

Autonics

**PULSE METER
MP5W SERIES**

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- ※Please keep these instructions and review them before using this unit.
- ※Please observe the cautions that follow;
- Warning** Serious injury may result if instructions are not followed.
- Caution** Product may be damaged, or injury may result if instructions are not followed.
- ※The following is an explanation of the symbols used in the operation manual.
- ⚠caution:Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required.**
It may result in serious damage, fire or human injury.
- It must be mounted on panel.**
It may give an electric shock.
- Do not repair or check up when power on.**
It may give an electric shock.
- Do not disassemble and modify this unit, when it requires. If needs, please contact us.**
It may give an electric shock and cause a fire.
- Please check the number of terminal when connect power line or measuring input.**
It may cause a fire.

Caution

- This unit shall not be used outdoors.**
It might shorten the life cycle of the product or give an electric shock.
- When wire connection for power input and measuring input, the tightening strength for screw bolt on terminal block should be over than 0.74N · m ~ 0.90N · m.**
It may result in malfunction or fire due to contact failure.
- Please observe specification rating.**
It might shorten the life cycle of the product and cause a fire.
- Do not use the load beyond rated switching capacity of Relay contact.**
It may cause insulation failure, contact melt, contact failure, relay broken, fire etc.
- In cleaning the unit, do not use water or an oil-based detergent.**
It might cause an electric shock or fire that will result in damage to this product.
- Do not use this unit at place where there are flammable or explosive gas, humidity, direct ray the sun, radiant heat, vibration, impact etc.**
It may cause a fire or explosion.
- Do not inflow dust or wire dregs into inside of this unit.**
It may cause a fire or mechanical trouble.
- Please connect properly after checking the polarity of measuring terminals.**
It may cause a fire or explosion.

※The above specification are changeable without notice anytime.

Ordering information

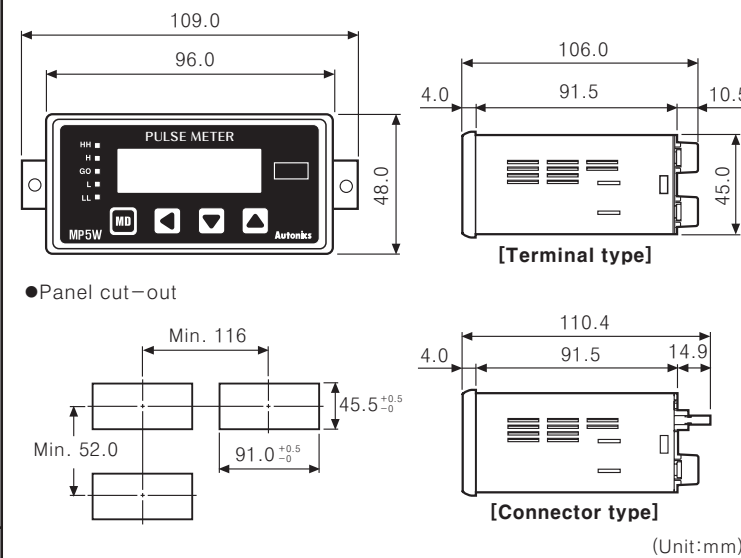
①Series	MP	Pulse meter
②Digit	5	5Digit(99999)
③Size	W	DIN Size W96 × H48mm
④Power supply	4	100-240VAC 50/60Hz
⑤Output (Main output +Sub output)		
Symbol	Main output(Comparative value output)	Sub output(Display value output)
N	Indication type only	X
A	Relay five-stage(HH, H, GO, L, LL)	X
1	Relay three-stage(H, GO, L)	X
2	NPN open collector five-stage output	BCD Dynamic output
3	PNP open collector five-stage output	BCD Dynamic output
4	NPN open collector five-stage output	PV retransmission(4-20mADC) output
5	PNP open collector five-stage output	PV retransmission(4-20mADC) output
6	NPN open collector five-stage output	Low speed serial output
7	PNP open collector five-stage output	Low speed serial output
8	NPN open collector five-stage output	RS485 communication output
9	PNP open collector five-stage output	RS485 communication output

※PNP open collector output:Option

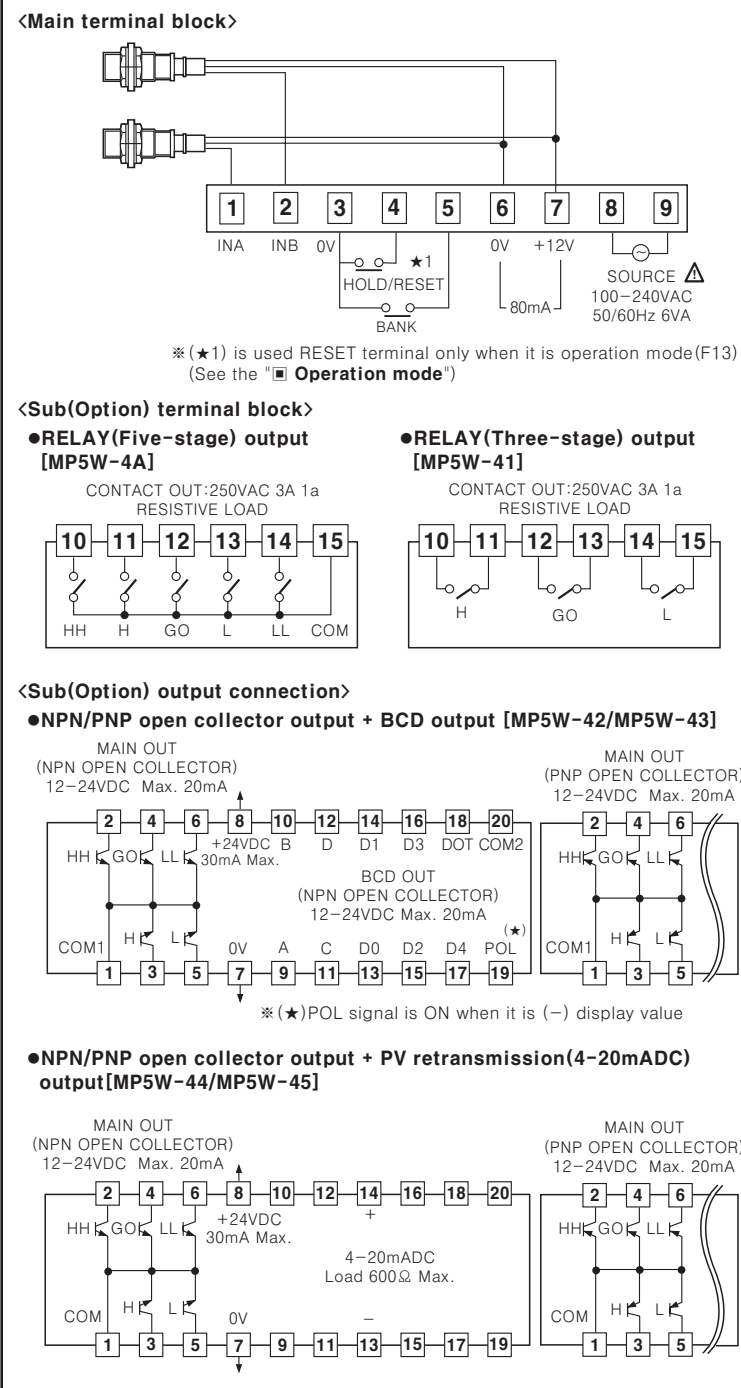
Specifications

Model	MP5W	
Power supply	100-240VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	Approx. Max. 6VA	
Power for external sensor	12VDC ±10%, 80mA	
Measuring accuracy (23 ±5°C)	• Mode F1, F4, F7, F8, F9, F10 : F.S. ±0.05% rdg ±1Digit • Mode F2, F3, F5, F6 : F.S. ±0.01% rdg ±1Digit	
Measuring range	• Mode F1, F4, F7, F8, F9, F10 : 0.0005Hz to 50kHz • Mode F3 : 0.02s to 3,200s • Mode F2, F5, F6 : 0.01s to 3,200s • Mode F11, F12, F13 : 0 to 4 × 10 ⁹ Count	
Input frequency	• Solid state input : Max. 50kHz(Pulse width:Min. 10μs) • Contact input : Max. 45Hz(Pulse width:Min. 11ms)	
Input level	[Voltage input] High : 4.5-24VDC, Low : 0-1VDC, Input impedance : 4.5kΩ [No-voltage input] Short-circuit impedance : Max. 300Ω, Residual voltage : Max. 1V, Open-circuit impedance : Min. 100kΩ	
Max. indication	5digit(-19999 to 99999)	
Display method	7 Segment LED(Zero Blanking)	
Display accuracy	0.05 / 0.5 / 1 / 2 / 4 / 8sec.(The same as update output cycle)	
Operation mode	Number of revolution/Speed/Frequency(F1), Passing speed(F2), Cycle(F3), Passing time(F4), Time width(F5), Time difference(F6), Absolute rate(F7), Error ratio(F8), Density(F9), Error(F10), Length measurement(F11), Interval(F12), Integration(F13)	
Prescale function	Direct input method(0.0001 × 10 ⁻⁹ to 9.9999 × 10 ⁹)	
Hysteresis	0 to 9999	
Other functions	• Lock setting function • Monitoring delay function • Auto-Zero time setting function • Monitoring function : Memorize max. value or min. value • Current output range selection(Current output type only) • Remote/Local switching function(Communication output type only) • Comparative output function(HH, H, GO, L, LL) • Data Bank switching function • Time unit selection function • Memory retention function(Mode F13 applied only) • Deviation memory function(F output mode applied only) ※Please see the last page for the detail.	
Output form	• Relay contact output(Three-stage output:3a) (Five-stage output:5a contact):Comparative output, Alarm output • Transistor output(NPN/PNP open collector) :Comparative output, Alarm output • Low speed serial output:Display value output • BCD Dynamic output:Display value output • PV retransmission output(4-20mADC):Display value output • RS485 communication output(32 channel) :Display value output, Comparative output, PC setting function	
Memory	Non-volatile memory(Input times : 100,000 times)	
Insulation resistance	Min. 100MΩ(Standard 500VDC) between terminal and case	
Dielectric strength	2000VAC 60Hz 1minute(Between terminals of AC power and case, Between terminals of AC power and measuring terminals)	
Impulse noise strength	±2000V the square wave noise(pulse width:1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s ² (Approx. 30G) 3 times at X, Y, Z direction
	Malfunction	100m/s ² (Approx. 10G) 3 times at X, Y, Z direction
Relay life cycle	Mechanical	Min.10,000,000 times
	Electrical	Min.100,000 times(250VAC 3A resistive load)
Ambient temperature		-10 to 50°C(at non-freezing status)[]
Storage temperature		-20 to 60°C(at non-freezing status)[]
Ambient humidity		35 to 85%RH
Weight		Approx. 230g

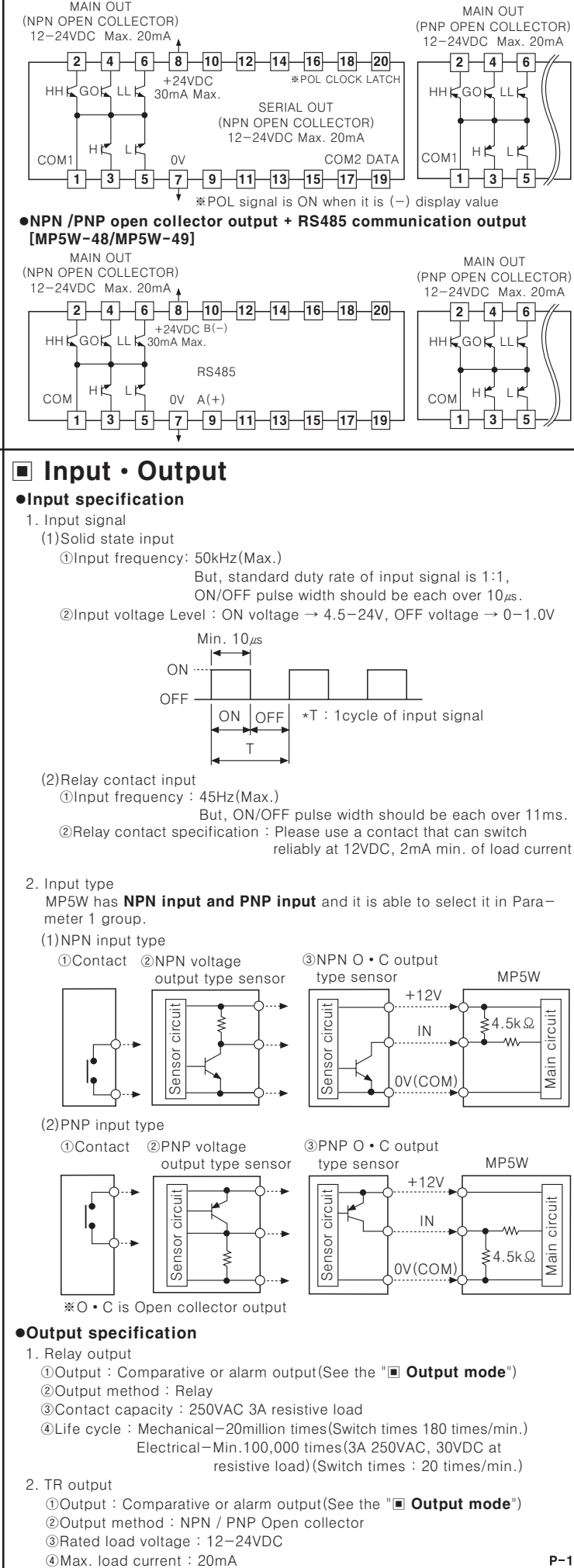
Dimensions



Connections

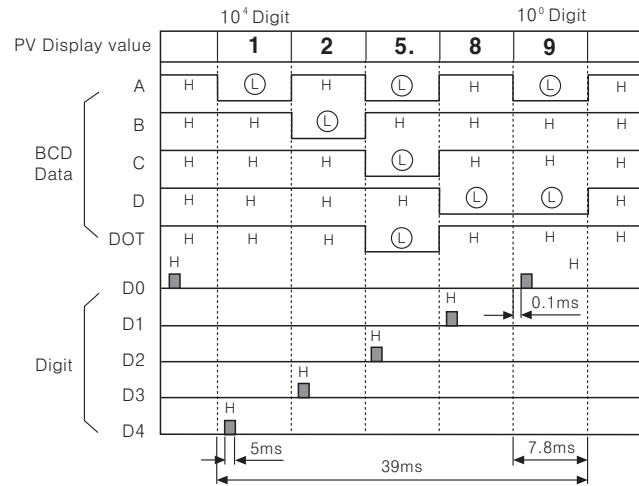


Input · Output



3. BCD Dynamic output

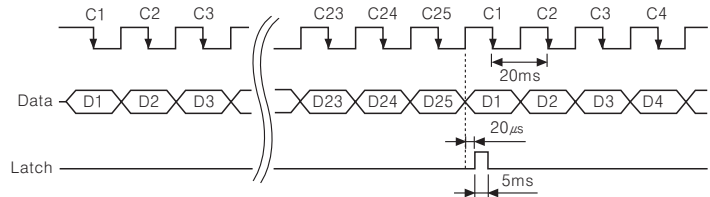
- ①Output : Display value
- ②Output signal : BCD Data(A, B, C, D) ← A : Lowest bit, D : Highest bit
Digit Data(D0, D1, D2, D3, D4) ← D0 : Lowest digit, D4 : Highest digit
- ③Output type : NPN Open Collector
- ④Rated load voltage : 12-24VDC
- ⑤Max. load current : 20mA
- Ex) When display value is 125.89



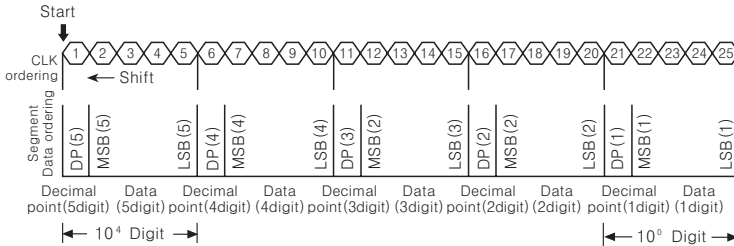
4. Low speed serial output

- ①Output : Display value
- ②Output signal : CLK, Data, Latch
- ③CLK cycle : 50Hz
- ④Output CLK bit : 25 bit
- ⑤Output Data bit : 25 bit
- ⑥Output form: NPN Open Collector
- ⑦Rated load voltage : 12-24VDC
- ⑧Max. load current : 20mA

Serial retransmission time diagram

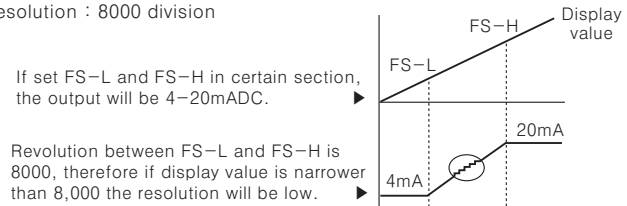


Data output sequence when it is serial retransmission



5. PV retransmission output(4-20mADC)

- ①Application : To transmit the measured value
- ②Function : This function is to transmit 4-20mADC converted from measured display value between High limit output(FS-H) and Low limit(FS-L).
- ③Range of High/Low limit output setting
 - High limit setting range(FS-H): From min. to max within range of measurement
 - Low limit setting range(FS-L): From min. to max within range of measurement (FS-H should be over "1" bigger than FS-L)
- ④Resistive load : Max. 600Ω
- ⑤Resolution : 8000 division



6. RS485 communication output

- ①Address : 0 ~ 99 address(32 channel)
- ②Retransmission speed(Baud rate) : 2400/4800/9600 bps
- ③Retransmission code : ASCII
- ④Parity Bit : No
- ⑤Data Bit : 8 Bit
- ⑥Stop Bit : 1 Bit
- ⑦Communication items
 - MP5W ← PC : Comparative value of each bank data, Prescale value and Peak value, RESET control
 - MP5W → PC : Comparative value of each bank data, Prescale value and Peak value, Display value

Operation mode

- Select operation mode from **mode**(mode) of Parameter 1 group.
- There are 13 kinds of operation mode in this unit.

Mode F1(Frequency/Number of revolution/Speed)

This mode is to display calculated frequency or number of revolution, speed by measuring frequency of Input A.

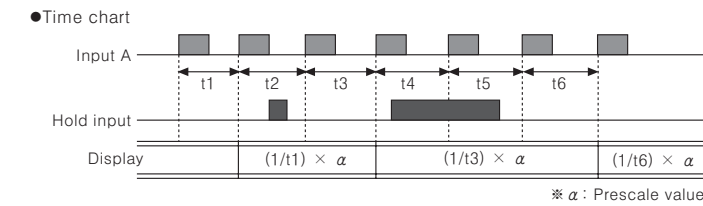
- 1) Frequency(Hz) = $f \times \alpha$ ($\alpha = 1[\text{sec}]$)
- 2) Number of revolution(rpm) = $f \times \alpha$ ($\alpha = 60[\text{sec}]$)
- 3) Speed(m/min) = $f \times \alpha$ ($\alpha = 60L[\text{sec}]$)

* L = The length of conveyor moved for 1 pulse cycle[m]

• Display value and display unit

Display value	Display unit	α (Prescale value)
Frequency	Hz	1
	kHz	0.001
Number of revolution	rps	1
	rpm	60
Speed	mm / sec	1,000L
	cm / sec	100L
	m / sec	L
	m / min	60L
	km / hour	3.6L

* Display unit of factory default : rpm



Mode F2(Passing speed)

It displays the passing speed between ON of input A and ON of input B.

Passing speed(V) = $f \times \alpha$ ($\alpha = L[\text{m}]$)

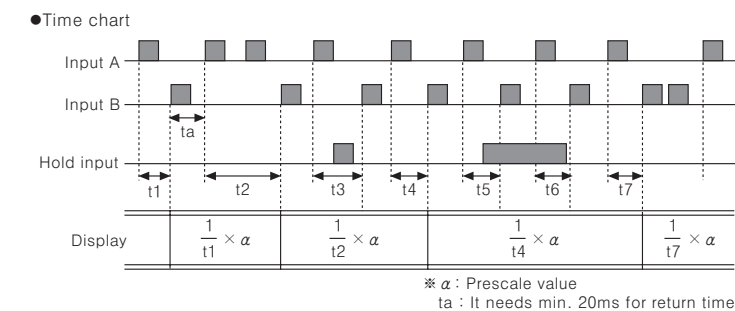
* f : This is reciprocal number of the time between ON of input A and ON of input B

L : The distance between input A and input B[m]

• Display value and display unit

Display value	Display unit	α (Prescale value)
Passing speed	mm / sec	1,000L
	cm / sec	100L
	m / sec	L
	m / min	60L
	km / hour	3.6L

* Display unit of factory default : m/sec



Mode F3(Cycle)

It displays the time from when input A is ON to the next ON of input A.

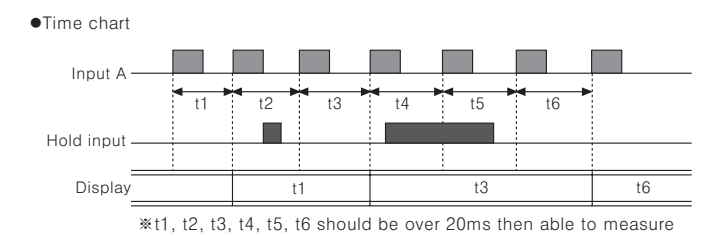
Cycle(T) = t

* t : Measurement time[sec]

• Display value and display unit

Display value	Display unit	SEC	MIN
Cycle		999.99sec.	999.99min.
		9999.9sec.	9999.9min.
		99min.	99hour 99min.
		59.9sec.	59.9min.
		9hour 59min. 59sec.	999hour 59min. 59sec.
		99999sec.	99999min.

* Set the display unit at the **Unit**(Time unit) of Parameter 2.
* Display unit of factory default : 999.99sec.



Mode F4(Passing time)

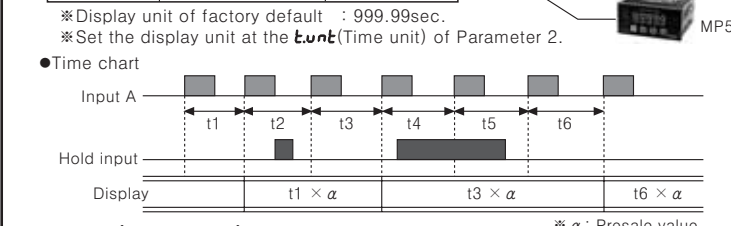
It displays the passing time of certain distance as measuring the time between ON and the next ON of Input A.

Passing time[sec] = $t \times \alpha$ ($\alpha = \frac{L[\text{m}]}{\text{Moving distance within 1 pulse cycle}[\text{m}]}$)

• Display value and display unit

Display value	Display unit	
Passing time	SEC	MIN
	999.99sec.	999.99min.
	9999.9sec.	9999.9min.
	99hour 59.9sec.	99hour 59.9min.
	9hour 59min. 59sec.	999hour 59min. 59sec.
	99999sec.	99999min.

* t : Measurement time[sec]
* L : Certain distance[m]



Mode F5(Time width)

It displays the ON time of input A.

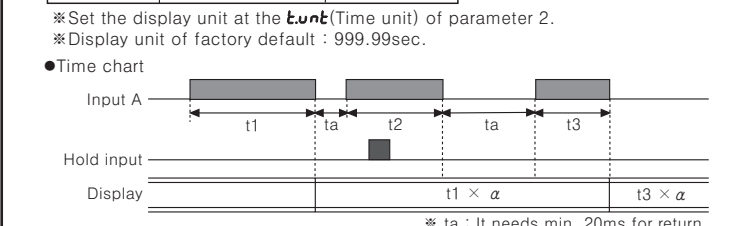
Time width[T] = t

* t : ON measurement time of input A[sec]

• Display value and display unit

Display value	Display unit	
Passing time	SEC	MIN
	999.99sec.	999.99min.
	9999.9sec.	9999.9min.
	99hour 59.9sec.	99hour 59.9min.
	9hour 59min. 59sec.	999hour 59min. 59sec.
	99999sec.	99999min.

* Set the display unit at the **Unit**(Time unit) of parameter 2.
* Display unit of factory default : 999.99sec.



Mode F6(Time interval)

It displays the time from input A is ON to input B is ON.

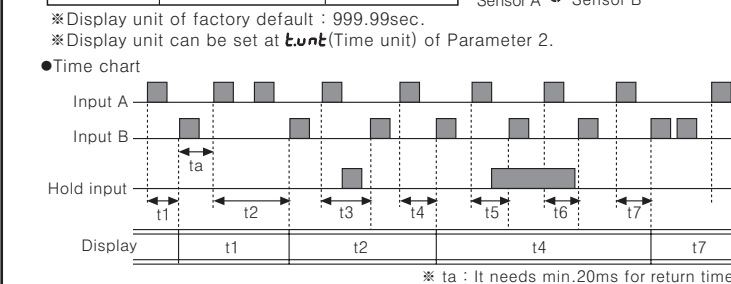
Time difference(T) = t(ta to tb)

* t(ta to tb): The measurement time from input A is ON to input B is ON[sec]

• Display value and display unit

Display value	Display unit	
Passing time	SEC	MIN
	999.99sec.	999.99min.
	9999.9sec.	9999.9min.
	99hour 59.9sec.	99hour 59.9min.
	9hour 59min. 59sec.	999hour 59min. 59sec.
	99999sec.	99999min.

* Display unit of factory default : 999.99sec.
* Display unit can be set at **Unit**(Time unit) of Parameter 2.

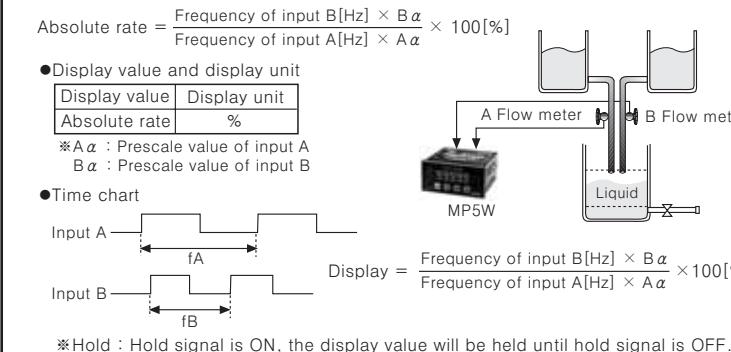


Mode F7(Absolute rate)

It displays how many percentage(%) faster or late, speed, volume etc. of Input B against input A

Absolute rate = $(\text{Input B} / \text{Input A}) \times 100\%$

Absolute rate = $\frac{\text{Frequency of input B}[\text{Hz}] \times B\alpha}{\text{Frequency of input A}[\text{Hz}] \times A\alpha} \times 100\%$

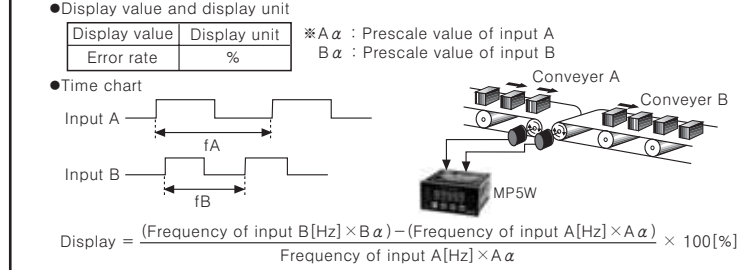


Mode F8(Error ratio)

It displays how many percentage(%) faster or late of Input B against Input A.

Absolute rate = $\frac{\text{Input B} - \text{Input A}}{\text{Input A}} \times 100\%$

Error rate = $\frac{(\text{Frequency of input B}[\text{Hz}] \times B\alpha) - (\text{Frequency of input A}[\text{Hz}] \times A\alpha)}{\text{Frequency of input A}[\text{Hz}] \times A\alpha} \times 100\%$

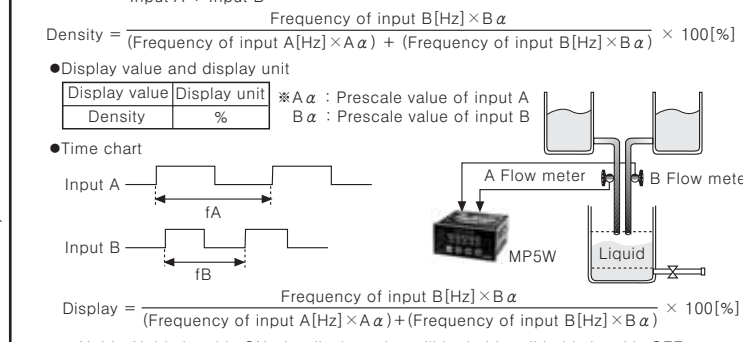


Mode F9(Density)

It displays the density rate of input B against total sum of input A and input B.

Density = $\frac{\text{Input B}}{\text{Input A} + \text{Input B}} \times 100\%$

Density = $\frac{\text{Frequency of input B}[\text{Hz}] \times B\alpha}{(\text{Frequency of input A}[\text{Hz}] \times A\alpha) + (\text{Frequency of input B}[\text{Hz}] \times B\alpha)} \times 100\%$

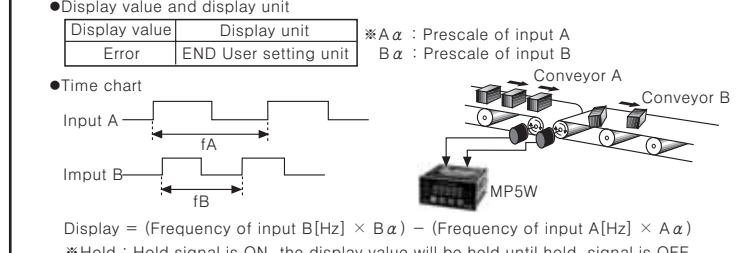


Mode F10(Error)

It displays the error between standard Input A and comparing Input B.

Error = Input B - Input A

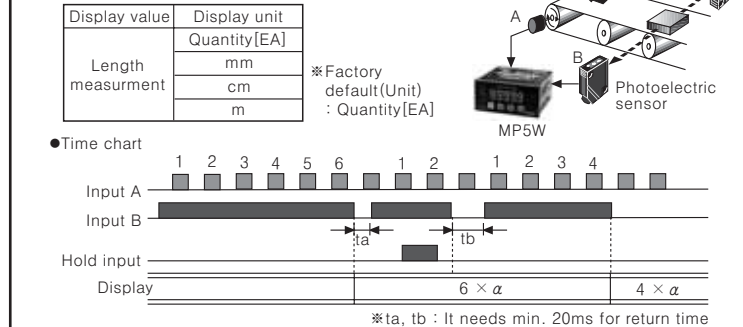
Error = $(\text{Frequency of input B}[\text{Hz}] \times B\alpha) - (\text{Frequency of input A}[\text{Hz}] \times A\alpha)$



Mode F11(Length measurement)

It displays the number of Input A pulse while Input B is ON.

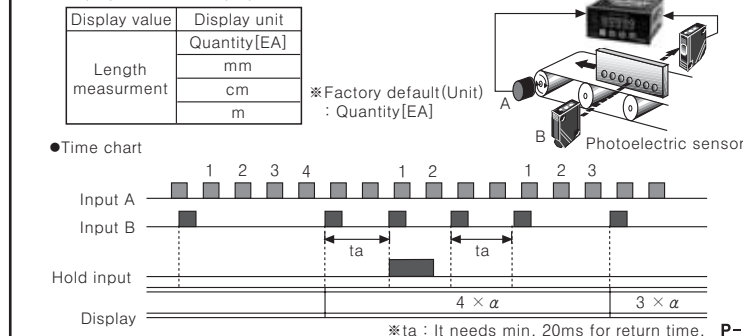
Length measurement = $P \times \alpha$ (* P : Number of input A pulse, α : Prescale value)



Mode F12(Interval)

It displays the number of Input A pulse from Input B is ON to the time Input B is ON next.

Interval = $P \times \alpha$ (* P : Number of input A pulse, α : Prescale value)



Mode F13(Integration)

It displays the counting value against pulses of Input A.
Integration = P × α

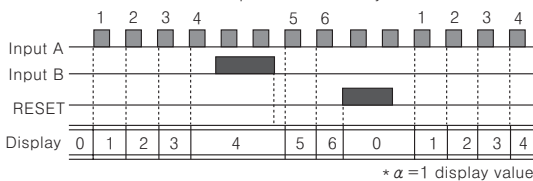
*P : Pulse number of input A, α : Prescale value

●Display value and display unit

Display value	Display unit
Interval	Quantity[EA]

●Operation and Time chart

①It counts the number of input A pulse.
②As input B is an enable input signal it stops the counting and display value of input A when it is ON and then it counts input A continuously when it is OFF.



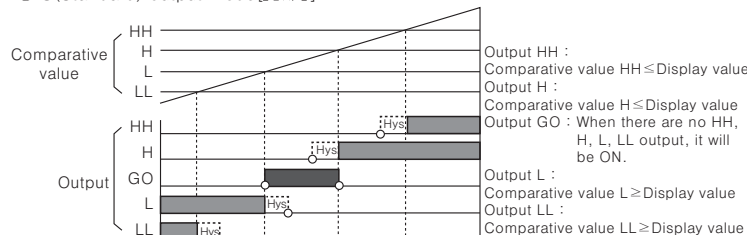
* α = 1 display value

Output mode

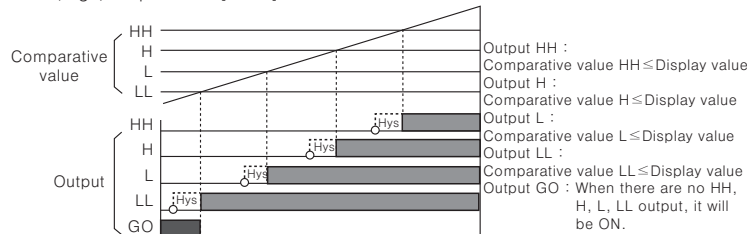
●Select output mode in **out-t**(output type) of Parameter1 group.
●There are 5 stages output(HH, H, GO, L, LL) and 3 stage output(H, GO, L).
●There are 6 kinds of output mode such as S(Standard) output mode, H(High) output mode, L(Low) output mode, B(Block) output mode, I(One shot)output mode, F(Deviation)output mode.

●The setting value(HH, H, L, LL) should be LL<L<H<HH in B comparative output type and it operates individually not related to the setting value(HH, H, L, LL) in others output(S, H, L, I).

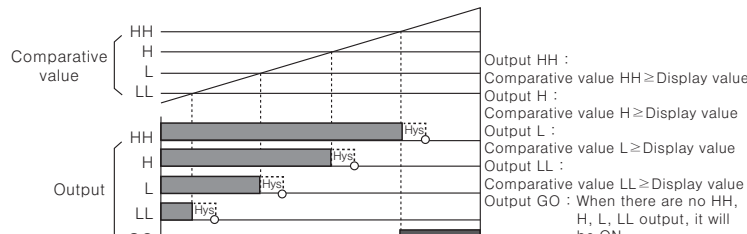
○ **S(Standard) output mode[StAr.d]**



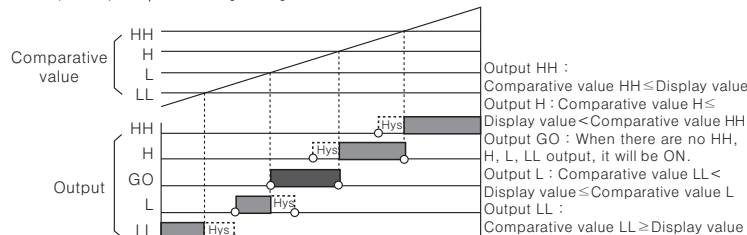
○ **H(High) output mode[out-h]**



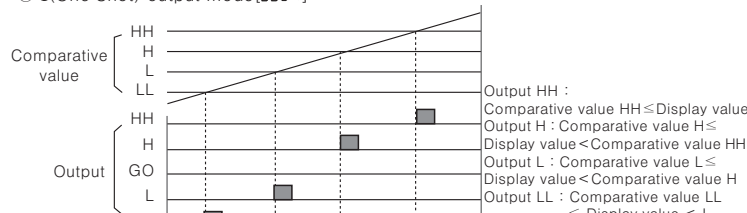
○ **L(Low) output mode[out-L]**



○ **B(Block) output mode[out-b]**



○ **I(One Shot) output mode[out-I]**



*There is no GO output in output I mode.
*One Shot(■) output time has been fixed 0.3sec.
*There is no Hysteresis in I(One shot) comparative output mode.

F(Deflection) output mode[out-F]

This function is to memorize the setting value and provide outputs when it exceeds the deviation of H, L.

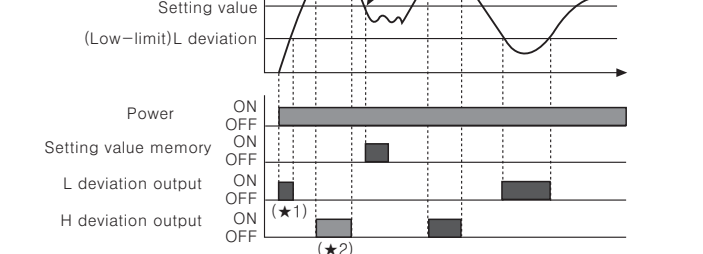
●The setting value memory : Memorize the current display value as the setting value by pressing(M+▲) key in front.

●Display the setting value : Check the memorized the setting value by (▲) key. (Display the memorized setting value for pressing ▲ key continuously.)

●Deviation setting : Set H, L deviation by setting value. (The set deviation will be memorized until set the next deviation again when power off.)

●Deviation setting range : 0.0001 to 99999(The setting range will be changed by decimal point setting parameter. If set decimal point as 0000.0, the setting range will be 0.1 to 9999.9.)

●Operation
Press (M+▲) Key at the same time for memorizing the setting value



*(★1)When select the comparative output limit function, output will not be come.
*(★2)Output position may different from above graph as output coming under assuming the setting value memory is before the setting value memory point on above graph.
*There are no HH, GO, LL outputs in F output mode.
*Even though you set the deviation as "0(Zero)", it will actually work as setting "1".

Operation chart by each Parameter group

●The display parameter are different by each operation mode, please see "Parameter".

●● : When select the operation mode, the parameter will be displayed.
X : When select the operation mode, the parameter will not be displayed.

Parameter 0 group

Parameter 0	Sub mode	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
PSt.hh		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.h		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.L		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.LL		●	●	●	●	●	●	●	●	●	●	●	●	●
h.PEK		●	●	●	●	●	●	●	●	●	●	●	●	X
L.PEK		●	●	●	●	●	●	●	●	●	●	●	●	X

Parameter 1 group

Parameter 1	Sub mode	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Mode		●	●	●	●	●	●	●	●	●	●	●	●	●
In-A		●	●	●	●	●	●	●	●	●	●	●	●	●
In-b		X	●	X	X	X	●	●	●	●	●	●	●	●
out-t		●	●	●	●	●	●	●	●	●	●	●	●	X
hys		●	X	X	X	X	●	●	●	●	●	X	X	X
GuAr.d	F.dEFy	●	●	●	●	●	●	●	●	●	●	●	●	X
	StAr.t	●	●	●	●	●	●	●	●	●	●	●	●	X
Auto.A		●	X	X	●	X	X	●	●	●	●	X	X	X
Auto.b		X	X	X	X	X	X	●	●	●	●	X	X	X
mEmo		X	X	X	X	X	X	X	X	X	X	X	X	●

*"O" : IN-b sensor will be set as nPn, h, F or PnP, h, F in mode F11, F12, F13.

Parameter 2 group

Parameter 2	Sub mode	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
P.bAnK		●	●	●	●	●	●	●	●	●	●	●	●	●
dot		●	●	X	X	X	X	●	●	●	●	●	●	●
t.un		X	X	●	●	●	●	X	X	X	X	X	X	X
PSt.hh		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.h		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.L		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.LL		●	●	●	●	●	●	●	●	●	●	●	●	●
PSC.A.x(Note1)		●	●	X	●	X	X	●	●	●	●	●	●	●
PSC.A.y(Note1)		●	●	X	●	X	X	●	●	●	●	●	●	●
PSC.b.H		X	X	X	X	X	X	●	●	●	●	X	X	X
PSC.b.y		X	X	X	X	X	X	●	●	●	●	X	X	X
dISp.t		●	X	X	X	X	X	●	●	●	●	X	X	X

*(Note1)PSC. x, PSC. y are displayed in mode F1, F2, F4, F11, F12, F13.

Parameter 3 group

Parameter 3	Sub mode	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
FS-h														
FS-L														
Addr														
bPS														
remot														
LoC		●	●	●	●	●	●	●	●	●	●	●	●	●

Monitoring delay function operation chart by each output mode

	out-t	StAr.d	out-h	out-L	out-b	out-I	out-F
Comparative output adjustment function.	●		X	X	●	X	●
Starting correction timer function	●		●	●	●	●	●

Parameter

Parameter 0 group

Menu and Parameter display	Parameter	Setting range	Setting key
<pre> RUN ├── MD Touch │ ├── PSt.hh → PSt.hh 99999 │ │ └── MD │ ├── PSt.h → PSt.h 99999 │ │ └── MD │ ├── PSt.L → PSt.L 00000 │ │ └── MD │ ├── PSt.LL → PSt.LL 00000 │ │ └── MD │ ├── h.PEK → h.PEK 99999 │ │ └── MD │ └── L.PEK → L.PEK -19999 │ └── MD └── MD Touch (★1) </pre>	<p>Set HH comparative value</p> <p>Set H comparative value</p> <p>Set L comparative value</p> <p>Set LL comparative value</p> <p>Display high peak value among measuring values</p> <p>Display low peak value among measuring values</p>	<p>●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999</p> <p>●F3 to F6 : 0 to Setting time range</p> <p>●F8, F10 : -19999 to 99999</p>	<p>◀ : Move the setting digit</p> <p>▼, ▲ : Change the setting value</p> <p>MD : Fix and move to the next parameter</p>
<p>●Reset If you press ◀ key for 2sec. while h.PEK or L.PEK is flickering, the Peak value display will be reset to the current measuring value and it will keep flickering. MD If you touch once again, it will return to L.PEK or RUN.</p>			

*(★1)If you press MD key in RUN mode, it will enter into PSt.hh(F output mode:PSt.h) at comparative output mode and h.PEK at indication type.
*When entering into parameter 0, the parameter and data will be flickering by 1 sec. then moving the setting digit and changing the setting value are available.
*It will show the set data to flicker by 1sec., then move to next Parameter with touching MD key once.

Parameter 1 group

Menu and Parameter display	Parameter	Setting range	Setting key
<pre> RUN ├── MD press 3sec. │ ├── PRr.A.1 → PRr.A.1 │ │ └── MD │ ├── nAdE → nAdE F1 │ │ └── MD │ ├── In-A → In-A nPn,hF │ │ └── MD │ ├── In-b → In-b nPn,hF │ │ └── MD │ ├── out-t → out-t StAr.d │ │ └── MD │ ├── hys → hys 0001 │ │ └── MD │ ├── GuAr.d → GuAr.d F.dEFY / StAr.t │ │ └── MD │ └── Auto.A → Auto.A 99999 │ └── MD └── MD </pre>	<p>This is parameter 1 group.</p> <p>Select operation mode.</p> <p>Set the sensor type of input A.</p> <p>Set the sensor type of input B.</p> <p>Select the output mode. (★1)</p> <p>Set the hysteresis for the output. (★2)</p> <p>Select the start compensating timer function or comparative output(L, LL) limit function. (★3)</p> <p>Set the Auto-zero time of INA input.</p> <p>Set the Auto-zero of INB input.</p> <p>It sets the memory retention. The measuring value will be memorized when the power off. (Mode F13 only)</p>	<p>F1 to F13</p> <p>PNP transistor output type : PnP,hF Contact output type(L output) : PnP,LF NPN transistor output type : nPn,hF Contact output type(H output) : nPn,LF</p> <p>StAr.d / out-h / out-L out-b / out-I / out-F</p> <p>0 to 9999 (If decimal point is set in 0000.0, the range will be 0 to 9999.)</p> <p>F.dEFY / StAr.t When [StAr.t] is flickering by 1sec. cycle, set the starting correction time 0.0 to 999.</p> <p>0.1 to 99999</p> <p>0.1 to 99999</p> <p>on : Memory retention off : No memory retention</p>	<p>▼, ▲ : Change the setting mode MD : Fix and move to the next parameter</p> <p>▼, ▲ : Change the sensor type MD : Fix and move to the next parameter</p> <p>▼, ▲ : Change the setting mode StAr.d → out-h → out-L out-F ← out-I ← out-b MD : Fix and move to the next parameter</p> <p>◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter</p> <p>① ▼, ▲ : Change the setting mode MD : Fix and move to the next parameter ② ◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter</p> <p>◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter</p> <p>▼, ▲ : Change the setting mode on → off MD : Fix and move to the next parameter nAdE</p>

*If press MD key for 3 sec. in RUN, it will enter into parameter 1 group.
*(★1)It will not be displayed in indication type.
The output mode is fixed as out-h type in F13 operation mode.
*(★2)Hysteresis operation mode is able to be set in F1, F7 to F10 operation mode.
*(★3)You are able to select the comparative output limit[F.dEFY] limit function or starting correction[StAr.t] timer in monitoring delay function mode.
When selecting the comparative output limit[F.dEFY] function, it will move to the next parameter[Auto.A] and when selecting the starting correction timer[StAr.t] you need to be set the starting correction time[0.0 ~ 999] so that it moves to the next parameter[Auto.A].
*If press MD key for over 2 sec. in every setting mode, data will be set and return to RUN.
*When entering into parameter 1 group, the parameter name and data will be flickering by 1 sec. then move setting digit by ◀ key or change the setting value by ▼, ▲ key.
*All data set by users will be shown[displayed] to 1sec. cycle then move to the next parameter by pressing MD key.

●Parameter 2 group

Menu and Parameter display	Parameter	Setting range	Setting key												
<p>RUN MD Press for 4sec.</p> <p>After displaying PAR.A2 for 2sec. then advance to PbAnL automatically. Pressing MD key before 1sec. it will move to PbAnL.</p> <p>PAR.A2 → PbAnL → P.bAnL → dot → t.unL → t.SEC → t.nIn</p>	This is parameter 2 group.														
	Select Data bank.	1 : Data bank 1 2 : Data bank 2	↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set decimal point position of display value	00000 00.000 00000 0.0000 00000	← : Move the decimal point MD : Fix and move to the next parameter												
	It will be displayed in F3, F4, F5, F6 operation mode and set the time unit. (★1)	<table border="1"> <thead> <tr> <th>SEC</th> <th>MIN</th> </tr> </thead> <tbody> <tr> <td>999.99sec.</td> <td>999.99min.</td> </tr> <tr> <td>9999.9sec.</td> <td>9999.9min.</td> </tr> <tr> <td>99min.59.9sec.</td> <td>99hour59.9min.</td> </tr> <tr> <td>9hour 59min.59sec.</td> <td>999hour59min.</td> </tr> <tr> <td>99999sec.</td> <td>99999min.</td> </tr> </tbody> </table>	SEC	MIN	999.99sec.	999.99min.	9999.9sec.	9999.9min.	99min.59.9sec.	99hour59.9min.	9hour 59min.59sec.	999hour59min.	99999sec.	99999min.	① ↓, ↑ : Change the setting mode MD : Save ② ↓, ↑ : Change the setting value MD : Fix and move to the next parameter
SEC	MIN														
999.99sec.	999.99min.														
9999.9sec.	9999.9min.														
99min.59.9sec.	99hour59.9min.														
9hour 59min.59sec.	999hour59min.														
99999sec.	99999min.														
	Set the comparative value HH.		← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the comparative value H.	●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the comparative value L.	●F3 to F6 : 0 to Setting time range	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the comparative value LL.	●F8, F10 : -19999 to 99999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the prescale value of input A mantissa(X).	00000 to 9.9999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the prescale value of input A an exponent(y).	10 - 9 to 10 9 (10 ⁻⁹ to 10 ⁹)	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the prescale value of input B mantissa(X).	00000 to 9.9999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Set the prescale value of input B an exponent(y).	10 - 9 to 10 9 (10 ⁻⁹ to 10 ⁹)	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter												
	Select the display cycle.	0.05 0.5 1 2 4 8	↓, ↑ : Change setting value MD : Fix and move to the next parameter												

*It will enter into parameter 2 if pressing MD key for 4sec in RUN mode
 (★1)It will be displayed in F3, F4, F5, F6 operation mode only and enable to select the time until as sec. [t.SEC] or min. [t.nIn] in t.unL parameter.
 Select the time range after selecting the time unit as sec. [t.SEC] or min. [t.nIn].
 *If press MD key for over 2 sec. in every setting mode, data will be set and return to RUN.
 *When enter into the parameter 2 group, the parameter name and data value will flicker by cycle(1sec.). Then to move the setting digit by ← key and change the setting value by ↓, ↑ key.
 *The fixed data value set by user in each parameter will flicker by cycle(1sec.) and move to the next parameter by pressing MD key.

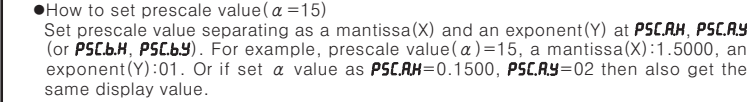
●Parameter 3 group

Menu and Parameter display	Parameter	Setting range	Setting key
<p>RUN MD Press for 5sec.</p> <p>Display PAR.A3 for 2sec. then move to F5-h automatically. Move to F5-h, if press MD key before 1sec.</p> <p>PAR.A3 → F5-h → F5-L → Addr → bPS → rEnot → LoL</p>	This is parameter 3 group.		
	Set the High-limit value of PV retransmission output.	●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter
	Set the Low-limit value of PV retransmission output.	●F3, F6 : 0 to Setting time range ●F8, F10 : -19999 to 99999	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter
	Set the communication Address.	00 to 99 (32 channel)	← : Move the setting digit ↓, ↑ : Change the setting value MD : Fix and move to the next parameter
	Select the communication speed.	2400 / 4800 / 9600	↓, ↑ : Change the setting mode MD : Fix and move to the next parameter
	Select the Remote and the Local. (★1)	on : Use off : Not use	↓, ↑ : Change the setting mode MD : Fix and move to the next parameter
	Enable to lock the key for each parameter group	off : There is no key lock in all mode LoL.0 : P0 - 3 Lock LoL.1 : P1 - 3 Lock LoL.2 : P2 - 3 Lock LoL.3 : P3 Lock only	↓, ↑ : Change the setting mode MD : Fix and move to the next parameter

*It will enter into parameter 3 if pressing MD key for 5sec. in RUN mode.
 (★1)It is enable to set the remote or local function in communication output type. When select the remote[rEnot] function, the front keys are disabled.
 (★2)Pressing MD key at parameter 3, it will enter into **F5-h** or **Addr** (option function). **LoL** (Indication type only).
 *If press MD key for over 2 sec. in every setting mode, data will be set and return to RUN.
 *When entering into the parameter 3 group, the parameter name and data value will flicker by cycle(1sec.). Then move the setting digit by ← key and change the setting value by ↓, ↑ key.
 *The fixed data value by user in each parameter will flicker by cycle(1sec.) and move to the next parameter by pressing MD key.

■ Function

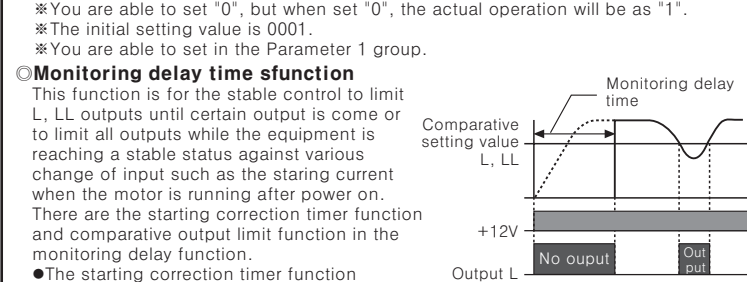
○Prescale function
 This prescale function allows you to multiply the number of pulse or pulse length by a variable(X * 10^Y) then display a specific unit or a certain double number.
 It will display frequency or RPM from prescale value(α) by measuring the input A frequency. For example, the prescale value when need to display the RPM as below.



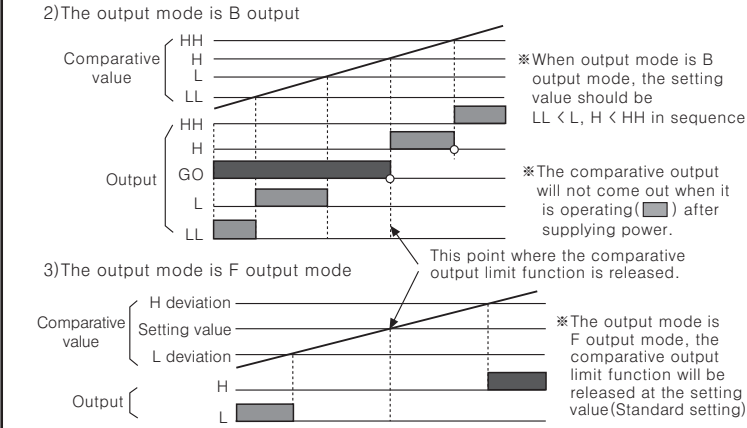
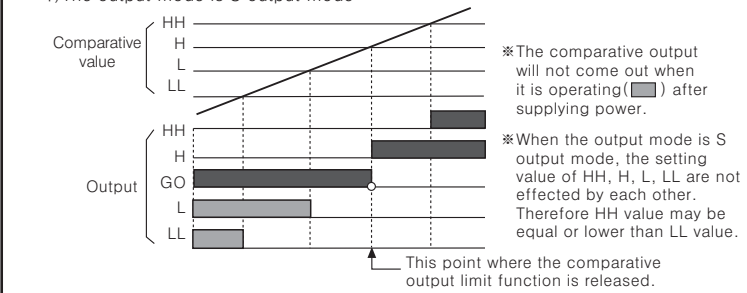
How to set prescale value(α=15)
 Set prescale value separating as a mantissa(X) and an exponent(Y) at **PSC.AH**, **PSC.AY** (or **PSC.bH**, **PSC.bY**). For example, prescale value(α)=15, a mantissa(X):1.5000, an exponent(Y):01. Or if set α value as **PSC.AH**=0.1500, **PSC.AY**=02 then also get the same display value.

○Monitoring function
 This function is to save High Peak value(h.PEV) or Low Peak value(L.PEV) against display value.
 ●User can check saved value in Parameter 0 group. And High Peak value(h.PEV) or Low Peak value(L.PEV) will be continuously saved during checking.
 ●See Parameter 0 for Reset.

○Hysteresis function
 Set the Hysteresis value(A) for comparative setting value in order to prevent unstable operation due to output going ON/OFF frequently.



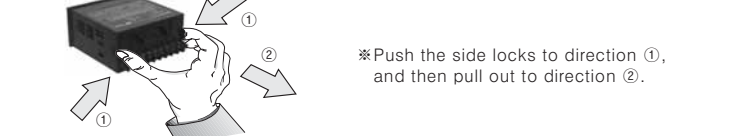
○Monitoring delay time function
 This function is for the stable control to limit L, LL outputs until certain output is come or to limit all outputs while the equipment is reaching a stable status against various change of input such as the starting current when the motor is running after power on. There are the starting correction timer function and comparative output limit function in the monitoring delay function.
 ●The starting correction timer function
 This function is to make the output not come out during the setting time. (Time setting range 0.0 to 99.9sec.)
 ●Comparative output limit function(LL, L output limit function)
 Applicable output mode: S,B,F mode(See "Output mode")
 This function is to limit the LL, L output before H or HH output.



○Auto-Zero time setting function
 When you know the interval of input signal, Auto-zero time should be set as a little bit longer than that interval of input signal. If there is no pulse input within setting time(Auto-zero time), it regards as the input signal is cut off then make the value as "00000" forcibly. Note that the Auto-zero time setting should be longer than the narrowest interval of input pulse. Otherwise it may be difficult to make the display value as "00000".
 ●Auto-zero time setting range(0.1 to 9999.9sec)
 ●When the display value is "00000", each output will respond to how it was programmed for "0".

○Lock setting function
 This function is to set the enable or disable of each Parameter and mode changes in MP5W.
 ●Off : No lock function
 ●LoC 0 : P0 to P3 Lock(Lock from Parameter 0 to Parameter 3)
 ●LoC 1 : P1 to P3 Lock(Lock from Parameter 1 to Parameter 3)
 ●LoC 2 : P2 to P3 Lock(Lock Parameter 2 to Parameter 3)
 ●LoC 3 : P3 Lock(Lock Parameter 3 only)

○Case detachment
 Please turn off the power before detaching the case.



○Inner hardware Lock setting function
 This function is to lock LoL in Parameter 3 group by Inner hardware Lock mode in order to prevent wrong setting.
 ●h0(Hardware Lock0) : Enable to check and change the LoL mode in parameter 3 group.
 ●h1(Hardware Lock1) : Enable to check the LoL mode only in parameter 3 group. But it is not possible to change the parameter.
 ●h2(Hardware Lock2) : Enable to check and change the LoL mode in parameter 3 group
 ●It is possible to lock or unlock after supplied power in Inner hardware Lock setting.

Display cycle selection function	Setting range
00000	0000 to 9999
0000.0	000.0 to 999.9
000.00	00.00 to 99.99
00.000	0.000 to 9.999
0.0000	0.000 to 0.9999

○Time unit selection function
 Enable to display PV value with firmed time unit in range of various time.
 ●Time unit selection function can be set in parameter 2 group.
 ●Applicable mode : Mode 3 to 6
 *There is no DOT setting mode when set the time unit display function.

SEC	MIN
999.99sec.	999.99min.
9999.9sec.	9999.9min.
99min.59.9sec.	99hour59.9min.
9hour59min.59sec.	999hour59min.
99999sec.	99999min.

○Data Bank switching function
 This function is to use the values by switching Data Bank 1, 2 after registering comparative setting value and prescale value into Data Bank1 and Data Bank2.
 ●When the 3 and 5 terminals are open circuited, the comparative value and prescale of Data Bank 1 will be used.
 ●When the 3 and 5 terminals are short-circuited, the comparative value and prescale of Data Bank 2 will be used.
 ●After selecting the Data Bank for saving the comparative setting value and prescale value, set the comparative setting value and prescale value then it will be saved at Data Bank.

○Factory default

Mode	Setting value	Parameter 3 group	Parameter 2 group	Parameter 1 group
F5-h	99999	PbAnL	1PStLL 00000	nodE F1hYS 0001
F5-L	00000	dot	00000 PSC. H 6.000	1n-AnPnhFGuArRdFdEFY
Addr	01	PSt.hh	99999 PSC. Y 10 01	out-t StArRdRuLoA 99999
bPS	9600	PSt. h	99999 di SPt 005	
rEnot	off	PSt. L	00000	
LoL	off			

*The specification may not be displayed due to the operation mode and output specification.

■ Caution for using

- Installation environment
 - ①It shall be used indoor
 - ②Altitude Max. 2000m
 - ③Pollution Degree 2
 - ④Installation Category II.
- Please use separated line from high voltage line or power line in order to avoid inductive noise.
- Please install power switch or circuit breaker in order to cut the power supply.
- The switch or circuit breaker should be installed near by users for safety.
- Do not use this unit at below places.
 - ①Place where there are severe vibration or impact.
 - ②Place where there are direct ray of the sun.
 - ③Place where strong magnetic field or electric noise are generated.
- Storage method
 When storing this unit for a long time, please avoid the direct ray of the sun and keep this unit under circumstances as -20 to +60°C, 35 to 85RH.
- Input line
 Shield wire must be used when the measuring input line is getting longer or there are lots of noises.
- Please put enough space between power line and terminal of measuring input.

*It may cause malfunction if above instructions are not followed.

■ Main products

■ COUNTER
 ■ TIMER
 ■ TEMPERATURE CONTROLLER
 ■ PANEL METER
 ■ TACHO/LINE SPEED/PULSE METER
 ■ DISPLAY UNIT
 ■ PROXIMITY SENSOR
 ■ PHOTOELECTRIC SENSOR
 ■ FIBER OPTIC SENSOR
 ■ PRESSURE SENSOR
 ■ ROTARY ENCODER
 ■ SENSOR CONTROLLER
 ■ POWER CONTROLLER
 ■ STEPPING MOTOR & DRIVER
 ■ CONTROLLER
 ■ LASER MARKING SYSTEM(CO₂, Nd:YAG)

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