

# LP series

## INSTRUCTION MANUAL

Thank you for purchasing Hanyoung Nux products. Please read the instruction manual carefully before using this product, and use the product correctly.

Also, please keep this instruction manual where you can view it at any time.

### Safety information

Please read the safety information carefully before use, and use the product correctly.

The alerts declared in the manual are classified into **Danger**, **Warning** and **Caution** according to their importance.

**DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury

**WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or property damage

**NOTE** Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION

A mark regarding the separation, discharge, recovery and recycling of waste electrical and electronic products.

Check the electrical safety manual.

### DANGER

The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

### WARNING

Any use of the product other than those specified by the manufacturer may result in personal injury or property damage.

If there is any short circuit or overvoltage in the system, it may lead to a serious accident to the system. Install an appropriate protection circuit on the outside.

Do not use the product with a power switch and fuse, install them separately on the outside.

Fuse rating: 250 V a.c. 5mA Low breaking capacity, Time lag.

Please supply the correct power voltage, in order to prevent product breakage or malfunctions.

### CAUTION

The contents of this manual may change without prior notice or permission.

Please make sure the product matches the specifications you ordered.

Please check for any damage or problems with the product during transportation.

Please use the product in places where corrosive gases, such as harmful gases, ammonia, etc., and flammable gases are not generated.

Use the product in locations free from dust, vibrations and impacts that are applied directly to the product of the meter.

When installing the product, please use switches or circuit breakers compliant with IEC 60947-4-2.

Do not use cutters.

Please do not wipe the product with organic solvents such as alcohol, benzene, etc. (which may deteriorate the surface of the product).

Do not use solvents where large dielectric interference, static electricity, magnetic noise are generated.

Please avoid places with heat accumulation caused by direct sunlight, fire, water, etc.

Please use the product in places with elevation below 2000 m.

When enter areas, short circuit or fire may occur, so please inspect the product carefully.

-Overvoltage category II (OVC) II

When there is a lot of noise from the power, we recommend using insulation transformer and noise filter. Please install the noise filter to a grounded panel or structure etc., and make the wiring of noise filter output and power supply output as far as possible.

Please use the noise filter in the power source side of the product.

-Do not wire anything to the terminal.

After checking the connection of the terminal, turn on the power.

When installing the product, please use switches or circuit breakers compliant with IEC 60947-4-2.

Do not use cutters.

We recommend regular maintenance of the continuous usage of the product.

The warranty period for this product is 1 year, including its accessories and normal conditions of use.

The preparation of the contact output is required during power supply. If used as a signal output, refer to the relevant section.

The preparation of the contact output is required during power supply. This is a pulse meter mounted on industrial equipment. This product is used to control equipment and measure rotation speed, frequency, speed, etc.

-Overvoltage category II (OVC) II

When using the product in places with elevation below 2000 m.

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-Overvoltage category II (OVC) II

When water enters, short circuit or fire may occur, so please inspect the product carefully.

-Overvoltage category II (OVC) II

When entering an area with high humidity, short circuit or fire may occur, so please inspect the product carefully.

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## Basic function setting modes

Setting item	LCD display	Settings	Initial value
<i>F-nid</i> <i>F1</i>	Operation mode	• Selects operation mode (13 types) F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13	F1
<i>In-R</i> <i>nPN-L</i>	Input A sensor type	• Selects the sensor type of input A • Consists of NPN-L, NPNH-PNP-L, PNP-H (select and use NPN-L or PNP-L for contact input) NPN-L NPNH-PNP-L PNP-H	NPN-L
<i>In-b</i> <i>nPN-L</i>	Input B sensor type	• Selects the sensor type of input B - used only in F2, F5, F7, F8, F9, F10, F11, F12, F13 modes • Consists of NPN-L, NPNH-PNP-L, PNP-H (select and use NPN-L or PNP-L for contact input) NPN-L NPNH-PNP-L PNP-H	NPN-L
<i>o-nid</i> <i>out-D</i>	Output mode	• Output mode selection - used in all operation modes except F9 mode (only used in comparative output models) • Consists of standard output mode (S), HIGH output mode (H), LOW output mode (L), ONE-SHOT output mode (1), deviation output mode (D) • F9 mode is fixed to HIGH output mode (H) • <i>abt-S</i> → <i>out-L</i> → <i>out-H</i> → <i>out-L</i> → <i>out-D</i> → <i>out-T</i> OUT-S OUT-H OUT-L OUT-B OUT-F OUT-D	OUT-S
<i>P-RU</i> <i>60000</i>	Input A prescale mantissa	• Sets input A prescale mantissa (AX) - used only in F1, F2, F4, F7, F8, F9, F10, F11, F12, F13 modes • Setting range : 0.0000 ~ 9.9999 0.0000 ~ 9.9999 0.0000 ~ 9.9999	6.0000
<i>P-RY</i> <i>0</i>	Input A prescale index	• Sets input A prescale index (AY) - used only in F1, F2, F4, F7, F8, F9, F10, F11, F12, F13 modes • Setting range : 10 <sup>-9</sup> ~ 10 <sup>9</sup> 10 <sup>-9</sup> ~ 10 <sup>9</sup>	10 <sup>1</sup>
<i>P-bu</i> <i>60000</i>	Input B prescale mantissa	• Sets input B prescale mantissa (BX) - used only in F10, F11, F12, F13 modes • Setting range : 0.0000 ~ 9.9999 0.0000 ~ 9.9999 0.0000 ~ 9.9999	6.0000
<i>P-by</i> <i>0</i>	Input B prescale index	• Sets input B prescale index (BY) - used only in F10, F11, F12, F13 modes • Setting range : 10 <sup>-9</sup> ~ 10 <sup>9</sup> 10 <sup>-9</sup> ~ 10 <sup>9</sup>	10 <sup>1</sup>
<i>dec</i> <i>00000</i>	Decimal point position	• Selects decimal point of display value - used only in F1, F2, F7, F8, F9, F10, F11, F12, F13 modes • Comparative value setting range differs according to the decimal point setting position • <i>dec</i> → <i>dec</i> → <i>dec</i> → <i>dec</i> → <i>dec</i> 00000 0.0000 0.0000 0.0000 0.0000	00000
<i>SCRb</i> <i>0</i>	Numerical system	• Selects the numerical system of measured time - used only in F3, F4, F5, F6 modes • Consists of decimal and sexagesimal • <i>dec</i> → <i>dec</i> → 10 60	10
<i>rRn0</i> <i>001</i>	Time range	• Selects measured time range - used only in F3, F4, F5, F6 modes • Decimal time range : 0.01 (0~999.99), 0.1 (0~9999.99), SEC (0~99999.999), MIN (0~999999.99) • Sexagesimal time range : 0.01 (0~9m59.99), 0.1 (0~9m59.99), SEC (0~9m59.999), MIN (0~9m59.999) • <i>dec</i> → <i>dec</i> → <i>dec</i> → SEC → MIN 0.01 0.1 SEC MIN	0.01
<i>d-REF</i> <i>005</i>	Display cycle	• Selects display cycle - only in F1, F10, F11, F12, F13 • Consists of 0.05, 0.1, 2, 4, and 8 sec - The measured value is updated according to display cycle • <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> 0.05 0.05 1 2 4 8	0.05

## RS485 signal output function setting mode (Displayed only for signal output models)

Setting item	LCD display	Settings	Initial value
<i>S-nq</i> <i>001</i>	Signal number	• Select a signal number 001 ~ 127	001
<i>bP5</i> <i>96</i>	Signal speed	• Select a signal speed 38400 19200 9600 4800 2400 bps	96
<i>PLy</i> <i>none</i>	Parity bit	• Select the signal parity bit NONE → odd → even NONE ODD EVEN	NONE
<i>rLd</i> <i>20</i>	Response latency	• Sets the signal response latency 05 ~ 99 05 99	20
<i>CWP</i> <i>on</i>	Communication write prohibition	• Select Communication write prohibition. ON → OFF ON OFF	ON

## PV input/output function setting mode (Displayed only for input/output models)

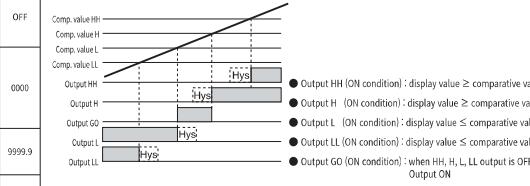
Setting item	LCD display	Settings	Initial value
<i>PuSH</i> <i>59999</i>	Transfer Output Upper limit	• Set the upper limit for the transmission output of 20 mA. • The measured value should be set larger than the lower limit value. • The setting range of the upper limit value depends on the operation mode • Conserves comparison value setting range. • If the measured value is above the upper limit, 20mA is output. -99999 ~ +99999 -99999 ~ +99999	99999
<i>PuSL</i> <i>00000</i>	Transfer Output Lower bound	• Set the lower limit for the transmission output of 4mA. • The lower limit value should be set less than the upper limit value. • The setting range of the lower limit value depends on the operation mode (see Comparison Value Setting Range). • If the measured value is below the lower limit, 4mA is output. -99999 ~ +99999 -99999 ~ +99999	00000

## Extended function setting modes

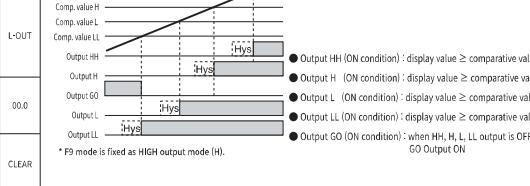
Setting item	LCD display	Settings	Initial value
<i>F-In</i> <i>off</i>	Initial mode	• Initializes all parameter set values. • Consists of OFF and ON - when ON is selected, all parameter set values are initialized OFF → ON OFF ON	OFF
<i>HYS</i> <i>0000</i>	Hysteresis	• Sets hysteresis value for output - only in F1, F10, F11, F12, F13 (only used with comparative output models) • Hysteresis range depends on decimal point setting position 0.000 (0.00~9.999), 0.0000 (0.0~99.99), 0.00000 (0.0~999.999), 0.000000 (0.0~9999.999), 0.0000000 (0.0~99999.9999) 0.000 ~ 99999 0.000 ~ 99999 0.000 ~ 99999	0000
<i>Rz-R</i> <i>99999</i>	Input A AUTO-ZERO	• Sets input A AUTO-ZERO time - used only in F1, F10, F11, F12, F13 modes • Setting range : 0.0 ~ 9999.9 sec 0.0000 ~ 9999.9 0.0000 ~ 9999.9	9999.9
<i>Rz-b</i> <i>99999</i>	Input B AUTO-ZERO	• Sets input B AUTO-ZERO time - used only in F10, F11, F12, F13 modes • Setting range : 0.0 ~ 9999.9 sec 0.0000 ~ 9999.9 0.0000 ~ 9999.9	9999.9
<i>o-L</i> <i>LL</i>	Output limit	• Selects comparative output limit - used in all operation modes except F9 (only used in comparative output models) • Consists of L, LL output limit and start compensation timer • When L-OUT is selected, L output and LL output are limited. When S-1M is selected, the comparative output is limited by start compensation timer L-OUT → S-1M → L-OUT L-OUT → S-1M → L-OUT	L-OUT
<i>S-tmr</i> <i>000</i>	Start compensation timer	• Sets comparative output limit time of start compensation timer - You can set output limit function when S-TMR is set • Setting range : 0.0 ~ 99.9 sec 0.000 ~ 99.9 0.000 ~ 99.9	0.00
<i>bACR</i> <i>CLEAR</i>	Power outage memory	• Saves final count value when power is off - only in F9 • Consists of CLEAR and SAVE • When SAVE is selected, the final count value is saved CLEAR → SAVE CLEAR → SAVE	CLEAR
<i>b-CNG</i> <i>OFF</i>	BANK switching	• Selects the activation of BANK function • When the BANK function is activated, the comparative value, prescale, decimal point position, time range, display cycle are measured with the value set in BANK • OFF selection : deactivates BANK function. • KEY selection : switches BANK number by <i>b</i> (hold for at least 1sec. ON state) • EX-KEY selection : switches BANK number by external BANK input b-CNG → EX-b → EX-KEY → b → b-KEY	OFF
<i>LoC</i> <i>OFF</i>	Lock	• Selects the activation of lock function • OFF selection : unlock keys and parameters. • KEY selection : locks <i>b</i> , <i>KEY</i> , <i>PAR</i> in operation mode (only comparative value checking is possible, not comparative value setting) • PAR selection : locks parameters. • K+P selection : locks key and parameter lock simultaneously (comparative value setting and parameter change are not possible). • b-KEY selection : locks BANK (BANK setting is not possible) b-KEY → KEY → PAR → b-KEY → b-KEY → b-KEY	OFF
		• The comparative value size order of B output mode must be set in the "Hb-H-L-L" order.	
Setting item	LCD display	Settings	Initial value
<i>Bank</i> <i>1</i>	BANK number	• Selects BANK number • Consists of BANK_1 and BANK_2 - individually sets comparative value, prescale, decimal point position, time range, display cycle for each BANK. 1 → 2	1
<i>P-RU</i> <i>60000</i>	Input A prescale mantissa	• Sets BANK_1,2 input A prescale mantissa (AX) - used only in F1, F2, F4, F7, F8, F9, F10, F11, F12, F13 modes • Setting range : 0.0000 ~ 9.9999 0.0000 ~ 9.9999 0.0000 ~ 9.9999	6.0000
<i>P-RY</i> <i>0</i>	Input A prescale index	• Sets BANK_1,2 input A prescale index (AY) - used only in F1, F2, F4, F7, F8, F9, F10, F11, F12, F13 modes • Setting range : 10 <sup>-9</sup> ~ 10 <sup>9</sup> 10 <sup>-9</sup> ~ 10 <sup>9</sup>	10 <sup>1</sup>
<i>P-bu</i> <i>60000</i>	Input B prescale mantissa	• Sets BANK_1,2 input B prescale mantissa (BX) - used only in F10, F11, F12, F13 modes • Setting range : 0.0000 ~ 9.9999 0.0000 ~ 9.9999 0.0000 ~ 9.9999	6.0000
<i>P-by</i> <i>0</i>	Input B prescale index	• Sets BANK_1,2 input B prescale index (BY) - used only in F10, F11, F12, F13 modes • Setting range : 10 <sup>-9</sup> ~ 10 <sup>9</sup> 10 <sup>-9</sup> ~ 10 <sup>9</sup>	10 <sup>1</sup>
<i>dec</i> <i>00000</i>	Decimal point position	• Selects display value decimal point position of BANK_1,2 - used only in F1, F2, F7, F8, F9, F10, F11, F12, F13 modes • The comparative value setting range depends on the decimal point setting position 0.0000 ~ 0.0000 0.0000 ~ 0.0000 0.0000 ~ 0.0000	00000
<i>SCRb</i> <i>0</i>	Numerical system	• Selects the numerical system of measured time - used only in F3, F4, F5, F6 modes • Consists of decimal and sexagesimal • <i>dec</i> → <i>dec</i> → 10 60	10
<i>rRn0</i> <i>001</i>	Time range	• Selects measured time range - used only in F3, F4, F5, F6 modes • Decimal time range : 0.01 (0~999.99), 0.1 (0~9999.99), SEC (0~99999.999), MIN (0~999999.99) • Sexagesimal time range : 0.01 (0~9m59.99), 0.1 (0~9m59.99), SEC (0~9m59.999), MIN (0~9m59.999) • <i>dec</i> → <i>dec</i> → SEC → MIN 0.01 0.1 SEC MIN	0.01
<i>d-REF</i> <i>005</i>	Display cycle	• Selects display cycle - only in F1, F10, F11, F12, F13 • Consists of 0.05, 0.1, 2, 4, and 8 sec - The measured value is updated according to display cycle • <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> → <i>d-REF</i> 0.05 0.05 1 2 4 8	0.05
Setting item	LCD display	Settings	Initial value
<i>S-nq</i> <i>001</i>	Signal number	• Select a signal number 001 ~ 127	001
<i>bP5</i> <i>96</i>	Signal speed	• Select a signal speed 38400 19200 9600 4800 2400 bps	96
<i>PLy</i> <i>none</i>	Parity bit	• Select the signal parity bit NONE → odd → even NONE ODD EVEN	NONE
<i>rLd</i> <i>20</i>	Response latency	• Sets the signal response latency 05 ~ 99 05 99	20
<i>CWP</i> <i>on</i>	Communication write prohibition	• Select Communication write prohibition. ON → OFF ON OFF	ON

## Output modes

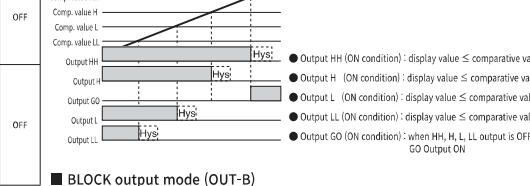
### Standard output mode (OUT-S)



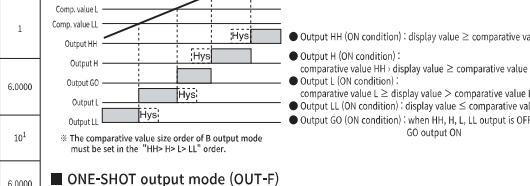
### HIGH output mode (OUT-H)



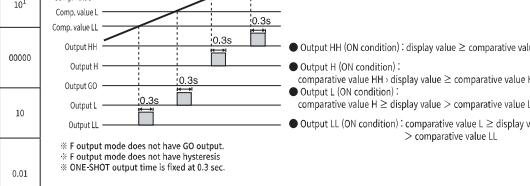
### LOW output mode (OUT-L)



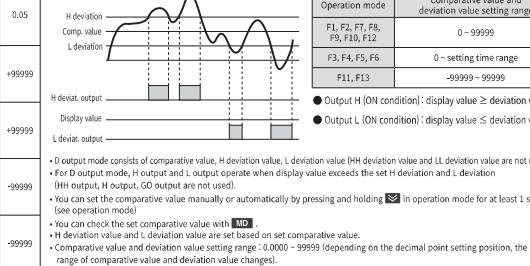
### BLOCK output mode (OUT-B)



### ONE-SHOT output mode (OUT-F)



### Deviation output mode (OUT-D)



## Function description

### AUTO-ZERO function

Function that forces display to "0" when there is no input pulse during AUTO-ZERO setting time  
• Please set the AUTO-ZERO setting time to longer than the longest input pulse.  
• If the input pulse duration is too long, even without input pulse, the time to change the display value to "0" will be delayed, so please set the AUTO-ZERO time to match the input pulse.  
• AUTO-ZERO setting time can be set individually for Input A and Input B.  
• AUTO-ZERO time setting range : 0.0 ~ 9999.99s

### Start compensation timer function

Function to limit HH, H, L, LL, GO outputs during the set time until the measuring instrument stabilizes after power on.  
• Start compensation timer setting range : 0.0 ~ 99.9s  
• When measuring the output, the compensation timer starts when the measured value reaches the H and L comparative values, and when the measured value increases from H and L comparative values, the compensation timer stops.

### Comparative output limit function

Function that limits output and LL output until H output and HH output operate after power on.  
• Used only in standard output mode, BLOCK output mode, and deviation output mode.

### Hysteresis function

If the measured value is smaller than the comparative value, the output will be unstable. Function that sets hysteresis value based on comparative value to prevent such occurrences.  
• The measured value is applied when the measured value decreases from HH and L comparative values, and when the measured value increases from H and L comparative values.

Decimal point position Hysteresis value setting range

00000	0 ~ 9999
00000.0	0.0 ~ 99.99
00000.00	0.00 ~ 9.999
00000.000	0.000 ~ 999.999
00000.0000	0.0000 ~ 9999.9999

### Display cycle function

A function that measures the detector during the set time of the display cycle and displays the measured value by averaging it during the set time.

The display value is changed by the setting time of the display cycle.

• When measuring high-speed pulse, display value can be stabilized by adjusting display cycle.

• For output models, if the display cycle is long, the output operation may be delayed.

### Time unit selection function

• Function that displays measured value in several time units.  
• Time units can be expressed in decimal and sexagesimal notations.  
• Time units are available only in F3, F4, F5, F6 modes.

### Maximum and minimum value display function

• Function that selects and displays the max. measured value and min. measured value of input pulse  
• When displaying the maximum value, the display shows "MAX".  
• When displaying the minimum value, the display shows "MIN".

• To check the measured value and min. measured value, if you press MAX you can view them sequentially (see operation mode).

• In the maximum value display mode, if you press and hold MAX for at least 1 second, the maximum value will be initialized to the current measured value (see operation mode).

• In the minimum value display mode, if you press and hold MIN for at least 1 second, the minimum value will be initialized to the current measured value (see operation mode).

### HOLD and RESET functions

• Function that makes the current display value to remain unchanged when the ON signal is input to the external HOLD terminal.

• The display value is maintained only while the HOLD signal is ON.

• In F9 mode, the external HOLD terminal is used as RESET signal.

• When RESET signal is applied in F9 mode, count value is initialized to "0".

### Lock function

• Function that can set parameter, BANK, KEY operation lock

Lock setting Descriptions

<i>OFF</i>	Unlocks parameters and keys
<i>KEY</i>	Locks <i>b</i> , <i>KEY</i> , <i>PAR</i> . Cannot set comparative values, cannot change parameters
<i>PAR</i>	Locks parameters. Can set comparative values, cannot change parameters
<i>H-P</i>	Locks parameters and keys. Cannot set comparative values, cannot change parameters
<i>bNE</i>	Locks BANK. Can set comparative values and change parameters. Can switch BANK_1, 2, cannot set BANK parameters

### Bank function

• Function that enables the comparative value and the prescale value to be saved in advance in two BANKs, and to be easily switched and used on demand.

• The BANK function is used when the prescale value needs to be changed, such as changing the transmission ratio.

• Consists of two banks, such as BANK\_1 and BANK\_2.

• You can set prescale, decimal point position, display refresh cycle, comparative value, etc., to the BANK.

• When the BANK function is activated, it uses and measures the comparative value and prescale value that are saved in the relevant BANK.

• If the BANK function is deactivated, the display shows "BA" and BANK number.

• When the BANK function is activated, it uses and measures the comparative value and prescale value that are saved in the relevant BANK.

• If the parameter "b-CNG" is set to "EX-INT", the BANK switching is performed by *b* (the BANK is switched every time you press and hold *b*) for at least 1 second).

• If the BANK parameter "b-CNG" is set to "EX-INT", the BANK switching is performed by external BANK terminal input (BANK\_1 is used when the BANK terminal is opened, and BANK\_2 is used when the BANK terminal is short.)

\* For further information, please visit our homepage ([www.hanyoungnuix.com](http://www.hanyoungnuix.com)) and refer to the user's manual.