

# Revolutions / Frequency Pulse Meters (Indicator)



## LR5N-B Series PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Features

- 1-pulse input per revolution
- Display up to 10,000 RPM
- Built-in internal battery (power supply not required)
- Display RPM or RPS of rotating shaft or disc
- AC voltage frequency display function
- IP66 protection structure (front panel)

### Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

**⚠ Warning** Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime / disaster prevention devices, etc.)**  
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
- 03. Install on a device panel to use.**  
Failure to follow this instruction may result in fire.
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.
- 05. Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
- 06. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.
- 07. Since lithium battery is embedded in the product, do not disassemble or burn the unit.**  
Failure to follow this instruction may result in explosion or fire.

**⚠ Caution** Failure to follow instructions may result in injury or product damage.

- 01. When connecting the measurement input, use AWG 24 (0.20 mm<sup>2</sup>) to AWG 15 (1.65 mm<sup>2</sup>) cable and tighten the terminal screw with a tightening torque of 0.98 to 1.18 N m.**  
Failure to follow this instruction may result in fire or malfunction due to contact failure.
- 02. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- 03. Use a dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in fire.
- 04. Keep the product away from metal chip, dust, and wire residue which flow into the unit.**  
Failure to follow this instruction may result in fire or product damage.

### Cautions during Use

- Follow instructions in 'Cautions during Use'.  
Otherwise, it may cause unexpected accidents.
- Keep away from high voltage lines or power lines to prevent inductive noise.  
The connection of this unit should be separated from the power line and high voltage line in order to prevent inductive noise.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

## Ordering Information

This is only for reference, the actual product does not support all combinations.  
For selecting the specified model, follow the Autonics website.

LR5N

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①

### ① Power

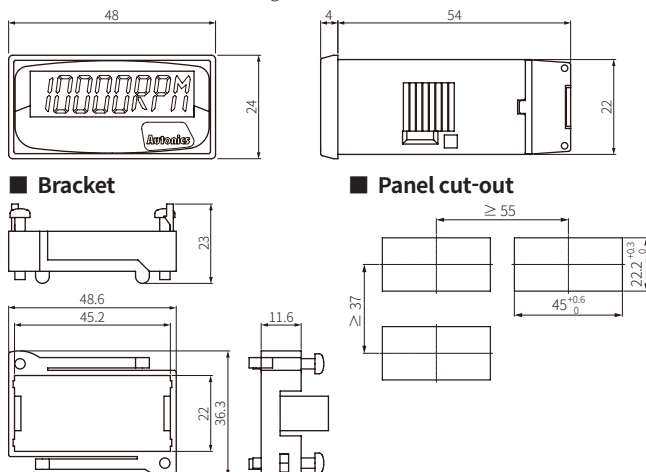
B: Built-in lithium battery

## Product Components

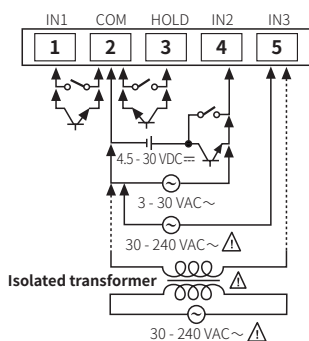
- Product (+ bracket)
- Instruction manual

## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.

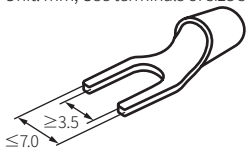


## Connections



### ■ Cautions during Wiring

- Unit: mm, Use terminals of size specified below.

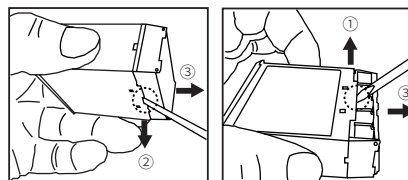


- Use reliable contact enough to flow 5  $\mu$ A of current when using contacts.
- Select one input among IN 1, IN 2, or IN 3.
- ⚠ **Precautions of Input IN3**  
When supplying high voltage over 50 VAC~ into IN3, use the isolation transformer with 1:1 turn ratio or set up the counter plan or it may cause electric shock.

## Specifications

<b>Model</b>	LR5N-B		
<b>Display digits</b>	4½-digit		
<b>Display type</b>	LCD Zero Blanking (character size: H 8.7 mm)		
<b>Input type</b>	IN 1: No-voltage input	IN 2: Voltage input 1	IN 3: Voltage input 2
<b>Input signal level</b>	Short-residual voltage : $\leq 0.5$ V	High input voltage range : 4.5 - 30 VDC=	30 - 240 VAC~
	Short-circuit impedance : $\leq 10$ k $\Omega$	Low input voltage range : 0 - 2 VDC=	
	Open-circuit impedance : $\geq 500$ k $\Omega$	Voltage: 3 - 30 VAC~	
<b>HOLD</b>	YES		
<b>Unit weight (packaged)</b>	$\approx 59$ g ( $\approx 91.5$ g)		
<b>Certification</b>	CE ENEC		
<b>Power supply</b>	Built-in battery (CR2477)		
<b>Battery life cycle</b>	$\geq 3$ years (at $\approx 20$ °C)		
<b>Insulation resistance</b>	$\geq 100$ M $\Omega$ (500 VDC= megger)		
<b>Dielectric strength</b>	Between the charging part and the case : 3,000 VAC~ 50 / 60 Hz for 1 min (Cutoff current = 10 mA)		
<b>Vibration</b>	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour		
<b>Vibration (malfunc.)</b>	0.3 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minute		
<b>Shock</b>	300 m/s <sup>2</sup> ( $\approx 30$ G) in each X, Y, Z direction for 3 times		
<b>Shock (malfunc.)</b>	100 m/s <sup>2</sup> ( $\approx 10$ G) in each X, Y, Z direction for 3 times		
<b>Ambient temp.</b>	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
<b>Ambient humid.</b>	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
<b>Protection rating</b>	IP66 (when using waterproof rubber for front panel), terminal cover (finger protector)		
<b>Display unit</b>	<b>Display range</b>	<b>Display accuracy</b>	
<b>RPM</b>	1 to 10000 RPM	1 to 5000 RPM: F.S. $\pm 0.05$ % $\pm 1$ -digit	
<b>0.1RPM</b>	0.1 to 1000.0 RPM	5001 to 10000 RPM: F.S. $\pm 0.1$ % $\pm 1$ -digit	
<b>Hz</b>	1 to 1000 Hz	F.S. $\pm 0.1$ % $\pm 1$ -digit	
<b>0.1Hz</b>	0.1 to 100.0 Hz		
<b>RPS</b>	1 to 1000 RPS		

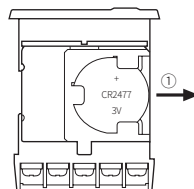
## Detach the Case



- Hold up Lock part to direction ①, ② that top and bottom of the product with the tools, and pull the terminal to direction ③ to detach the case.

⚠ **Caution: When using the tools, be careful not to be wounded.**

## Replace the Battery



- Detach the case and pull the battery (CR2477) toward direction ① to detach from the product.
- Insert a new battery with the correct alignment of polarity.

### ■ Cautions when using the lithium battery

- Use the battery for the specifications.
- Do not charge, short, disassemble, subject it to shock, heat.
- Check the polarity.
- Do not solder on a battery directly.
- Insulate a battery with tape to dispose.
- Do not store this unit in the place with the direct sunlight, high temperature and humidity.

## DIP Switch Setting

01. Select one among  $\times 1$ ,  $\times 0.1$ , RPS by SW2.

02. MUST shift SW 1 to RESET.

03. Select one again between RPM / RPS and Hz by SW1.

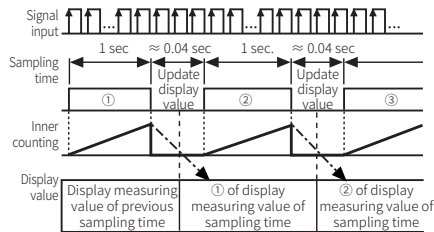


- When display range and unit in front display panel do not conform, move SW 1 to RESET and select RPM / RPS or Hz again.

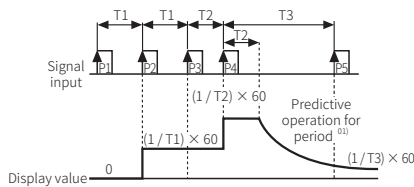
RPM	0.1 RPM	Hz	0.1 Hz	RPS
1 2	1 2	1 2	1 2	1 2

## Operation Chart

### Display range: RPS, Hz



### Display range: 0.1 RPM, 0.1 Hz, RPM



01) It implements predictive operation for period without auto zero time setting function (if there is no pulse input within setting time, it displays the value as zero forcibly). If there is any input signal within certain time ( $T_2$ ), CPU considers input to be supplied, display value is decreased continuously.

## Operation Mode

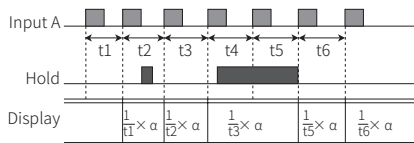
### Frequency / revolutions

Measures the frequency of input A and displays the calculated frequency, and revolutions.

Display value	Display unit	$\alpha$
Frequency	Hz	1
	0.1Hz	10
	RPM	60
Revolutions	0.1RPM	600
	RPS (default)	1

$$\text{Frequency (Hz)} = f \times \alpha \quad (\alpha = 1 [\text{sec}])$$

$$\text{Revolutions (rpm)} = f \times \alpha \quad (\alpha = 60 [\text{sec}])$$



## Input Connections

### No-voltage input

#### Solid-state input

