

Multi Pulsemeter

RP series

INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG NUX CO.,Ltd. Product.
Please check whether the product you purchased is the exactly same as you ordered. Before using product, please read instruction manual carefully.

HANYOUNG NUX



HANYOUNGNUX CO.,LTD

1381-3, Juan-Dong, Nam-Gu Incheon, Korea

TEL: (+82-32)876-4697 FAX: (+82-32)876-4696

HEAD OFFICE

Safety Information

Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

	DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
	WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
	CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

Danger

Do not touch or contact the input/output terminals because they may cause electric shock.

Warning

- This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating : 250 V 0.5 A)
- To prevent deflection or malfunction of this product, supply proper power voltage in accordance with the rating.
- To prevent electric shock or device malfunction of this product, do not supply the power until the wiring is completed.
- Do not decompose, modify, revise or repair this product. This may cause malfunction, electric shock or fire.
- Reassemble this product while the power is off. Otherwise, it may cause malfunction or electric shock.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

Caution

- The contents of this manual may be changed without prior notification.
- Before using the product you have purchased, check to make sure that it is

exactly what you ordered.

- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Check to make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with corrosive (especially noxious gas or ammonia) or flammable gas.
- Do not use this product at any place with direct vibration or impact.
- Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Pollution level 1 or 2)
- Do not polish this product with substances such as alcohol or benzene.
- Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- Install this product at place under 2,000 m in altitude.
- When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
- If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended.
- The noise filter must be attached to a panel grounded, and the wire between the filter output side and power supply terminal must be as short as possible.
- If gauge cables are twisted closely, the effect on noise may occur.
- Do not connect anything to the unused terminals.
- After checking polarity of terminal, connect wires at the correct position.
- When this product is connected to a panel, use a circuit breaker or switch approved with IEC847-1 or IEC947-3.
- Install the circuit breaker or switch at near place for convenient use.
- For the continuous and safe use of this product, the periodical maintenance is recommended.
- Some parts of this product have limited life span, and others are changed by their usage.
- The warranty period for this product including parts is one year if this product is properly used.

Specifications

Model		RP1	RP3	RP4	RP6	RP7
Power supply	a.c	100 – 240 V a.c 50 – 60 Hz				
voltage	d.c	–	24 – 60 V d.c / a.c			
Voltage fluctuation		±10 % of Power supply voltage				
Power consumption (Approximately)	a.c	10 VA	9.5 VA	12 VA	12 VA	9.5 VA
	d.c	–	5 W	6 W	5 W	5 W
Voltage for sensor		12 V d.c ±10 % 120 mA Max.				
Measurement accuracy		• Mode F1, F2, F3, F4, F5		± 0.02 % rdg ±1 dig		
		• Mode F6		± 0.1 % rdg ±1 digit		
Measurement range		• Mode F1		0.0003 ~ 10 KHz		
		• Mode F2		0.003 ~ 1000 Hz		
		• Mode F3, F4, F5, F6		0.001 s ~ 3,200 s		
		• Mode F7, F8, F9		0 – 4×10 ⁹ Count		
Input signal		Non Contact Input : 10 KHz Max.				
		(ON voltage : 4.5 V – 24 V, OFF voltage : 0 – 1.0 V)				
		Contact Input : 30 Hz Max.				
		(12 V d.c Able to switch the current of 2 mA sufficiently)				
Displayable digits max	4 digits 1 stage (0~9999)		5 digits 1 stage (0~99999)			
Display method		7 Segment				
Font	Width	6.3	8.3	4.6	7.6	7.6
size (mm)	Length	10	14	8	13.8	13.8
Display cycle		0.05, 0.5, 1, 2, 4, 8 sec				
Operation mode		F1 : Revolution/Frequency/Velocity, F2 : Moving velocity, F3 : Cycle F4 : Passing time, F5 : Time lag, F6 : Time width, F7 : Pulse width, F8 : Pulse interval, F9 : Addition counter				
Prescale		0.001 × 10 ⁻⁹ ~ 9.999 × 10 ⁹		0.0001 × 10 ⁻⁹ ~ 9.9999 × 10 ⁹		

Model	RP1	RP3	RP4	RP6	RP7
Other functions	• Auto Zero Time setting function • Time Unit Selection function • Parameter Lock function • Electricity Failure Compensation function (Applicable only to F9) • Start Compensation Timer function • Display cycle setting function • 10 steps memory for max, min, Peak function (max : 4 steps memory, average value memory, min : 4 steps memory, average value memory) • Comparative Output function (HH, H, GO, L, LL) : RP1, RP4, RP6 exception • Current Output Range Selection function (Applicable only to current output type) : RP1, RP4 exception				
Output	• Relay high limit output(H) • Relay output (HH, H, GO, L, LL) : RP1, RP4, RP6 exception • Transistor output (NPN open collector output : comparative alarm output) : RP1, RP4 exception • PV retransmission output (4 - 20 mA d.c) : RP1, RP4 exception • Relay output (H, GO, L) : RP1, RP4 exception				
Insulation Resistance	More than 10 M Ω (at 500V d.c) - Between electrically chargeable part and non-electrically chargeable part				
Dielectric Strength	2000V a.c 60 Hz for 1 minute (Between AC power terminal and case, between AC terminal and measurement input terminal)				
Noise Resistance	Square-shaped wave noise by noise simulator (Pulse width 1 μ s \pm 2000 V)				
Vibration	Durability	10 - 55 Hz double amplitude width 0.75 mm X \cdot Y \cdot Z each direction for 2 hours			
Resistance	Malfunction	10 - 55 Hz double amplitude width 0.5 mm X \cdot Y \cdot Z each direction for 10 minutes			
Shock	Durability	300 % (30 G) X \cdot Y \cdot Z each direction 3 times			
Resistance	Malfunction	100 % (10 G) X \cdot Y \cdot Z each direction 3 times			
Operating ambient temperature	-10 \sim 50 $^{\circ}$ C (Without condensation)				
Storage temperature	-20 \sim 60 $^{\circ}$ C (Without condensation)				
Operating ambient humidity	35 \sim 85 % R.H.				
Weight(approximately)	115 g	230 g	115 g	160 g	225 g

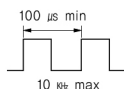
Suffix Code

Model Name	Suffix Code	Description
R P	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Multi Pulse Meter
Size	1	(W)48 × (H)24
	3	(W)96 × (H)48
	4	(W)48 × (H)48
	6	(W)72 × (H)36
	7	(W)72 × (H)72
Displayable Digits	4	4 digits 1 stage (0 – 9999) * applicable to RP1
	5	5 digits 1 stage (0 – 99999)
Power Supply	A	100 – 240 V a.c 50 – 60 Hz
	D	24 – 60 V d.c / a.c *Exception : RP1
Output Specification	RP1	N Display Only
		1 Relay 1 stage output (H : High limit output)
	RP3	N Display Only
		1 Relay 3 stages output (H, GO, L)
		2 Relay 5 stages output (HH, H, GO, L, LL)
		4 NPN Open Collector 5 stages output, 4-20 mA d.c(Retransmission output)
	RP4	N Display Only
		1 Relay 1 stage output (H : High limit output)
	RP6	N Display Only
		1 Relay 3 stages output (H, GO, L)
		3 NPN Open Collector 5 stages output, 4-20 mA d.c(Retransmission output)
	RP7	N Display Only
		1 Relay 3 stages output (H, GO, L)
		2 Relay 5 stages output (HH, H, GO, L, LL)
		5 NPN Open Collector 5 stages output, 4-20 mA d.c(Retransmission output)

Input Specification

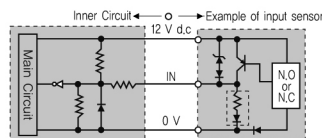
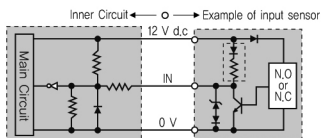
Input Specification

If the half-period of input frequency is more than 50us pulse, it can be detected steadily.

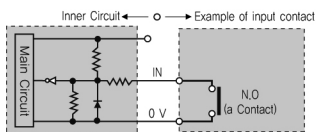


Input Type Selection (Selection of Input Sensor)

- **NPN** : NPN Normal Open
- **NPN** : NPN Normal Close
- **PNP** : PNP Normal Open
- **PNP** : PNP Normal Close



Contact Input Normal Open



Cautions when setting sensor

- Measured value is not available when sensor is not selected correctly. So please check the sensor type before connecting sensor.
- Example of sensor type selection
 - NPN** – Normally open, when closed due to the operation → (NPN N.O)
 - NPN** – Normally close, when opened due to the operation → (NPN N.C)

Output Specification

Contact Output

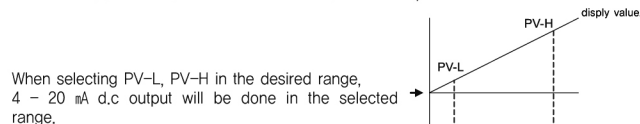
- Contact Capacity : 5 A 250 V a.c, 5 A 30 V d.c
- Electrical life – Open & Close under 250 V a.c 3 A(30 V d.c 3 A)100 thousand times
Open & Close under 250 V a.c 5 A(30 V d.c 5 A)50 thousand times
Speed of open and close : based on 20 times per minute.
- Mechanical life : 20 million times

Non Contact Output

- Rated load power consumption : 500 mW
- Output type : NPN Open Collector
- Load Voltage : 12 – 24 V d.c

PV Retransmission Output(4 – 20 mA d.c)

- Use : Transmit measured value to external equipment
- Function : Measured value which is measured within the selected range out of High output(PV-H) and Low output(PV-L) will be transformed to 4 – 20 mA d.c and it will be transmitted to external equipment.
- Setting range of High and Low output
 - High setting range (PV-H) : From minimum to maximum value within measuring range.
 - Low setting range (PV-L) : From maximum to minimum value within measuring range.
- (Notice : PV-H must be bigger than PV-L at least 1)
- Load resistance : 600 Ω max
- Resolution : 10,000



When selecting PV-L, PV-H in the desired range, 4 – 20 mA d.c output will be done in the selected range.

Resolution from PV-L to PV-H is set to 10,000. The setting value (The difference PV-H and PV-L) is smaller than resolution, error ratio will be going down.

Operation Mode

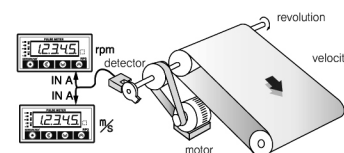
Mode F1 : Revolution(rpm) / Frequency(Hz) / Velocity (m/s)

- Revolution (rpm) = $f \times \alpha$ ($\alpha = 60$, default value)
- Frequency(Hz) = $f \times \alpha$ ($\alpha = 1$, setting value)
- Velocity(m/s) = $f \times \alpha$ ($\alpha = 1 \times L$)
- $L = \pi \times D$
- $L = L / N$ $f = 1 / T$
- ※ α : prescale value
- ※ N : number of form per 1 revolution
- ※ D : diameter of roller
- ※ L : moving distance when one pulse comes in
- ※ π : 3.141592
- ※ f : number of input pulse per second
- ※ L : circumference of roller
- ※ T : Time

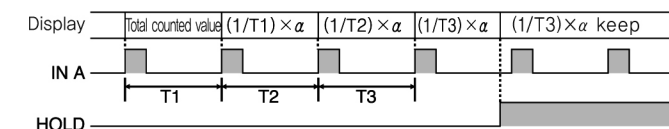
Example of practical application

Prescale example

Display value	Unit	Prescale value(α)
Revolution	rps	1
	rpm	60(default value)
Frequency	Hz	1
	KHz	0.001
	mm/s	1000 l
Velocity	cm/s	100 l
	m/s	1 l
	m/min	60 l
	km/hour	3.6 l



※ Default setting : rpm

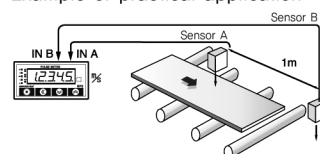


Mode F2 : Moving velocity(m/s)

It is a mode for measuring moving velocity. Sensor must be connected on Input A and B because it is a mode for measuring velocity from sensor input A to B.

- velocity(m/s) = $f \times \alpha$ ($\alpha = L$)
- $f = 1 / T$
- ※ α : prescale value
- ※ L : distance from sensor A to B
- ※ f : frequency
- ※ T : measured time from sensor in A to sensor in B

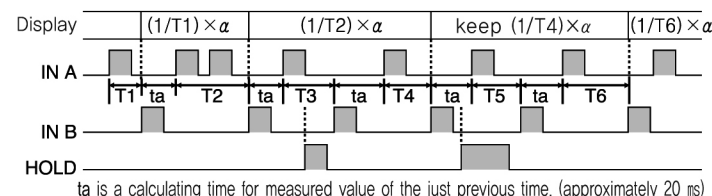
Example of practical application



● Default setting : m/s

Prescale example

display value	Unit	Prescale value(α)
velocity	mm/s	1000
	cm/s	100
	m/s	1(default value)
	m/min	60
	km/hour	3.6



ta is a calculating time for measured value of the just previous time. (approximately 20 ms)