

Multi Pulse Meter

BP6**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 Sensor/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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HANYOUNG NUX**■ Safety information**

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contain important contents related with safety; therefore, please follow the instructions accordingly. The precautions are composed of DANGER, WARNING and CAUTION.

⚠ DANGER

There is a danger of occurring electric shock in the input/output terminals so please never let your body or conductive substance is touched.

⚠ WARNING

1. 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: 250V 0.5A)
2. To prevent deflection or malfunction of this product, apply a proper power voltage in accordance with the rating.
3. To prevent electric shock or malfunction of product, do not supply the power until the wiring is completed.
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.
6. If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
7. There is a possibility of occurring electric shock so please use this product after installing it onto a panel while it is operating.

⚠ CAUTION

1. The contents of this manual may be changed without prior notification.
2. Before using the product you purchased, make sure that it is exactly what you ordered.
3. Make sure that there is no damage or abnormality of the product during the delivery.
4. Do not use this product at any place with occurring corrosive (especially noxious gas or ammonia) or flammable gas.
5. Do not use this product at any place with direct vibration or impact.
6. Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Use at Pollution level 1 or 2)
7. Do not polish this product with substances such as alcohol or benzene. (Use neutral detergent.)
8. Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
9. Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
10. Install this product at place under 2,000m in altitude.
11. When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
12. If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended.
13. The noise filter must be attached to a panel which is already connected to a ground and the wire between the filter output side and power supply terminal must be short as possible.
14. If twisting the power cables closely together then it is effective against noise.
15. Do not connect anything to the unused terminals.
16. After checking the polarity of terminal, connect wires at the correct position.
17. When this product is connected onto a panel, use a circuit breaker or switch approved with IEC947-1 or IEC947-3.
18. Install a circuit breaker or switch at near place for convenient use.
19. Write down on a label that if the circuit breaker or switch is operating then the power will be disconnected since the circuit breaker or switch is installed.
20. For the continuous and safe use of this product, the periodical maintenance is recommended.
21. Some parts of this product have limited life span, and others are changed by their usage.
22. The warranty period for this product including parts is one year if this product is properly used.

■ Suffix Code Structure

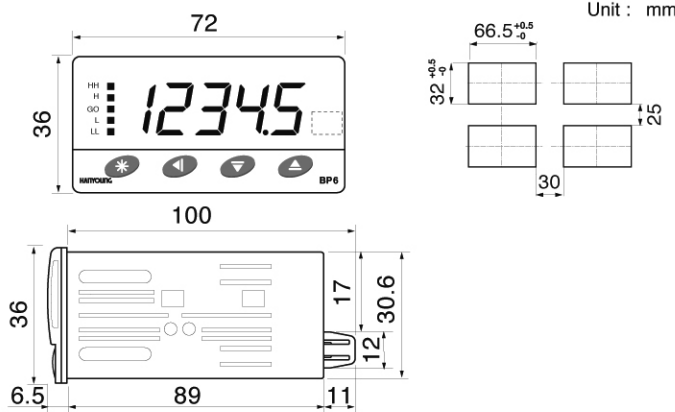
Model Name	Suffix code	Description
BP	☐ ☐ ☐ ☐	Multi Pulse Meter
Size	6	DIN Size: (W)72 mm x H36mm
Displayable Digits	5	5 digits 1 stage
Power Supply	A	100 - 240V AC (50/60Hz)
Specification	D	12 - 24V AC
Output Specification Size-6	N	Only display
	1	Relay 3 stages Output
	2	Relay 3 stages Output
	3	Relay 3 stages Output
	4	NPN Open Collector 5 Stages Output
	5	NPN Open Collector 5 Stages Output
	6	-
	7	Relay 3 stages Output

■ Ratings

Power Supply		100 - 240 V AC 50/60 Hz
Power Consumption		Approx. 3.5 VA (240 V AC)
Voltage for Sensor		12 V DC $\pm$ 10 % 80 mA
Measurement Accuracy		· Mode F1, F4, F10, F11, F12, F13: FS $\pm$ 0.05rdg $\pm$ 1 dig · Mode F2, F3, F5, F6: FS $\pm$ 0.01 %rdg $\pm$ 1 dig
Measurement Range		· Mode F1, F10, F11, F12, F13: 0.0005 Hz $\sim$ 50 Hz · Mode F3, F4: 0.02 s $\sim$ 3.200 s · Mode F2, F5, F6: 0.01 s $\sim$ 3.200 s · Mode F7, F8, F9: 0 $\sim$ 4 x 10 ⁶ Count
Input Signal		Non-Contact Input: Max. 50 Hz (ON/OFF width for each above 10 μ s) (ON voltage: 4.5 V $\sim$ 24 V, OFF voltage: 0 $\sim$ 1.0 V) Contact Input: Max. 50 KHz (ON/OFF width for each above 8.3 ms) (12 V DC, able to switch the current of 2 mA sufficiently)
Max. Displayable Digits		5 digits (-19999 $\sim$ 99999)
Display Method		7 Segment
Display Cycle		0.05/0.5/1/2/8sec (each setting for each bank/batch setting selection function)
Hysteresis		0 $\sim$ 9999 (each setting for each bank/batch setting selection function, applicable only for output type)
Functions		· Auto Zero Time Setting Function · Display Cycle Setting Function · Time Unit Selection Function (each setting for each bank/batch setting selection function) · Parameter Lock Function · 4 Steps Bank Setting Function · Remote/Local Conversion Function (applicable only for communication output type) · Current Output Range Selection Function (applicable only for current output type) · Max. Min. Peak Value 10 Steps Memory Function (Max.: 4 steps save, Average Value Save Min.: 4 steps save, Average Value Save) · Start Compensation Timer Function · Electricity Failure Compensation (applicable only for F9) · Comparative Output Function (HH, H, GO, L, LL)
Output	Output Types	· Transistor Output (NPN Open Collector Output): Comparative, Alarm Output · Relay Output (HH, H, GO, L, LL) · PV Transfer Output (4 - 20 mA DC): Displayed Value Output · RS485 Communication Output (32 channels): Displayed Value Output, PC Setting Function (See the Output Specification) · BCD Dynamic Displayed Value Output Function
	Relay (main)	277 V AC 3 A, 30 V DC 3 A MAX.
	Non-Contact(main)	NPN Open Collector 12 - 24 V d.c 30 mA MAX.
	BCD	NPN Open Collector 12 - 24 V d.c 30 mA MAX.
	Current	4 $\sim$ 20 mA DC Indicated Value(PV) Output, Resistive Load: below 600 Ω
Current Input		4 $\sim$ 20 mA DC Input
RS-485 Communication		32 channels, two-way communication is possible
Memory		Non-volatile Memory (10 years)
Insulation Resistance		Above 10 M Ω (at 500 V DC mega) Between electrically chargeable part and non-electrically chargeable part
Noise Immunity		By noise simulator, square-shaped wave noise (pulse width 1 μ s) $\pm$ 2000 V

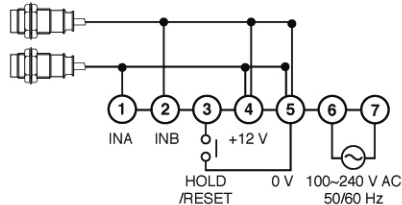
Life Expectancy	Mechanical	Above 100 thousand times (250 V AC 3 A, switching: 20 times/1 minute)
	Electrical	Above 5 million times (switching: 180 times/1 minute)
Dielectric Strength		2000 V AC 60 Hz for 1 minute (between AC power terminal and case, between AC terminal and measurement input terminal)
Vibration Resistance	Durability	10 ~ 55 Hz double amplitude width 0.75 mm in each X · Y · Z direction for 2 hours
	Malfunction	10 ~ 55 Hz double amplitude width 0.5 mm in each X · Y · Z direction for 10 minutes
Shock Resistance	Durability	300 m/s ² (approx. 30G) in each X · Y · Z direction for 3times
	Malfunction	100 m/s ² (approx. 10G) in each X · Y · Z direction for 3times
Operating Ambient Temperature		-10 ~ +50 °C (without condensation)
Storage Temperature		-20 ~ +60 °C (without condensation)
Operating Ambient Humidity		35 ~ 85 % RH
Weight		Approx. 135 g

Aspect & Panel Cutout Dimension

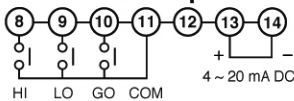


Wiring Diagram

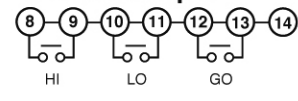
Input Terminal Block



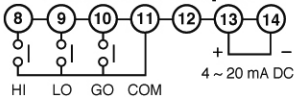
RELAY Contact Output + Current Input



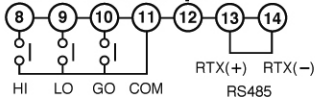
RELAY Contact Output + Current Input



RELAY Contact Output + Current Output

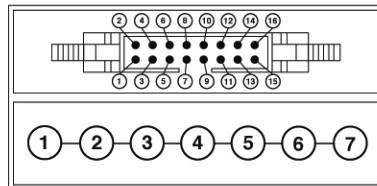


RELAY Contact Output + RS485 Output

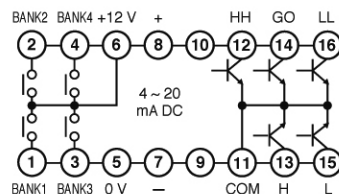


Auxiliary Connector Output

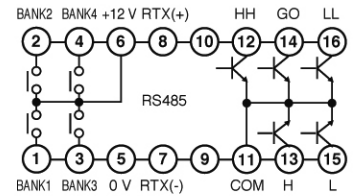
(Applicable for BP6-5A4, BP6-5A5 and BP6-5A6)



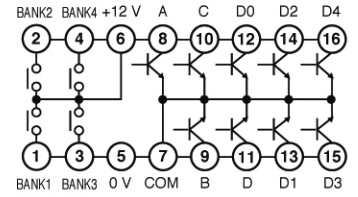
NPN Open Collector + Current Output



NPN Open Collector + RS485 Output



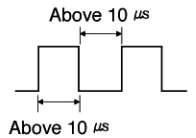
Bank Input + BCD Output (NPN Open Collector)



Input Specification

Input Specification

The max input frequency is 50 kHz when ON/OFF time is higher than the minimum 10 μ s. At this time, it can be accurately measured if the duty rate of the input pulse is 50 %.



Input Type Setting

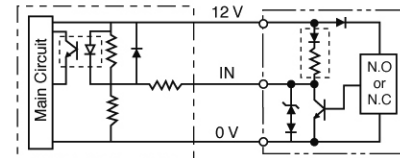
(note 1)

• $\overline{N}C\overline{N}O$ (NON-Contact Normal Open)

- Normal Open Sensor of Voltage Output, NPN Type (Open Collector, Voltage Output)

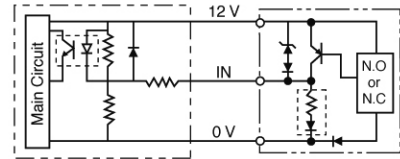
• $\overline{N}C\overline{N}C$ (NON-Contact Normal Close)

- Normal Close Sensor of Voltage Output, NPN Type (Open Collector, Voltage Output)



• $P\overline{N}P\overline{N}O$ (NON-Contact PNP Normal Open) - Normal Open Sensor of PNP Type

• $P\overline{N}P\overline{N}C$ (NON-Contact PNP Normal Close) - Normal Close Sensor of PNP Type

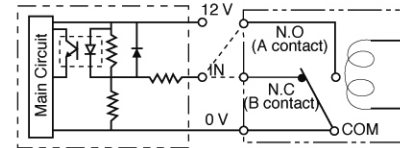


• $C\overline{N}C\overline{N}O$ (Contact Type Normal Open)

- electromagnetic switch, contact switch, relay, etc of Normal Open Type (applicable only for Mode F9)

• $C\overline{N}C\overline{N}C$ (Contact Type Normal Close)

- electromagnetic switch, contact switch, relay, etc of Normal Open Type (applicable only for Mode F9)



Caution when selecting Sensor Type

• Before connecting the sensor, if the input specification is not selected properly, the desired measure value can not be obtained.

From the F9 mode which can perceive INB if you are using the counter without connecting a sensor to IN B, NON-Contact Normal Open (note 2) should be selected in the input specification of IN B in order to use the counter.

note 1) Set in the IN A, IN B of Parameter Group ③ Setup Group

note 2) Set in the IN B of Parameter Group ③ Setup Group

Operating Mode

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

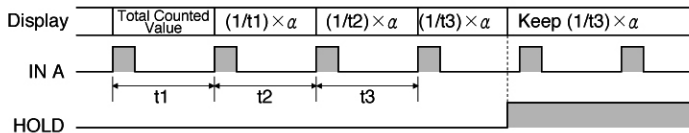
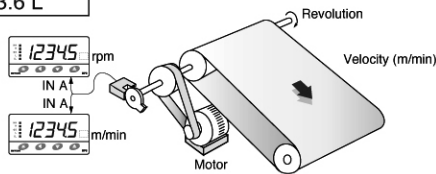
- Revolution (RPM): IN A Input Cycle(f) $\times \alpha$ ($\alpha=60 \times$ prescale value) display value (default)
- Frequency (Hz): IN A Input Cycle(f) $\times \alpha$ ($\alpha=$ prescale value) display value
- Velocity (m/min): IN A Input Cycle(f) $\times \alpha$ ($\alpha=60 \times L/N$) display value
 $L = \pi D$ (circumference of the revolving object)
 $\alpha =$ prescale value, $N =$ the number of waveform per 1 revolution

● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	mm/s	1000 L
	cm/s	100 L
	m/s	L (default)
	m/min	60 L
	km/hour	3.6 L

Display value	Units	Prescale Value(α)
Frequency	Hz	1
	KHz	0.001
Revolution	RPS	1
	RPM	60

● Example of Application



■ Mode F2 : Moving Velocity (m/s)

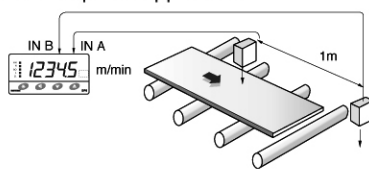
Display the moving velocity from ON of IN A to ON of IN B.

• Velocity(m/s): IN A Input Frequency(f) $\times \alpha$ value display. $\alpha = L$ (m)

● Display value & Units

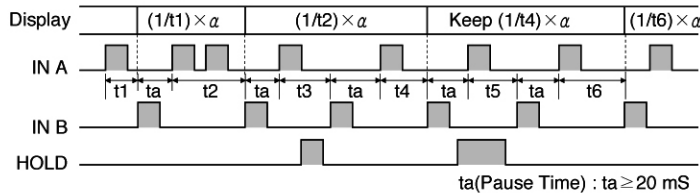
Display value	Units	Prescale Value(α)
Velocity	mm/s	1000 L
	cm/s	100 L
	m/s	1 L (default)
	m/min	60 L
	km/hour	3.6 L

● Example of Application



• Default of Prescale Value

: Time=1sec, Length=1m. L→the Distance from IN A sensor to IN B (unit:m)



■ Mode F3 : Cycle

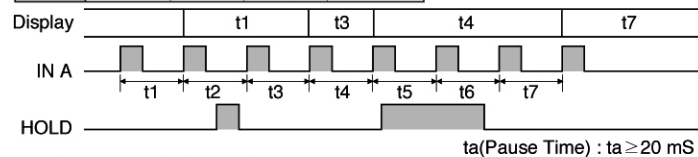
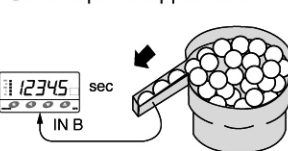
Display the input cycle (T) of IN A after measuring it

• Cycle: IN A Input Cycle (t)

● Display value & Units

Display value	Units	Prescale Value(α)
Cycle	9.9999s	55.5555
	99.999s	55.5555
	999.99s	55.5555
	9999.9s	55.5555
	99999s	55.5555

● Example of Application



■ Mode F4 : Passing Time

Display the passing time the after measuring the input cycle (T)

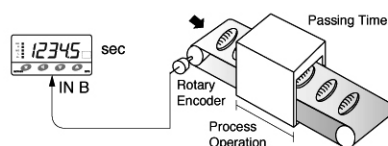
• Passing Time (sec): $t \times \alpha$

• Moving distance per 1 pulse = the circumference (πD) of the roller / N (Pulse per 1 revolution of the encoder)

• α (prescale) = process operation length (m) $\times$ moving distance (m) per 1 Pulse

※ Prescale is the required pulse number in order to pass the process operation.

● Example of Application



● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	9.9999s	55.5555
	99.999s	55.5555
	999.99s	55.5555
	9999.9s	55.5555
	99999s	55.5555

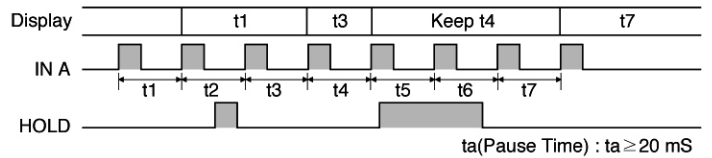
• Example of Obtaining a Prescale Value (no unit)

: The diameter of the revolving object = D

The number of pulse per 1 revolution of the encoder = N

Process Operation Length = L

: Prescale Value (α) = $L / (\pi D / N)$



■ Mode F5 : Time Lag

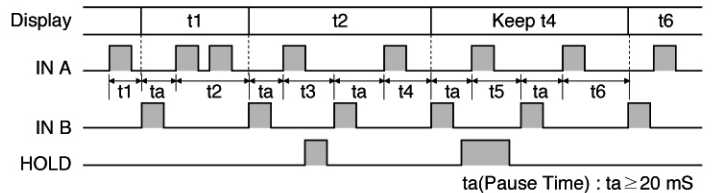
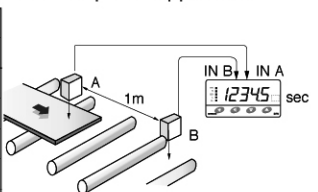
Display the time from ON of IN A to ON of IN B after measuring it

• Time Lag (T): t(IN A ~ IN B)

● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	10	60
	9.9999s	55.5555
	99.999s	55.5555
	999.99s	55.5555
	9999.9s	55.5555

● Example of Application



■ Mode F6 : Time Width

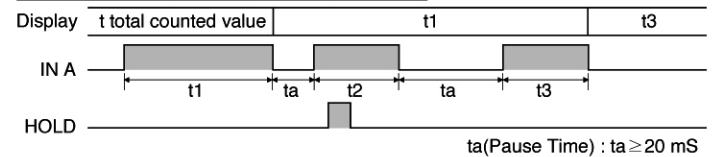
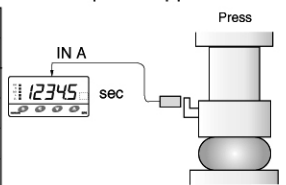
Display the time after measuring the time IN A is ON

• Time Width (T): t

● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	10	60
	9.9999s	55.5555
	99.999s	55.5555
	999.99s	55.5555
	9999.9s	55.5555

● Example of Application



■ Mode F7 : Pulse Width (length)

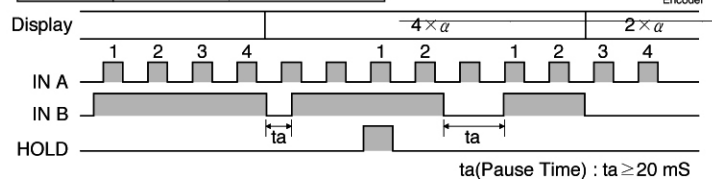
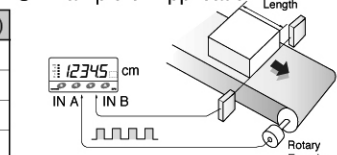
Display the length after measuring the pulse of IN A while IN B is ON

• Pulse Width = $P \times \alpha$ (P=Pulse of IN A, α = prescale value)

● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	mm	1000
	cm	100
	m	1
	Quantity(EA)	1

● Example of Application



■ Mode F8 : Pulse Interval Coefficient (Interval between objects)

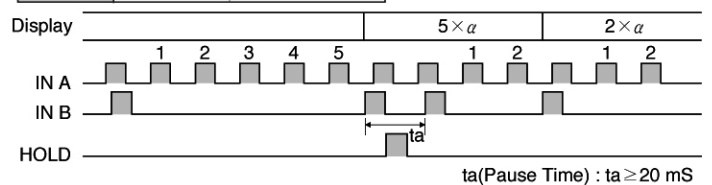
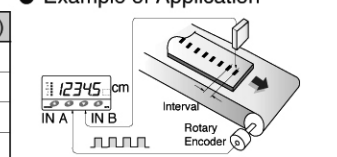
Display the pulse of input IN A from the time when IN B is ON to the time when IN is re-ON

• Interval = $P \times \alpha$ (P=Pulse of IN A, α = prescale value)

● Display value & Units

Display value	Units	Prescale Value(α)
Velocity	mm	1000
	cm	100
	m	1
	Quantity(EA)	1

● Example of Application



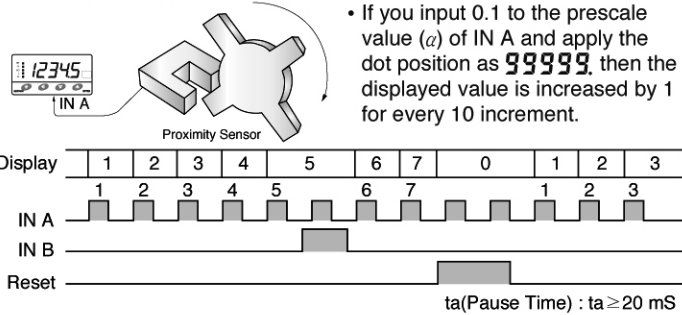
■ Mode **F9** : Addition Counter (Coefficient)

It starts counting the pulse which inputs to IN A but it does not count the pulse when IN B is ON.

If the RESET input is ON, then the counted value becomes "0."

- Counter = $P \times \alpha$ (P=Pulse of IN A, α =Prescale Value)

● Example of Application



■ Mode **F10** : Absolute Ratio (%)

Display the frequency absolute ratio of the IN B about the IN A

$$\text{Absolute Ratio(D)} : \frac{\text{Frequency of IN B (fB)} \times \beta}{\text{Frequency of IN A (fA)} \times \alpha} \times 100 (\%)$$

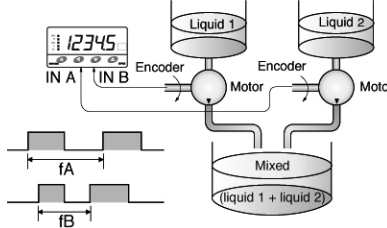
- α : prescale value of IN A
- β : prescale value of IN B
- When the frequency of IN A is 100 times higher than the that of IN B, the value's fluctuation can be existed but the value displayed only '1' or '0' since the it is out of the display range. At this time, one of the ways knowing the value is less than the decimal point is that giving a number higher than 10 to the prescale value of IN B or giving a number less than 0.1 to the prescale value of IN A.

● Display value & Units

Display value	Unit
Absolute Ratio	%

※ If the HOLD signal is ON then it will keep the present displayed value until the time when the HOLD signal is OFF.

● Example of Application



■ Mode **F11** : Error Ratio (%)

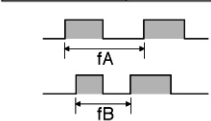
Display the error between the frequency of IN A and the frequency of IN B as ratio (%)

$$\text{Error Ratio(D)} : \frac{(\text{Frequency of IN B (fB)} \times \beta) - (\text{Frequency of IN A (fA)} \times \alpha)}{(\text{Frequency of IN A (fA)} \times \alpha)} \times 100 (\%)$$

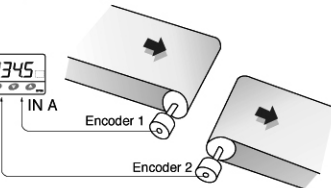
- α : prescale value of IN A
- β : prescale value of IN B

● Display value & Units

Display value	Unit
Error Ratio	%



● Example of Application



■ Mode **F12** : Concentration (%)

Display the concentration of IN B as the ratio (%) about the total frequency of and the IN A and the IN B

$$\text{Concentration Ratio(D)} : \frac{(\text{Frequency of IN B (fB)} \times \beta)}{(\text{Frequency of IN A (fA)} \times \alpha) + (\text{Frequency of IN B (fB)} \times \beta)} \times 100 (\%)$$

- α : prescale value of IN A
- β : prescale value of IN B

● Display value & Units

Display value	Unit	Prescale Value(α)
Absolute Ratio	%	$1/N_a, 1/N_b$ $\pi da/N_a, \pi db/N_b$

N_a : Pulse per 1 revolution of IN A
 N_b : Pulse per 1 revolution of IN B

πda : Moving Length (m) of 1 revolution of IN A

πdb : Moving Length (m) of 1 revolution of IN B

● Example of applying a prescale value :

If pulse per 1 revolution of IN A = N_a then α (prescale value) = $1/N_a$

If pulse per 1 revolution of IN B = N_b then β (prescale value) = $1/N_b$

$$\text{Absolute Ratio (D)} : \frac{fB / N_b}{(fA / N_a) + (fB / N_b)} \times 100 (\%)$$

※ If the HOLD signal is ON then it will keep the present displayed value until the time when the HOLD signal is OFF.

■ Mode **F13** : Error (the deviation of the different revolving objects)

Display the deviation of IN A and IN B

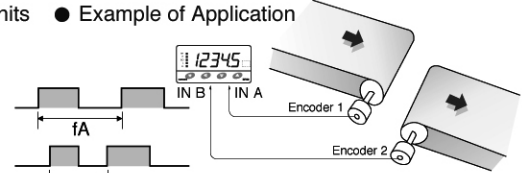
$$\text{Error Ratio(D)} : (\text{Frequency of IN B (fB)} \times \beta) - (\text{Frequency of IN A (fA)} \times \alpha)$$

- α : prescale value of IN A
- β : prescale value of IN B

● Display value & Units

Display value	Unit
Error	rpm Hz mm/s cm/s m/s m/min

● Example of Application



※ If the HOLD signal is ON then it will keep the present displayed value until the time when the HOLD signal is OFF.

■ Parameter Table For Each Series

Symbol Description : ○ (use), × (no use)

Displayed Characters	BP6-5AN	BP6-5A1	BP6-5A2	BP6-5A3	BP6-5A4	BP6-5A5	BP6-5A6	BP6-5A7
SP Group (Comparative Value Setting Group)								
SPGrP	×	○	○	○	○	○	×	○
SPbP.1	×	×	×	×	○	○	×	×
SP LHX	×	○	○	○	○	○	×	○
SP L L	×	○	○	○	○	○	×	○
SP L L L	×	×	×	×	○	○	×	×
PS Group (Prescale or Time Option Setting Group)								
dLdot	○	○	○	○	○	○	○	○
PSbP.1	○	○	○	○	○	○	○	○
PS LHX	○	○	○	○	○	○	○	○
PS L L	○	○	○	○	○	○	○	○
PS L L L	○	○	○	○	○	○	○	○
dSdot	○	○	○	○	○	○	○	○
dSSRP	○	○	○	○	○	○	○	○
HY5	×	○	○	○	○	○	○	○
tLNE	○	○	○	○	○	○	○	○
Setup Group (IN/OUT Setting Group)								
FUnCn	○	○	○	○	○	○	○	○
Ln-A	○	○	○	○	○	○	○	○
Ln-b	○	○	○	○	○	○	○	○
out-n	○	○	○	○	○	○	○	○
RUtA	○	○	○	○	○	○	○	○
RUtB	○	○	○	○	○	○	○	○
RUtA	○	○	○	○	○	○	○	○
RUtB	○	○	○	○	○	○	○	○
HY5	×	○	○	○	○	○	○	○
tLNE	○	○	○	○	○	○	○	○
dSSRP	○	○	○	○	○	○	○	○
Option Group (Option Setting Group)								
Pu-H	×	×	○	×	○	×	×	○
Pu-L	×	×	○	×	○	×	×	○
HY5o	×	○	○	○	○	○	○	○
tLNEo	○	○	○	○	○	○	○	○
dLdoto	○	○	○	○	○	○	○	○
dSSRP	○	○	○	○	○	○	○	○
Addr.n	×	×	×	○	×	○	×	×
bP5	×	×	×	○	×	○	×	×
rNotC	×	×	×	○	×	○	×	×
nEnos	○	○	○	○	○	○	○	○
ProCY	○	○	○	○	○	○	○	○
Peak Display Group (Peak Value Save Group)								
KPcP.1	○	○	○	○	○	○	○	○
KPcP.2	○	○	○	○	○	○	○	○
KPcP.3	○	○	○	○	○	○	○	○
KPcP.4	○	○	○	○	○	○	○	○
KPcP.A	○	○	○	○	○	○	○	○
LPcP.1	○	○	○	○	○	○	○	○
LPcP.2	○	○	○	○	○	○	○	○
LPcP.3	○	○	○	○	○	○	○	○
LPcP.4	○	○	○	○	○	○	○	○
LPcP.A	○	○	○	○	○	○	○	○

Parameter Table For Each Operation Mode

Symbol Description : ○ (use), × (no use)

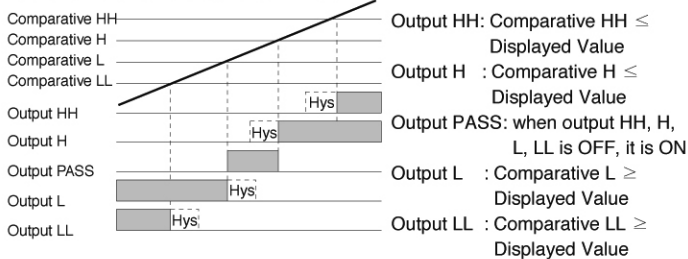
Displayed Characters	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
SP Group (Comparative Value Setting Group)													
SPGrP													
SPbY.1	○	○	○	○	○	○	○	○	○	○	○	○	○
SPHXH	○	○	○	○	○	○	○	○	○	○	○	○	○
SPLHX	○	○	○	○	○	○	○	○	○	○	○	○	○
SPLL	○	○	○	○	○	○	○	○	○	○	○	○	○
PSGrP													
PS Group (Prescale or Time Option Setting Group)													
dLdot	○	○	×	×	×	×	○	○	×	○	○	○	○
PSbY.1	○	○	○	○	○	○	○	○	○	○	○	○	○
PS1R0	○	○	×	○	×	×	○	○	○	○	○	○	○
PS1R4	○	○	×	○	×	×	○	○	○	○	○	○	○
PS1b0	×	×	×	×	×	×	×	×	×	○	○	○	○
PS1b4	×	×	×	×	×	×	×	×	×	○	○	○	○
dSdot	○	○	×	×	×	×	○	○	×	○	○	○	○
dSSRP	○	○	○	○	○	○	○	○	○	○	○	○	○
HYS	○	○	○	○	○	○	○	○	○	○	○	○	○
tLnE	×	×	○	○	○	○	×	×	×	×	×	×	×
SEtGrP													
Setup Group (IN/OUT Setting Group)													
FUnLn	○	○	○	○	○	○	○	○	○	○	○	○	○
Ln-A	○	○	○	○	○	○	○	○	○	○	○	○	○
Ln-b	×	○	×	×	○	×	○	○	○	○	○	○	○
out-n	○	○	○	○	○	○	○	○	○	○	○	○	○
RUtLn	○	○	○	○	○	○	○	○	○	○	○	○	○
RUtLn	×	○	×	×	○	×	○	○	○	○	○	○	○
RUtLn	○	○	○	○	○	○	○	○	×	○	○	○	○
RUtLn	×	×	×	×	×	×	×	×	×	○	○	○	○
HYS	○	○	○	○	○	○	○	○	○	○	○	○	○
tLnE	×	×	○	○	○	○	×	×	×	×	×	×	×
dSSRP	○	○	○	○	○	○	○	○	○	○	○	○	○
OpGrP													
Option Group (Option Setting Group)													
Pu-H	○	○	○	○	○	○	○	○	○	○	○	○	○
Pu-L	○	○	○	○	○	○	○	○	○	○	○	○	○
HYS0	○	○	○	○	○	○	○	○	○	○	○	○	○
tLnE0	×	×	○	○	○	○	×	×	×	×	×	×	×
dDot0	○	○	×	×	×	×	○	○	×	○	○	○	○
dSSRP	○	○	○	○	○	○	○	○	○	○	○	○	○
Addr.n	The communication setting is a system operation which is not related with the modes.												
bPS													
rDotLn	The remote control is a system operation which is not related with the modes.												
nE0r	×	×	×	×	×	×	×	×	×	×	×	×	×
PrnCY	○	○	○	○	○	○	○	○	○	○	○	○	○
PtYGrP													
Peak Display Group (Peak Value Save Group)													
HPtY.1	○	○	○	○	○	○	○	○	×	○	○	○	○
HPtY.2	○	○	○	○	○	○	○	○	×	○	○	○	○
HPtY.3	○	○	○	○	○	○	○	○	×	○	○	○	○
HPtY.4	○	○	○	○	○	○	○	○	×	○	○	○	○
HPtY.8	○	○	○	○	○	○	○	○	×	○	○	○	○
LPtY.1	○	○	○	○	○	○	○	○	×	○	○	○	○
LPtY.2	○	○	○	○	○	○	○	○	×	○	○	○	○
LPtY.3	○	○	○	○	○	○	○	○	×	○	○	○	○
LPtY.4	○	○	○	○	○	○	○	○	×	○	○	○	○
LPtY.8	○	○	○	○	○	○	○	○	×	○	○	○	○

Default Value of Parameter

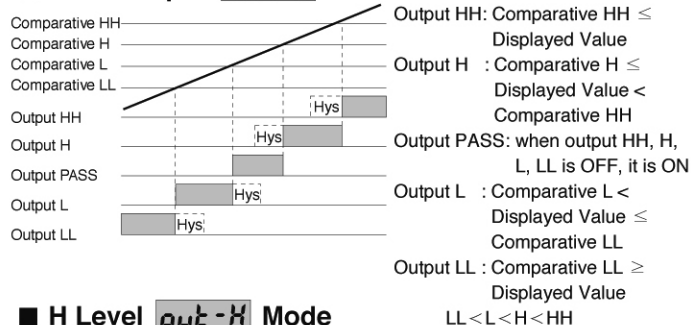
SP Group	Default	SETUP Group	Default	Option Group	Default
SPHXH	00000	FUnLn	F1	Pu-H	00000
SPLHX	00000	Ln-A	nLn0	Pu-L	00000
SPLL	00000	Ln-b	nLn0	HYS0	ALL
SPLL	00000	out-n	out-5	tLnE0	ALL
		RUtLn	000	dDot0	ALL
		RUtLn	000	dSSRP	ALL
		RUtLn	00000	Addr.n	00
		RUtLn	00000	bPS	2400
		HYS	0000	rDotLn	rE0r
		tLnE	tLnE0r0000	nE0r	on
		dSSRP	005	PrnCY	oFF

Output Mode out-n

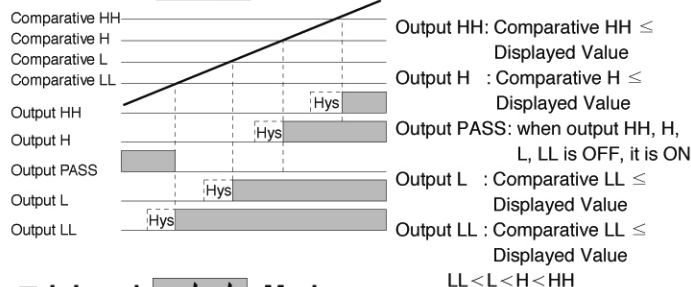
Standard out-5 Mode



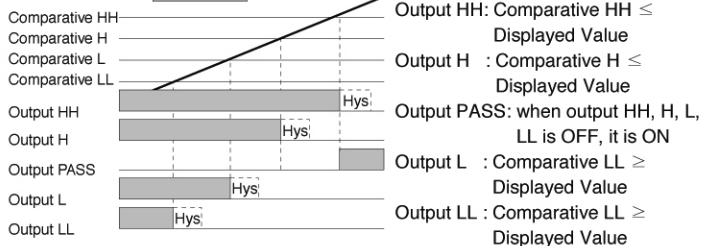
Zone Output out-3 Mode



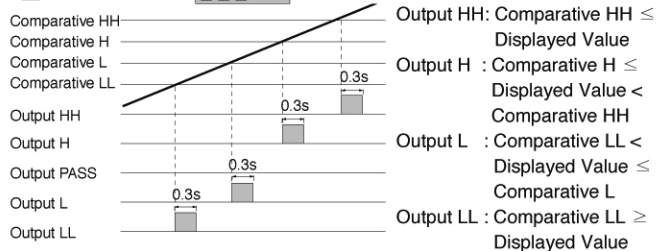
H Level out-H Mode



L Level out-L Mode



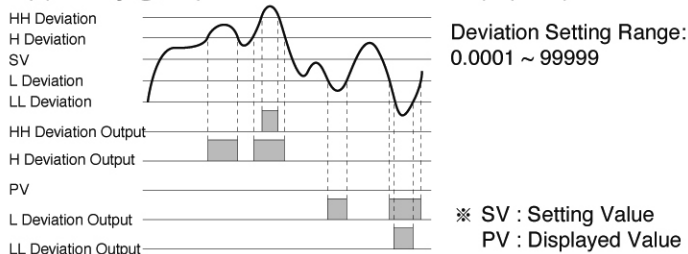
ONE short out-F Mode



Double Deviation out-d Mode

In the case of outputting when the SV is set and it is higher than HH deviation, H deviation, L deviation, LL deviation from the SV

- SV Auto Setting: The present displayed value is saved by pressing the front + keys
- SV Manual Setting or Deviation Setting: This is a manual setting method that SV or HH deviation, H deviation, L deviation, LL deviation are set by pressing +
- SV display: The saved SV is displayed SV by pressing key and if by pressing key one more time then it will display the present value



Function Description

Auto Zero Time (note 3)

The function is that if there is no input value in the time which is set as Auto Zero Value, then the displayed value will be "00000" by compulsion. In the case of there is no pulse input in a period of time or the predicting setting when the stop of the revolving object will be occurred, it can be set and used the time as the setting time of Auto Zero.

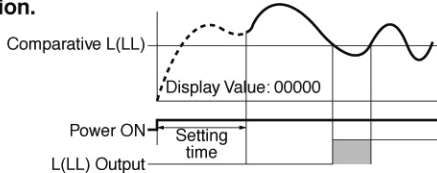
- The setting time of Auto Zero is from 0.1 sec. to 9999.9 sec.

Starting Compensation Timer Function (note 5)

After turning the power ON, as invalidating the measurement in the some periods of time, the function limits the faulty output caused by the faulty value which is affected by the chattering or inputting the starting current or etc. irregularly.

Specially, when starting the revolving object, it validates in the case that it does not make the comparative (L, LL) judgment by the low speed revolution operation.

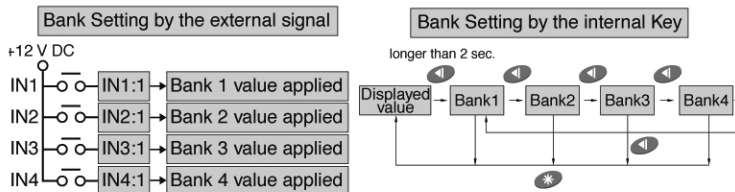
- The setting time of the starting compensation from 0.1 sec. to 99.9 sec.



Bank Conversion Function (note 5)

It is possible to register and control the comparative setting value, the prescale value and etc. as dividing 4 types. The setting value is changed by the device's setting or it validates the change of the prescale value caused by changing the speed ratio of the transmission and the bank can be immediately changed by the front keys or the external signals.

- For the DISPLY Only Model, BP6-5AN, the bank conversion is not possible.
- After selecting for each bank, the displayed value is indicated after the setting if you press Key.



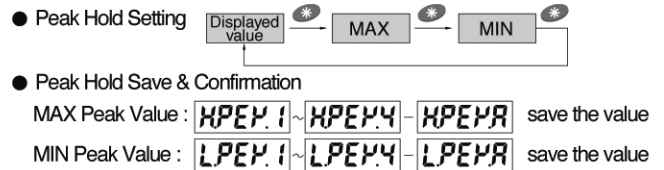
Time Unit Selection Function (note 5)

As selecting the measurement value in the various time units, the function displays the values efficiently.

- The time unit function can display after selecting one between the decimal system and sexagesimal system.
- The time unit is applied only for F3, F4, F5, F6 mode

Peak Hold or Reset Function (note 4)

This function displays MAX value and MIN value in the comparative values. It is possible to select a function by the one-touch button.



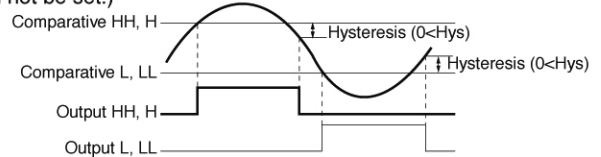
Display Cycle Setting Function (note 5)

This is the function which can change the cycle about the display cycle of the displayed value so that it displays in the time unit of the set cycle. Setting Display Cycle = 0.05/0.5/1/2/4/8 sec.

Hysteresis Function (note 5)

In the case of the measured value becomes unstable around the comparative value, set the hysteresis value from the setting value in order to prevent the unstable operation in the output.

For the comparative value HH, H, the decreased value is applied as the hysteresis value and for the comparative value LL, L, the increased value is applied as the hysteresis value. (The default setting is 1 and 0 can not be set.)



Note 3) It is possible to change it in the parameter group, ③ Setup Group (I/O Setting)

Note 4) Each MAX, MIN peak values of as 4 stages

Note 5) It is possible to set it as the batch/bank in the hysteresis, time unit and display among the parameter group, ④ Option Group (Option Setting).

If the batch setting is selected, it is possible to set in ③ Setup Group (I/O Setting) and if the single setting is selected, it is possible to set in ② PS Group (Prescale or Time Option Setting).

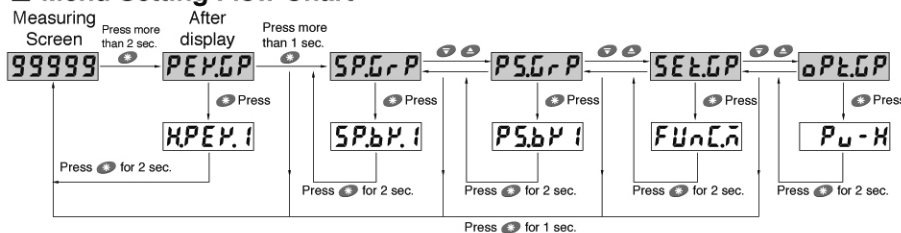
Batch setting (ALL) mode: The selected value is set as the batch setting. Ex) In the case of inputting 1 in the hysteresis value, 1 is applied to the all comparative values.

Single setting (Single) mode: the value is set for each bank.

Ex) It applies the proper value for the comparative characteristic of each bank as inputting the Hys value in the comparative value bank1:1, bank2:2, bank3:3, bank4:4.

Parameter Description

Menu Setting Flow Chart



Parameter Group Flow Chart

① SP Group (Comparative Setting Group) (note 6)

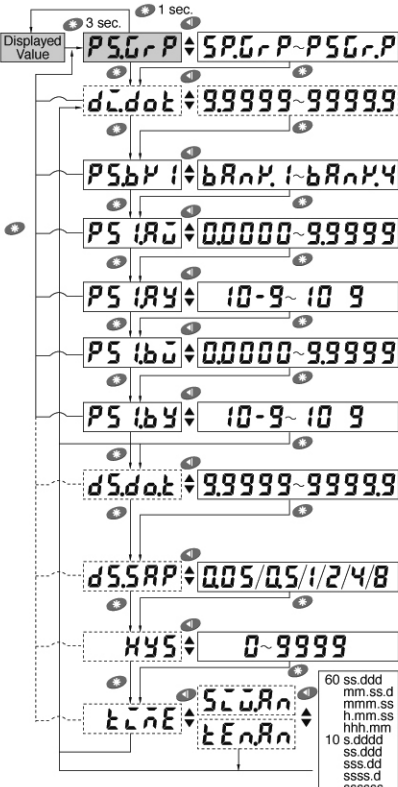
Setting Menu	Meaning	Setting Contents	Default
Displayed Value: 3 sec. 1 sec. SPGP	Comparative Setting Group Selection	Set each the output condition (HH, H, GO, L, LL) in the comparative setting group	
SPbP.1 ~ bRP.4	Bank Setting	bRP.1 ~ bRP.4	bRP.1
SP HH: 19999-99999	Comparative HH Setting	From the input operation mode (setting at ③ Setup Group I/O setting)), the setting range which depends on the setting)	00000
SP H: 19999-99999	Comparative H Setting	• F1, F2, F7, F8, F9, F12, F14 : 0 ~ 99999	00000
SP L: 19999-99999	Comparative L Setting	• F3, F4, F5, F6 : 0 ~ set time range	00000
SP LL: 19999-99999	Comparative LL Setting	• F11, F13 : -19999 ~ 99999	00000

Note 6) the display only product, BP6-5AN and the non-main output product, BP6-5A6, are not displayed like the above parameter comparative setting group. If each parameter is set and the hysteresis value is inputted, you can stably obtain the desired output.

Key Description

- : it is used for entering into the parameter menu and the group, moving modes and the confirmation when setting values.
- : it is used when entering into the parameter mode and moving its digit when setting values.
- : it is used when moving the parameter group and decreasing the setting values.
- : it is used when moving the parameter group and increasing the setting values.

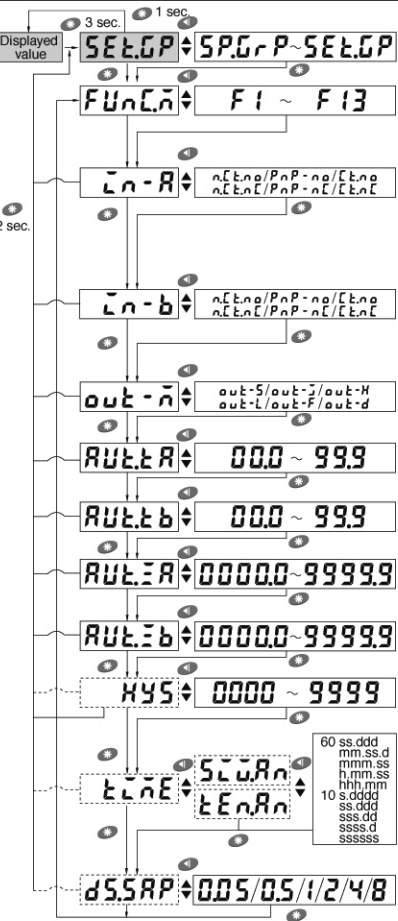
② PS Group (Prescale or Time Option Setting Group)

Setting Menu	Meaning	Setting Contents	Default
	Prescale Setting Group Selection	Comparative's prescale value selection	
	Batch setting for the decimal point of displayed value regardless banks	When setting the option setting group, oPLeGP-ddoEo-RLl the menu is displayed and it is possible to do the batch setting regardless banks. ^(note7) 99999-99999-99999-99999-99999	99999.
	Bank Selection	bRnY.1~bRnY.4 * Example of applying prescale when measuring counting	bRnY.1
	IN A's prescale mantissa (X) setting	000000~99999 From the addition count mode, if you want the counting to be increased by 1 after inputting 100 pulses, Set	100000
	IN A's prescale exponent (Y) setting	10-9~10 9 (10°~10°) Mantissa (X): 1.0000, exponent (Y):10-2or	10 0
	IN A's prescale mantissa (X) setting	000000~99999 Mantissa (X): 0.01000, exponent (Y):10 0	100000
	IN B's prescale exponent (Y) setting	10-9~10 9 (10°~10°) Then you will obtain the same value.	10 0
	For each bank, the displayed value's decimal point setting	When setting the option setting group, oPLeGP-ddoEo-SLnGL the menu is displayed and it is possible to set the decimal setting individually for each bank. 99999-99999-99999-99999-99999	99999.
	For each bank, the displayed value's cycle setting	When setting the option setting group, oPLeGP-dSSRP-SLnGL the menu is displayed and it is possible to set the display sampling cycle individually for each bank. ^(note7) 005-05-1-2-4-8 setting unit: sec.	005
	For each bank, the output's hysteresis setting ^(note8)	When setting the option setting group, oPLeGP-HYSa-SLnGL the menu is displayed and it is possible to set the hysteresis value individually for each bank. ^(note7) 0000-9999	0000
	For each bank, input time unit setting (operation mode F3, F4, F5)	When setting the option setting group, oPLeGP-tLnEa-SLnGL the menu is displayed and it is possible to set the time setting value individually for each bank. ^(note7) 10-55555-55555-55555-55555-55555 60-55555-55555-55555-55555-55555	55555

(note 7) For **dLdote**, **dSdote**, **dSSRP**, **HYS**, **tLnE** from the parameter group ④ Option Group (Option Setting), the screen display will turn ON/OFF according to the bank setting of each item. Among the parameter group ④ Option Group (Option Setting), if the hysteresis, time unit and display are selected by the batch setting, it is possible to set in ③ Setup Group (IN/OUT setting group)

(note 8) **HYS** parameter is not displayed in the model, BP6-5AN

③ Setup Group 3 (IN/OUT setting group)

Setting Menu	Meaning	Setting Contents	Default
	Input/Output control setting group selection	Input/Output setting in the Input/Output control setting group	
	Input Operation Mode Setting	F1~F13	F1
	IN A' sensor type setting	nLnEo : NPN Normal Open nLnEc : NPN Normal Close PnPo : PNP Normal Open PnPoc : PNP Normal Close LnEo : NPN Normal Open LnEc : Contact Normal Close nLnEo-nLnEc-PnPoc-PnPoc-LnEo-LnEc	nLnEo
	IN B' sensor type setting	nLnEo : NPN Normal Open nLnEc : NPN Normal Close PnPo : PNP Normal Open PnPoc : PNP Normal Close LnEo : NPN Normal Open LnEc : Contact Normal Close nLnEo-nLnEc-PnPoc-PnPoc-LnEo-LnEc	nLnEo
	Output mode setting	out-5-out-3-out-H-out-L-out-F-out-d	out-5
	IN A's start compensation timer setting	000~999 setting unit: sec.	000
	IN B's start compensation timer setting	000~999 setting unit: sec.	000
	IN A's Auto Zero timer setting	00000~99999 setting unit: sec.	00000
	IN B's Auto Zero timer setting	00000~99999 setting unit: sec.	00000
	Batch hysteresis setting ^(note10)	When setting the option setting group, oPLeGP-HYSa-RLl the menu is displayed and it is possible to batch-set the hysteresis value ^(note9) 0000~9999	0000
	Batch time unit setting	When setting the option setting group, oPLeGP-tLnEa-SLnGL the menu is displayed and it is possible to set the time setting value individually for each bank. ^(note9) 10-55555-55555-55555-55555-55555 60-55555-55555-55555-55555-55555	55555
	Display cycle setting in the batch display	When setting the option setting group, PRrCY-dSSRP-RLl the menu is displayed and it is possible to batch-set the display sampling cycle for each bank. 005-05-1-2-4-8 setting unit: sec.	005

(note 9) For **HYS**, **tLnE**, **dSSRP** from the parameter group ④ Option Group (Option Setting), the screen display will turn ON/OFF according to the bank setting of each item. Among the parameter group ④ Option Group (Option Setting), if the hysteresis, time unit and display are selected by the batch setting, it is possible to set in ② PS Group (prescale or time option setting)

(note 10) **HYS** parameter is not displayed in the model, BP6-5AN

④ Option Group 4 (Option setting group)

Setting Menu	Meaning	Setting Contents	Default
	Option setting group selection	Set the option of the input/output setting item in the option setting group	
Pu-H 19999-99999	PV transmission output's high limit value setting (note 11)	Setting range according to the input operation mode (③ Setup Group setting in the I/O setting) • F1, F2, F7, F8, F9, F12, F14 : 0 ~ 99999 • F3, F4, F5, F6 : 0 ~ set time range • F11, F13 : -19999 ~ 99999	99999
Pu-L 19999-99999	PV transmission output's low limit value setting		00000
HYS.o ALL / S.Cn.GL	Hysteresis Batch/bank setting Option setting (note 11) (note 12)	ALL : Hysteresis batch setting (ALL) S.Cn.GL : Hysteresis bank setting (Single) ALL-S.Cn.GL	ALL
t.Cn.E.o ALL / S.Cn.GL	Time unit Batch/bank setting Option setting (note 11) (note 12)	ALL : Time unit batch setting (ALL) S.Cn.GL : Time unit bank setting (Single) ALL-S.Cn.GL	ALL
d.d.o.t.o ALL / S.Cn.GL	Decimal point position Batch/bank setting Option setting (note 11) (note 12)	ALL : Decimal point position batch setting (ALL) S.Cn.GL : Decimal point position bank setting (Single) ALL-S.Cn.GL	ALL
d.SSRP ALL / S.Cn.GL	Display sampling cycle Batch/bank setting Option setting (note 11) (note 12)	ALL : Display sampling cycle batch setting (ALL) S.Cn.GL : Display sampling cycle bank setting (Single) ALL-S.Cn.GL	ALL
Addr.n 00-99 채널	Communication id setting (note 11)	00~99	00
bPS 2400/4800/9600	Communication speed setting (note 11)	2400-4800-9600 setting unit: bps	2400
r.no.t.C r.E.n.o.t / Lo.C.RL	Remote control setting (note 11)	r.E.n.o.t : Remote control from the outside (remote) Lo.C.RL : Local operation only (Local) r.E.n.o.t-Lo.C.RL	Lo.C.RL
n.E.n.o.r on / off	Power failure compensation setting (note 13)	on : Power failure (backup)-it memories the previous measured value when power is ON/OFF off : power failure mode is not used on-off	off
Pro.CY off/Lo.C.Y.1/Lo.C.Y.2/Lo.C.Y.3/Lo.C.Y.4	Parameter lock setting	off : all mode cancellation Lo.C.Y.1 : P1 ~ P3 Lock Lo.C.Y.3 : P3 ~ P4 Lock ALL : P1 ~ P4 Lock Lo.C.Y.2 : P2 ~ P4 Lock Lo.C.Y.4 : only P4 Lock off-Lo.C.Y.1-Lo.C.Y.2-Lo.C.Y.3-Lo.C.Y.4-ALL	on

(note 11) the parameters, Pu-H, Pu-L, HYS.o, bPS, r.no.t.C can not be displayed according to the specification so that please refer to the parameter table for each series.

(note 12) if the batch setting is selected, the setting value can be changed in the ③ Setup Group (I/O setting) and if the single setting is selected, the setting value can be changed in the ② PS Group (prescale or time option setting)

(note 13) the power failure compensation mode is only operated in the F9 addition counter mode.

⑤ Peak Display Group 5 (Peak Value Save Group) (note 14)

Setting Menu	Meaning	Setting Contents	Default
	Peak value save group	Save the MAX, MIN peak value of the measured values to the 10 memories	
H.P.C.Y.1 HIGH peak value 1 display	1st value of HIGH peak	Save the highest number of the measured value	00000
H.P.C.Y.2 HIGH peak value 2 display	2nd value of HIGH peak	Save the second highest number of the measured value	00000
H.P.C.Y.3 HIGH peak value 3 display	3rd value of HIGH peak	Save the third highest number of the measured value	00000
H.P.C.Y.4 HIGH peak value 4 display	4th value of HIGH peak	Save the fourth highest number of the measured value	00000
H.P.C.Y.A Average Value display of HIGH peak value	Average value of 4 HIGH peaks	Save the average value after taking the average of the 4 saved HIGH peak values	00000
L.P.C.Y.1 LOW peak value 1 display	1st value of LOW peak	Save the fourth lowest number of the measured value	00000
L.P.C.Y.2 LOW peak value 2 display	2nd value of LOW peak	Save the third lowest number of the measured value	00000
L.P.C.Y.3 LOW peak value 3 display	3rd value of LOW peak	Save the second lowest number of the measured value	00000
L.P.C.Y.4 LOW peak value 4 display	4th value of LOW peak	Save the lowest number of the measured value	00000
L.P.C.Y.A Average value display of LOW peak	Average value of 4 LOW peaks	Save the average value after taking the average of the 4 saved LOW peak values	00000
P.n.C.L.r CL.o.Y- CL.E.A.r	Erase the memory of the peak value (note 15)	Erase all the saved values	CL.o.Y-

(note 14) the saved peak values are automatically erased when changing modes.

(note 15) the saved values in the Peak Display Group can not be erased individually, they can be erased by batch.