

Autonics

PULSE METER MP5Y 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

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.

Caution

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 0.74N · m ~ 0.90N · 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. 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.

5. 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.

6. Do not inflow dust or wire dregs into inside of this unit.

It may cause a fire or mechanical trouble.

7. 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

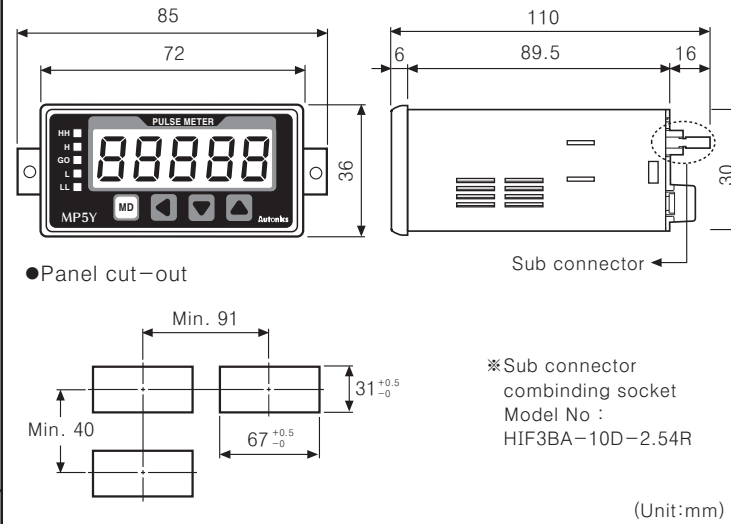
① Series	MP	Pulse meter	
② Digit	5	5digit(99999)	
③ Size	Y	DIN Size W72 × H36mm	
④ Power supply	4	100-240VAC 50/60Hz	
⑤ Output (Main Output + Sub output)	N	Indication type only	X
	1	NPN open collector five-stage output	X
	2	PNP open collector five-stage output	X
	3	X	BCD Dynamic
	4	X	PV Retransmission(4-20mADC)
5	X	RS485 communication	

※PNP open collector output:Option

Specifications

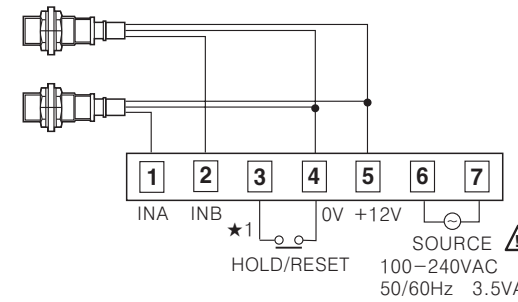
Model	MP5Y	
Power supply	100-240VAC 50/60Hz	
Allowable operation voltage	90 to 110% of rated voltage	
Power consumption	Approx. 3.5VA(240VAC)	
Power for external sensor	12VDC ±10%, 80mA	
Measuring accuracy (23 ±5°C)	• Mode F1, F4, F7, F8, F9, F10 : F.S. ±0.05% rdg ±1Digit • Mode F2, F3, F5, F6 : F.S. ±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 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 Size : 6.8 × 13.8	
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) • 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	• Transistor output(NPN/PNP open collector) : Comparative output, Alarm output • BCD Dynamic output : Display value output • PV transmission 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
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. 135g	

Dimensions



Connections

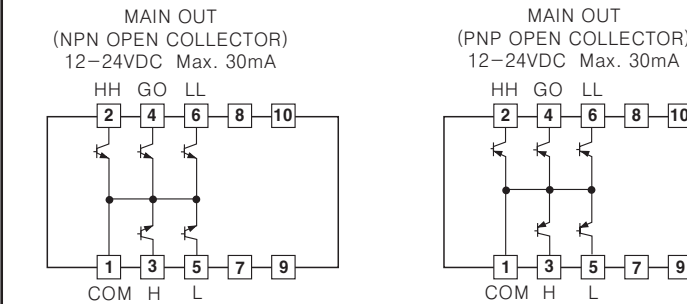
Main terminal block



※(★1) is used RESET terminal only when it is operation mode(F13) (See the "Operation mode")

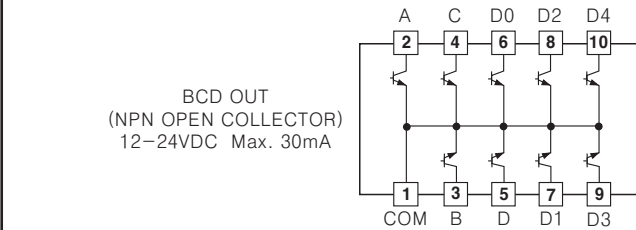
Main output(Comparative output) connector

NPN/PNP Open Collector output[MP5Y-41/MP5Y-42]

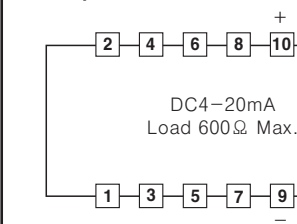


Sub output(Display value output) connector

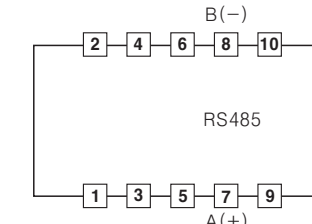
BCD output[MP5Y-43]



PV retransmission(DC4-20mA) output[MP5Y-44]



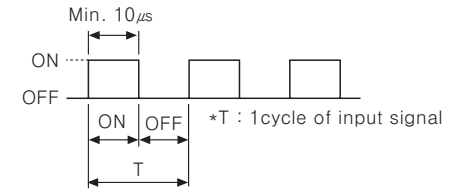
RS485 communication output [MP5Y-45]



Input · Output

Input specification

- Input signal
 - Solid state input
 - Input frequency : 50kHz(Max.)
But, standard duty rate of input signal is 1:1, ON/OFF pulse width should be each over 10μs.
 - Input voltage Level : ON voltage → 4.5-24V, OFF voltage → 0-1.0V

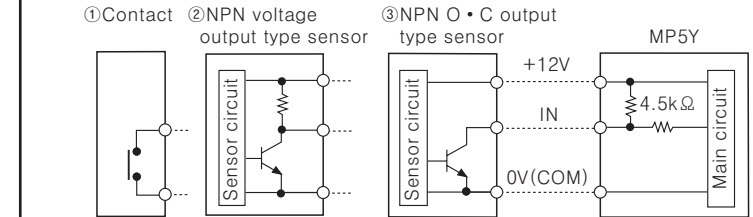


- Relay contact input
 - Input frequency : 45Hz(Max.)
But, ON/OFF pulse width should be each over 11ms.
 - Relay contact specification : Please use a contact that can switch reliably at 12VDC, 2mA min. of load current.

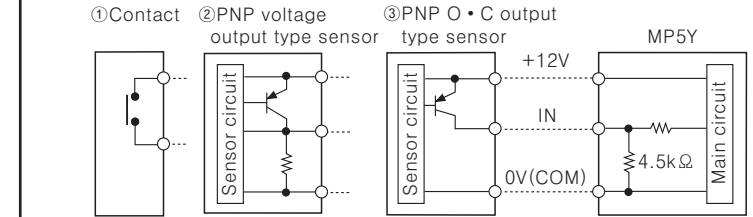
- Input type

MP5Y has NPN input and PNP input and it is able to select it in Parameter 1 group.

(1)NPN input type



(2)PNP input type



※O · C is Open collector output

Output specification

- TR output
 - Output : Comparative or alarm output(See the "Output mode")
 - Output method : NPN / PNP Open collector
 - Rated load voltage : 12-24VDC
 - Max. load current : 30mA

2. BCD Dynamic output

- Output : Display value
- Output 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

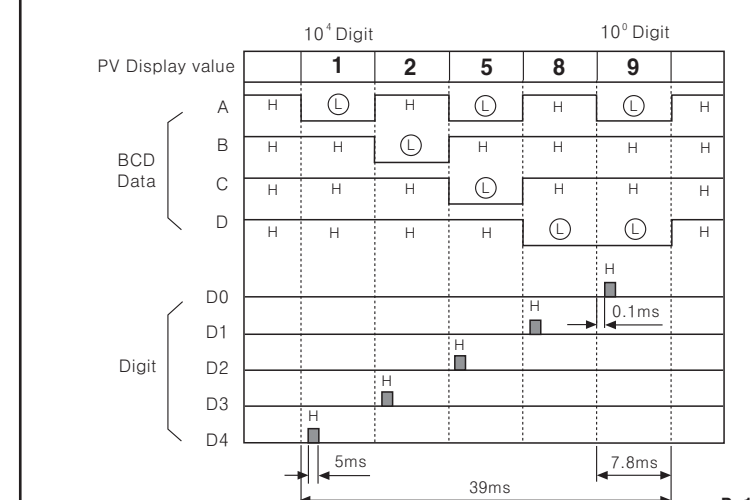
※There is no DOT Data output, please put decimal point in external.

③Output type : NPN Open Collector

④Rated load voltage : 12-24VDC

⑤Max. load current : 30mA

Ex) When display value is 12589



Parameter 2 group

Menu and Parameter display	Parameter	Setting range	Setting key												
PR-A.2 After displaying PR-A.2 for 2sec. then advance to PbAnE automatically. Pressing MD key before 1sec. it will move to PbAnE.	This is parameter 2 group.														
dot Set decimal point position of display value		00000 00000 0000.0 0000.0 0000.00 0000.00	◀ : Move the decimal point MD : Fix and move to the next parameter												
t.unT It will be displayed in F3, F4, F5, F6 operation mode and set the time unit. (★1) ① Select the time unit ② Select time range		<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 → t.SEC → t.nIn ② ▼, ▲ : Change the setting value 9999.99 → 9999.9 → 99.59.9 99999 → 99.59.9 (sec.) 99999 → 99.59.9 (min.) 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.														
PSt.hh Set the comparative value HH.		99999	◀ : Move the setting digit												
PSt.h Set the comparative value H.	●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999	99999	▼, ▲ : Change the setting value												
PSt.L Set the comparative value L.	●F3 ~ F6 : 0 to Setting time range	00000	MD : Fix and move to the next parameter												
PSt.LL Set the comparative value LL.	●F8, F10 : -19999 TO 99999	00000													
PSC.AH Set the prescale value of input A mantissa(X).		00000 to 99999	◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter												
PSC.AY 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												
PSC.bH Set the prescale value of input B mantissa(X).		00000 to 99999	◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter												
PSC.bY 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												
dI SP.t Select the display cycle.		0.05, 0.5, 1, 2, 4, 8	▼, ▲ : Change setting value 0.05 → 0.5 → 1 8 ← 4 ← 2 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 able to select second [t.SEC] or minute [t.nIn] in time until selection parameter [t.unT]. then also selectable time range.

*When enter into the parameter 2 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 set by user in each parameter will flicker by cycle(1sec.) and move to the next parameter by pressing MD key.

*If press MD key for over 2 sec. in every setting mode, data will be set and return to RUN.

* [- - -] parameter is not shown in MP5Y-4N, MP5Y-43, MP5Y-44, MP5Y-45.

Parameter 3 group

Menu and Parameter display	Parameter	Setting range	Setting key
PR-A.3 Display PR-A.3 for 2sec. then move to FS-h automatically. Move to FS-h, if press MD key 1sec. before.	This is parameter 3 group.		
FS-h Set the High-limit value of PV transmission output.	●F1, F2, F7, F9, F11, F12, F13 : 0 to 99999 ●F3, F6 : 0 to Setting time range ●F8, F10 : -19999 to 99999	99999	◀ : Move the setting digit ▼, ▲ : Change the setting value MD : Fix and move to the next parameter
FS-L Set the Low-limit value of PV transmission output.		00000	
Addr 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
bPS Select the communication speed.		2400 / 4800 / 9600	▼, ▲ : Change the setting value 2400 → 4800 → 9600 MD : Fix and move to the next parameter
rEnot Select the Remote and the Local. (★1)	on : Use off : Not use	off	▼, ▲ : Change the setting mode off → on MD : Fix and move to the next parameter
LoC Enable to lock the key for each parameter group	off : There is no key lock in all mode LoC.0 : P0 to 3 Lock LoC.1 : P1 to 3 Lock LoC.2 : P2 to 3 Lock LoC.3 : P3 Lock only	off	▼, ▲ : Change the setting mode off → LoC.0 → LoC.1 LoC.3 ← LoC.2 MD : Fix and move to the next FS-h.

*It will enter into parameter 3 if pressing MD key for 5sec in RUN mode.

* (★1) It is able 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 FS-h or Addr (option function), LoC (indication type only).

*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.

*If press MD key for over 2 sec. in every setting mode, data will be set and return to RUN mode then if no key is touched for 60sec. data will be held as previous value and return to RUN mode.

Function

Prescale function



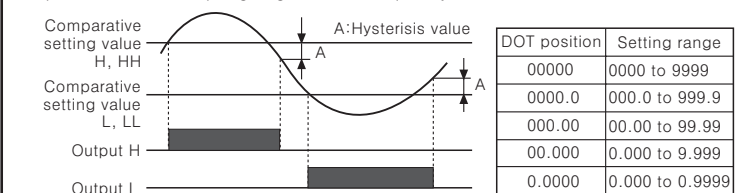
● Prescale value (α = 15) setting
Set prescale value (α) as mentissa(X) and exponent(y) at PSC.AH, PSC.AY (PSC.bH, PSC.bY) of parameter 2 group.
Prescale value (α) = 15 → Mentissa(X):1.5000, Exponent(y):10¹
And also it is able to set α value as X=0.1500, Y=10¹ then get the same display value.
* Display cycle can be selected at parameter 2 group.

Display Peak value monitoring function

This is to monitor max. value and min. value by current display value, and display that Data at hPEV/LPEV mode of parameter 0 group.
● User can check saved value in parameter 0 group. And High Peak (hPEV) value or Low Peak (LPEV) will be continuously saved during checking.
● See Parameter 0 for Reset.

Hysteresis function

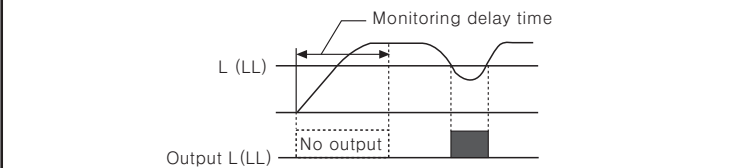
Set the Hysteresis value(A) for comparative setting value in order to prevent unstable operation due to output going ON/OFF frequently.



* You are able to set "0", but when set "0", the actual operation will be as "1".
* The initial setting value is 0001.
* You are able to set in the Parameter 1 group.

Monitoring delay time function

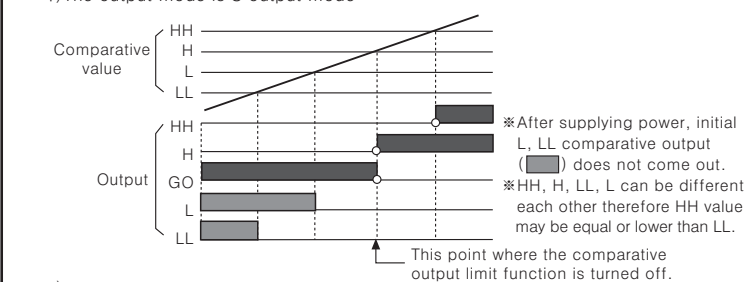
This function is for the stable control to limit LLL outputs until certain output is come or to limit all outputs during the equipment is reaching a stable status against various change of input such as the starting current when the motor is running after power on. There are no the starting correction timer function and comparative output limit function in the monitoring delay function. (Select in GuAr.d mode of parameter 1 group)
● The starting correction timer function (Parameter 1 group StAr.t mode)
This function is to make the output not come out during the setting time.
(Time setting range 0.0 to 99.9sec)



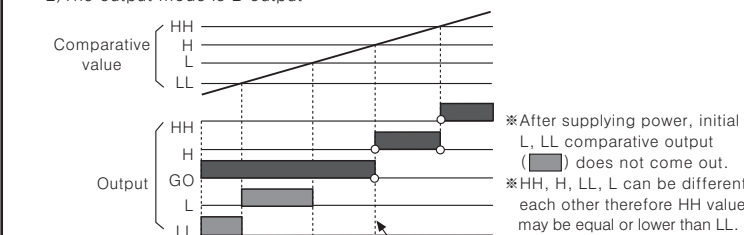
Comparative output limit function (Parameter 1 group FdEFY mode)

Applicable output mode: S, B, F output mode
This function is to limit the LL, L output before H or HH output.

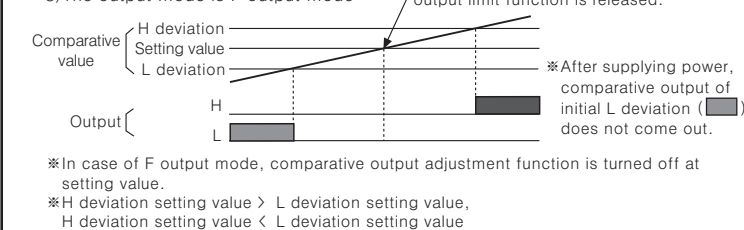
1) The output mode is S output mode



2) The output mode is B output



3) The output mode is F output mode



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 be come against "0".
- Auto-zero time setting is available in parameter 1 group.

Lock setting function

This function is to set the enable or disable of each Parameter and mode changes in MP5Y.

- 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 from Parameter 2 to Parameter 3)
- LoC 3 : P3 Lock (Lock Parameter 3 only)
- Lock setting is available in parameter 3 group.

Inner hardware Lock setting function

This function is to lock LoC in Parameter 3 group by Inner hardware Lock mode in order to prevent wrong setting.

- h0 (Hardware Lock0) : Enable to check and change the LoC mode in parameter 3 group.
- h1 (Hardware Lock1) : Enable to check the LoC mode only in parameter 3 group. But it is not possible to change the parameter.
- h2 (Hardware Lock2) : Enable to check and change the LoC mode in parameter 3 group
- It is possible to lock or unlock after supplied power in Inner hardware Lock setting.

* Setting pin for Lock setting is located on internal PCB.

h0 mode (Factory specification) h1 mode h2 mode

Display cycle selection function

This function is to change the display cycle in range of 0.05/0.5/1/2/4/8 sec., and displays the average value of measuring value for the setting cycle.

Time unit selection function

Enable to display PV value with firm time unit in range of various time.
● Time unit selection function can be set in parameter 2 group.

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

* There is no DOT setting mode when set the time unit display function.

Factory default

Parameter 3 group		Parameter 2 group		Parameter 1 group	
Mode	Setting value	Mode	Setting value	Mode	Setting value
FS-h	99999	dot	00000	PSt.LL	00000
FS-L	00000	PSt.hh	99999	PSC.H	6.0000
Addr	00	PSt.L	99999	PSC.Y	10 0 1
bPS	2400	PSt.LL	00000	dI SP.t	005
rEnot	off				
LoC	off				

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

Caution for using

- Installation environment
 - If shall be used indoor
 - Altitude Max. 2000m
 - Pollution Degree 2
 - Installation 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.
 - Place where there are severe vibration or impact.
 - Place where there are direct ray of the sun.
 - Place 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.
 - Using shield with two wires
- 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

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