<br>PSC-YB-AB-O<br>PSC-YC-AB-O | PSC-MA-AB-T<br>PSC-MB-AB-T<br>PSC-MC-AB-T<br>PSC-YA-AB-T<br>PSC-YB-AB-T<br>PSC-YC-AB-T |
| Output type | | NPN voltage Output | NPN Opencollector | Totem Pole Output |
| Electrical specification | Output phase | A phase, B phase (※PSC-MB-□□-□,PSC-MC-□□-□,PSC-YC-□□-□ are available with Z phase output) | | |
| | Phase difference of output | Phase difference between A and B phase : T/4±T/8 (1 cycle of A phase = T) | | |
| | Max. response | 180 ㎑ | | |
| | Power voltage | 5-24 V d.c (± 10 %) | | |
| | Power Consumption | Max. 60 mA | | |
| | Connection type | WIRE Connection | | |
| | Control Output | • Load Voltage : Max. 30 V<br>• Load Current : Max. 30 mA<br>• Remaining voltage : Max. 0.4 V | | • LOW<br>· Load Current : Max. 30 mA<br>· Remaining voltage : Max. 0.4 V<br>• HIGH<br>· Load Current : Max. 10 mA<br>· Remaining voltage : Min. 1.5 V |
| | Response speed | Max. 1 ㎲ (Wire length: 2 m, $I_{SINK}$ = 30 mA) | | |
| Mechanical specification | Moving torque | Max. 200 g.f.cm (19600 uN.m) | | |
| | Shaft inertial moment | Max. 800 g.cm$^2$ (8 × 10$^{-6}$ kg.m$^2$) | | |
| | Shaft allowable load | Radial : Below 0.1 ㎜, Thrust: Below 0.2 ㎜ | | |
| | Max. allowable revolution | 5000 rpm | | |
| | Life span of bearing | 1.2 × 10$^8$ / rpm: Time | | |
| Insulation resistance | | Min. 500 ㏁ (Between all terminals and case) | | |
| Dielectric strength | | 500 V a.c (Between all terminals and case for 1 minute at 50 ㎐) | | |
| Vibration | | 10-55 ㎐ (for 1 minute cycle), double amplitude width: 1.5 mm, in each direction of X · Y · Z for 2 hours | | |
| Shock | | Max. 75 G | | |
| Operating ambient temperature | | -10 ~ 60 ℃ (Without freezing), Storage: -25 ~ 85 ℃ | | |
| Operating ambient humidity | | 35 ~ 85 % R.H. | | |
| Protection | | IP 50 (IEC Standard) | | |
| Cable | | 5P, Ø 6.0 ㎜, Length: 2 m (Shielded cable) | | |
| Weight | | About 657 g | | |

## ■ Product Classification

PSC — MA — AB — T

| Model | Min. measuring length | Output phase | Output |
|---|---|---|---|
| Wheel type Rotary Encoder (INCREMEN-TAL TYPE) | • MA: 1 m<br>• MB: 1 ㎝<br>• MC: 0.1 ㎜<br>• YA: 1 YARD<br>• YB: 0.1 YARD<br>• YC: 0.01 YARD | • AB: A, B Phase | • N: NPN voltage output<br>• O: NPN open collector output<br>• T: Totem pole output |

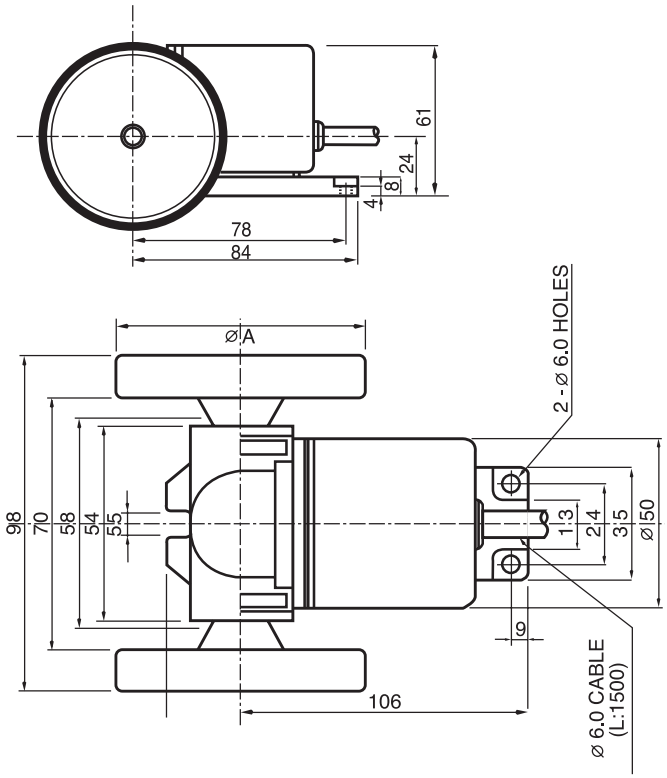
## ■ Connection




※ **Shield wire is not Connected to enclosure**

## ■ Dimension

[Unit: mm]



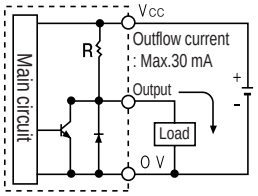

## ■ Product Classification

| Model | Measuring Unit | Ratio of gear | Wheel girth | Pulse/Slit |
|---|---|---|---|---|
| PSC-MA-□□-□ | 1 m | 4:1 | 250 ㎜ | 1 Pulse |
| PSC-MB-□□-□ | 1 ㎝ | 4:1 | 250 ㎜ | 100 Pulse |
| PSC-MC-□□-□ | 1 ㎜ | 2:1 | 250 ㎜ | 1000 Pulse |
| PSC-YA-□□-□ | 1 YARD | 4:1 | 228.6 ㎜ (0.25/Yd) | 1 Pulse |
| PSC-YB-□□-□ | 0.1 YARD | 4:1 | 228.6 ㎜ (0.25/Yd) | 10 Pulse |
| PSC-YC-□□-□ | 0.01 YARD | 4:1 | 228.6 ㎜ (0.25/Yd) | 100 Pulse |

## ■ Control output circuit

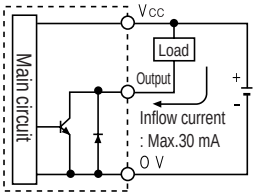
NPN Voltage output

| Encoder circuit | External connection example |
|---|---|



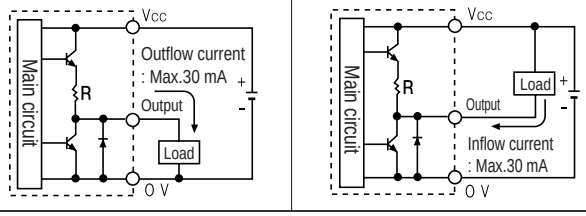

NPN Open collector output

| Encoder circuit | External connection example |
|---|---|




Totem Pole output

| NPN voltage output | | NPN Open collector output | |
|---|---|---|---|
| Encoder circuit | External connection example | Encoder circuit | External connection example |




## ■ Output wave

■ NPN voltage Output, NPN open collector output, Toten Pole output

| Output | Direct rev. | Reverse rev. |
|---|---|---|
| OUT A | H / L, T, T/2 ± T/4 | H / L |
| OUT B | H / L, T/4 ± T/8 | H / L |
| OUT Z | H / L, T ± T/2 | H / L |

* CW : Direct rev. is clockwise in shaft position
* CCW : Counterclockwise in shaft position-Reverse revolution