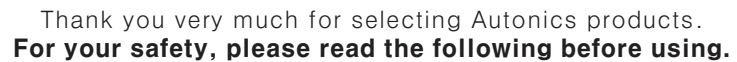


PULSE METER MP5W SERIES



※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.

- 1. 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.
- 2. It must be mounted on panel.**
It may give an electric shock.
- 3. Do not repair or check up when power on.**
It may give an electric shock.
- 4. 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.
- 5. Please check the number of terminal when connect power line or measuring input.**
It may cause a fire.

1. **This unit shall not be used outdoors.**
It might shorten the life cycle of the product or give an electric shock.
2. **When wire connection for power input and measuring input, the tightening strength for screw bolt on terminal block should be over than $0.74\text{N}\cdot\text{m} \sim 0.90\text{N}\cdot\text{m}$.**
It may result in malfunction or fire due to contact failure.
3. **Please observe specification rating.**
It might shorten the life cycle of the product and cause a fire.
4. **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.
5. **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.
6. **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.
7. **Do not inflow dust or wire dregs into inside of this unit.**
It may cause a fire or mechanical trouble.
8. **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

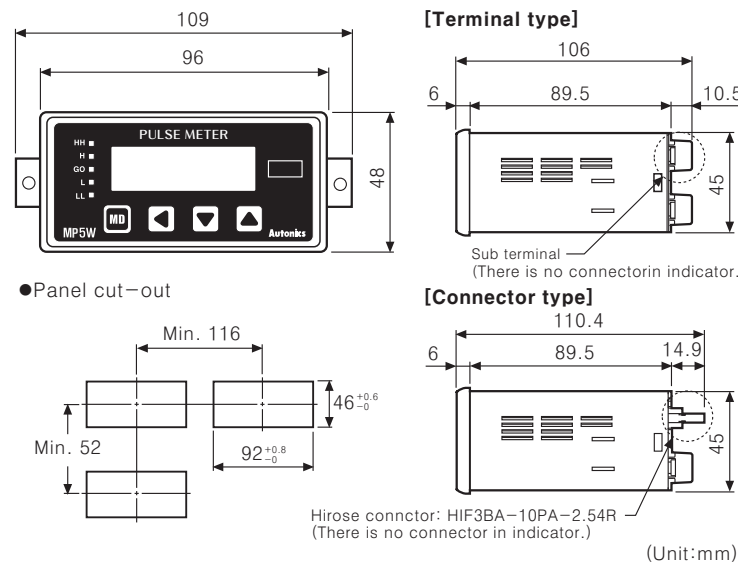
MP	5	W	-	4	N		Main output (Comparative value output)	Sub output (Display value output)
						N	Indicator	-
						A	Relay five-stage (HH, H, GO, L, LL)	-
						1	Relay three-stage (H, GO, L)	-
						2	NPN open collector quintuple output	BCD Dynamic
						3	PNP open collector quintuple output	BCD Dynamic
						4	NPN open collector quintuple output	PV transmission output (DC4-50mA)
						5	PNP open collector quintuple output	PV transmission output (DC4-50mA)
						6	NPN open collector quintuple output	Low speed serial output
						7	PNP open collector quintuple output	Low speed serial output
						8	NPN open collector quintuple output	RS485 communication
						9	PNP open collector quintuple output	RS485 communication
						4	100~240VAC 50/60Hz	
						W	DIN W96 × H48mm	
						5	99999(5 Digit)	
						MP	Pulse meter	

■ Specifications

Series		MP5W
Display method		7 Segment LED(Zero Blanking)
Character size		W7 × H14mm
Max. indication		5digit(−19999 to 99999)
Power supply		100–240VAC 50/60Hz
Allowable operation voltage		90 to 110% of rated voltage
Power consumption		Approx. Max. 6VA
Power for external sensor		12VDC ±10%, 80mA
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, [No–voltage input] Residual voltage:Max. 1V
Measuring range		• Mode F1, F2, F7, F8, F9, F10 : 0.0005Hz to 50kHz • Mode F3 : 0.02s to 3,200s • Mode F4, F5, F6 : 0.01s to 3,200s • Mode F11, F12, F13 : 0 to 4 × 10⁹ Count
Measuring accuracy (23 ±5℃)		• Mode F1, F2, F7, F8, F9, F10 : F.S. ±0.05% rdg ±1Digit • Mode F3, F4, F5, F6 : F.S. ±0.01% rdg ±1Digit
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 *1
Other functions		• Lock setting function • Auto–Zero time setting function • Current output range selection(Current output type only) • Comparative output function(HH, H, GO, L, LL) • Deviation memory function(F output mode applied only) • Peak value monitoring value • Remote/Local switching function(Communication output type only) • Data Bank switching function • Memory protection function(Mode F13 applied only) • Monitoring delay function • Time unit selection function
Main output	Triple/Quintuple relay	250VAC 3A resistive load 3a
	NPN open collector quintuple output	12–24VDC 30mA Max.
	PNP open collector quintuple output	
Sub output	BCD Dynamic	NPN open collector 12–24VDC 20mA Max.
	Low speed serial output	NPN open collector 12–24VDC 20mA Max.
	PV transmission	DC4–20mA Load 600Ω Max.(Response time : Max. 800ms)
	RS485 com.	32 channels, Mutral direction communication function
Memory		Non–volatile memory(Input times : 100,000 times)
Insulation resistance		Min. 100MΩ (at 500VDC megger) 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 operations
	Electrical	Min. 100,000 times at 250VAC 3A(resistive load)
Environment	Ambient temperature	−10 to 50℃, Storage temperature: −20 to 60℃
	Ambient humidity	35 to 85%RH, Storage humidity: 35 to 85%RH
Unit weight		Approx. 230g

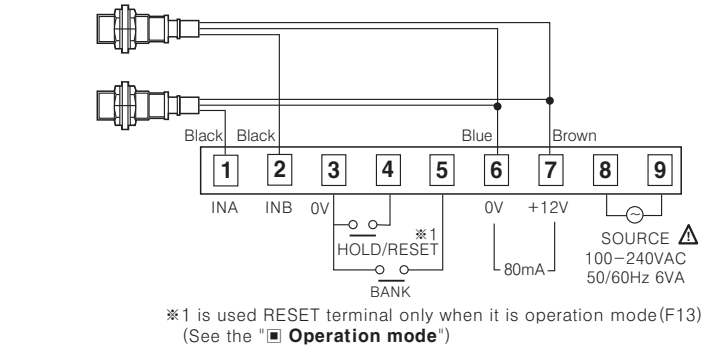
*Condition for use in environment is no freezing or condensation.
*1: The hysteresis setting range is changed by the setting position of decimal point.

■ Dimensions



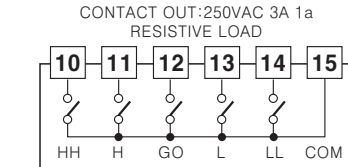
■ Connections

<Main terminal block>

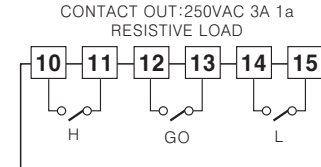


<Sub(Option) terminal block>

●RELAY(Five-stage) output
[MP5W-4A]

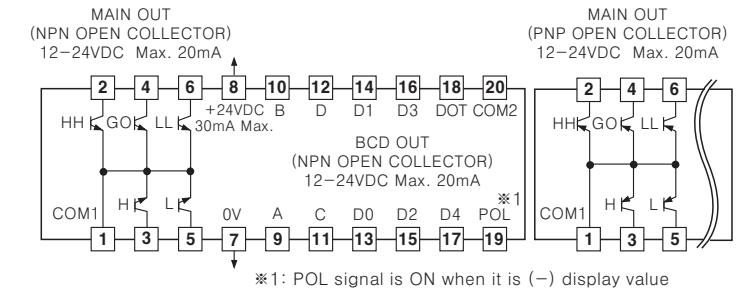


●RELAY(Three-stage) output
[MP5W-41]

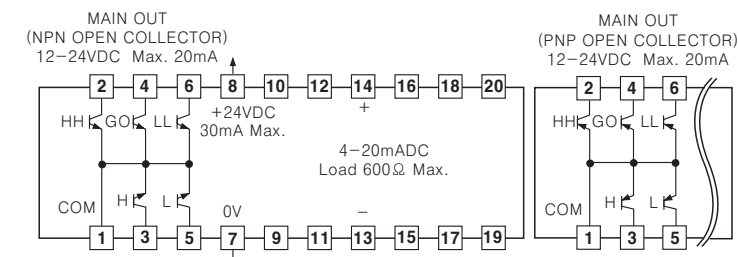


<Sub(Optional) output connector>

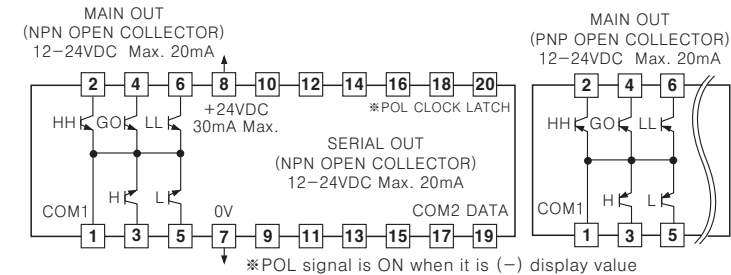
●NPN/PNP open collector output + BCD output [MP5W-42/MP5W-43]



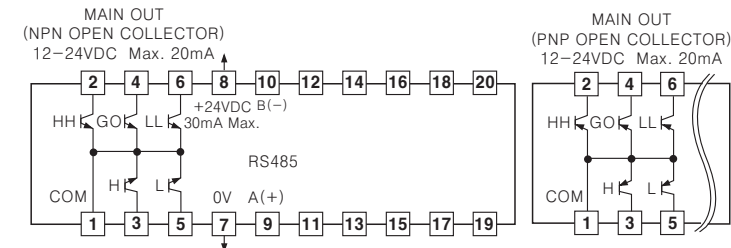
●NPN/PNP open collector output + PV transmission(4-20mA) output[MP5W-44/MP5W-45]



●NPN/PNP open collector output + Low speed serial output
[MP5W-46/MP5W-47]



●NPN /PNP open collector output + RS485 communication output
[MP5W-48/MP5W-49]

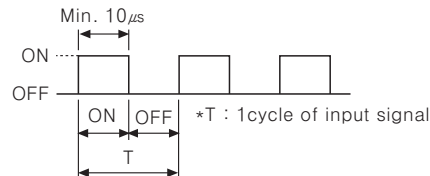


Input • Output

- **Input specification**

1. Input signal
 - (1) Solid state input
 - ① Input frequency: 50kHz(Max.)

But, standard duty rate of input signal is 1:1,
ON/OFF pulse width should be each over 10 μ s.
 - ② Input voltage Level : ON voltage $\rightarrow$ 4.5~24V, OFF voltage $\rightarrow$ 0~1.0V



- (2) Relay contact input
 ① Input frequency : 45Hz(Max.)
 But, ON/OFF pulse width should be each over 11ms.
 ② Relay contact specification : Please use a contact that can switch
 reliably at 12VDC, 2mA min. of load current

2. Input type
MP5W has **NPN input and PNP input** and it is able to select it in Parameter 1 group.

- (1) NPN input type
- ① Contact ② NPN voltage output type sensor ③ NPN O · C output type sensor
-
- The diagrams illustrate three NPN input types:
- ① Contact: A simple switch contact connected to the sensor input.
 - ② NPN voltage output type sensor: A sensor circuit connected to a +12V supply and ground. The output is connected to a main circuit.
 - ③ NPN O · C output type sensor: A sensor circuit connected to a +12V supply and ground. The output is connected to a main circuit through a 4.5kΩ resistor.

- (2) PNP input type
- ① Contact ② PNP voltage output type sensor ③ PNP O · C output type sensor
-
- ※ O · C is Open collector output

- Output specification

1. Relay output
 - ①Output : Comparative or alarm output(See the "■ **Output mode**")
 - ②Output method : Relay
 - ③Contact capacity : 250VAC 3A resistive load
 - ④Life cycle : Mechanical—20million times(Switch times 180 times/min.)
Electrical—Min.100,000 times(3A 250VAC at resistive load)
(Switch times : 20 times/min.)
2. TR output
 - ①Output : Comparative or alarm output(See the "■ **Output mode**")
 - ②Output method : NPN / PNP Open collector
 - ③Rated load voltage : 12—24VDC
 - ④Max. load current : 20mA

●Mode F13(Integration)

It displays the counting value against pulses of Input A.
Integration = $P \times \alpha$

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

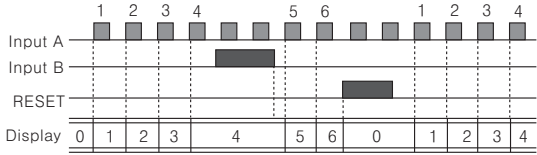
●Display value and display unit

Display value	Display unit
Integration	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.



■ Output mode

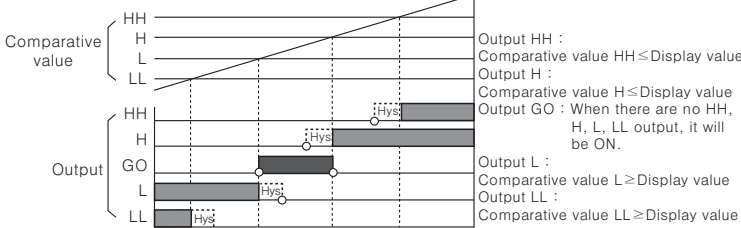
●Select output mode in **out-t**(output type) of Parameter1 group.

●There are 5 stages output(HH, H, GO, L, LL) and 3 stage output(H, GO, L).

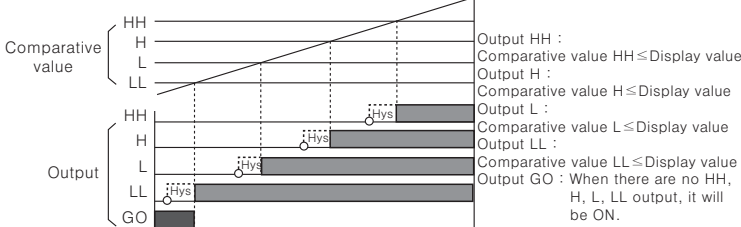
●There are 6 kinds of output mode such as S(Standard) output mode, H(High) output mode, L(Low) output mode, B(Block) output mode, I(One shot)output mode, F(Deviation)output mode.

●Comparative value(HH, H, L, LL) can be set as LL<L<H<HH in B output mode and the other outputs can be operated separately in output(S,H, L, I) mode regardless of comparative (HH, H, L, LL) set value

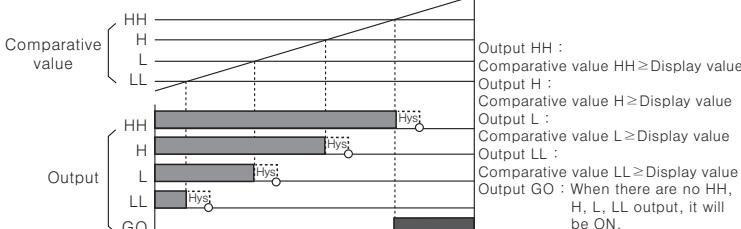
○ S(Standard) output mode[StAr.d]



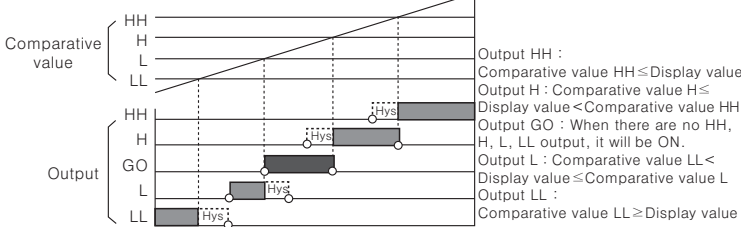
○ H(High) output mode[out-h]



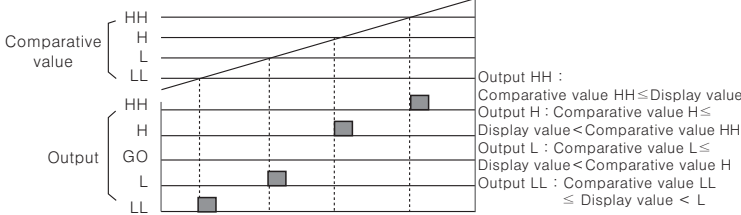
○ L(Low) output mode[out-L]



○ 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([MD]+[▲]) key in front.

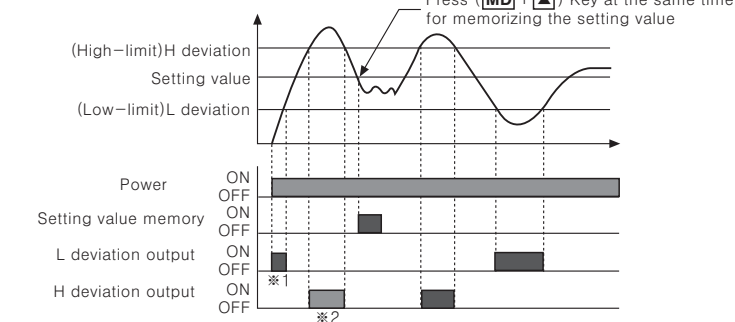
●Display the setting value : Check the memorized the setting value by ([▲]) key. (Display the memorized setting value for pressing [▲] key continuously.)

●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



*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 thought 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		●	●	●	●	●	●	●	●	●	●	●	●	●
hPEV		●	●	●	●	●	●	●	●	●	●	●	●	X
LPEV		●	●	●	●	●	●	●	●	●	●	●	●	X

●Parameter 1 group

Parameter 1	Sub mode	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
nodE		●	●	●	●	●	●	●	●	●	●	●	●	●
I n-A		●	●	●	●	●	●	●	●	●	●	●	●	●
I n-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
NE.no		X	X	X	X	X	X	X	X	X	X	X	X	●

*"●" : 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
PbAnE		●	●	●	●	●	●	●	●	●	●	●	●	●
dat		●	●	X	X	X	X	●	●	●	●	●	●	●
twnt		X	X	●	●	●	●	X	X	X	X	X	X	X
PSt.hh		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.h		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.L		●	●	●	●	●	●	●	●	●	●	●	●	●
PSt.LL		●	●	●	●	●	●	●	●	●	●	●	●	●
PSCAH*1		●	X	●	X	X	X	●	●	●	●	●	●	●
PSCAY*1		●	●	X	●	X	X	●	●	●	●	●	●	●
PSCbH		X	X	X	X	X	X	●	●	●	●	X	X	X
PSCbY		X	X	X	X	X	X	●	●	●	●	X	X	X
dI SPt		●	X	X	X	X	X	●	●	●	●	X	X	X

*1: PSC. H, 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
F5-h														
F5-L														
Addr														
bPS														
rENob														
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
RUN → [MD] Touch → PSt.hh → [MD] → PSt.h → [MD] → PSt.L → [MD] → PSt.LL → [MD] → h.PEV → [MD] → L.PEV → [MD]	Set HH comparative value		
	Set H comparative value	●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999	◀ : Move the setting digit ▼, ▲ : Change the setting value
	Set L comparative value	●F3 to F6 : 0 to Setting time range	
	Set LL comparative value	●F8, F10 : -19999 to 99999	◻ [MD] : Fix and move to the next parameter
	Display high peak value among measuring values		●Reset If you press ◻ key for 2sec. while h.PEV or L.PEV is flickering, the Peak value display will be reset to the current measuring value and it will keep flickering.
	Display low peak value among measuring values		◻ [MD] If you touch once again, it will return to L.PEV or RUN.

*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.PEV 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
RUN → [MD] press 3sec. → PAR.1 → [MD] → nodE → [MD] → I n-A → [MD] → I n-b → [MD] → out-t → [MD] → hys → [MD] → GuAr.d → [MD] → Auto.A → [MD] → Auto.b → [MD] → NE.no → [MD]	This is parameter 1 group.		
	Select operation mode.	F1 to F13	▼, ▲ : Change the setting mode → F1 → F2 to F13 ◻ [MD] : Fix and move to the next parameter
	Set the sensor type of input A.	• PNP transistor output type : PnP.h.F • Contact output type(L output) : PnP.L.F • NPN transistor output type : nPn.h.F • Contact output type(H output) : nPn.L.F	▼, ▲ : Change the sensor type ◻ [MD] : Fix and move to the next parameter
	Select the output mode. *1	StAr.d / out-h / out-L out-b / out-I / out-F	▼, ▲ : Change the setting mode → StAr.d → out-h → out-L out-F ← out-I ← out-b ◻ [MD] : Fix and move to the next parameter
	Set the hysteresis for the output. *2	0 to 9999 (If decimal point is set in 0000.0, the range will be 0 to 9999.)	◻ : Move the setting digit ▼, ▲ : Change the setting value ◻ [MD] : Fix and move to the next parameter
	Select the start compensating timer function or comparative output(L, LL) limit function. *3	① F.dEFY / StAr.t ② When select StAr.t When [StAr.t 999] is flickering by 1sec. cycle, set the starting correction time 0.0 to 999.	① ▼, ▲ : Change the setting mode → F.dEFY → StAr.t ◻ [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
	Set the Auto-zero time of INA input.	0.1 to 9999.9	◻ : Move the setting digit ▼, ▲ : Change the setting value ◻ [MD] : Fix and move to the next parameter
	Set the Auto-zero of INB input.	0.1 to 9999.9	◻ : Move the setting digit ▼, ▲ : Change the setting value ◻ [MD] : Fix and move to the next parameter
	It sets the memory retention. The measuring value will be memorized when the power off. (Mode F13 only)	on : Memory retention off : No memory retention	▼, ▲ : Change the setting mode → on → off ◻ [MD] : Fix and move to the next parameter nodE.

*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 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.

