Autonics

PULSE METER
MP5M SERIES
INSTRUCTION MANUAL

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.

⚠**Warning** Failure to follow these instructions may result in serious injury or death.

⚠**Caution** Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
   Failure to follow this instruction may result in personal injury, fire, or economic loss.
2. **The unit must be installed on a device panel before use.**
   Failure to follow this instruction may result in electric shock.
3. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in electric shock.
4. **Do not disassemble or modify the unit. Please contact us if necessary.**
   Failure to follow this instruction may result in electric shock or fire.
5. **Check the terminal numbers before connecting the power source and measurement input.**
   Failure to follow this instruction may result in fire.

⚠ Caution

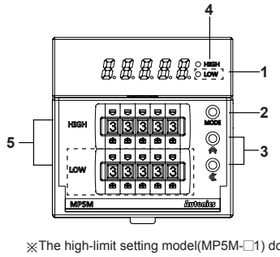
1. **Do not use the unit outdoors.**
   Failure to follow this instruction may result in electric shock or shortening the life cycle of the unit.
2. **When connecting the power input or measuring input, make sure to tighten the terminal screw bolt above 0.74N•m to 0.90N•m.**
   Contact failure may result in fire.
3. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in electric shock or shortening the life cycle of the unit.
4. **Do not use loads beyond the rated switching capacity of the relay contact.**
   Failure to follow this instruction may result in insulation failure, contact failure, contact bonding, relay damage, or fire.
5. **Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**
   Failure to follow these instructions may result in electric shock or fire.
6. **Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, and impact may be present.**
   Failure to follow this instruction may result in fire or explosion.
7. **Keep dust and wire residue from flowing into the unit.**
   Failure may result in fire or product malfunction.
8. **Check the polarity of the measurement input contact before wiring the unit.**
   Failure to follow this instruction may result in fire or explosion.

■ Ordering Information

MP 5 M - 4 N

Output		Main output (Comparative value output)
	N	Indicator
	1	Relay single (high-limit) output+ NPN open collector output
	2	Relay dual (high/low-limit) output+ NPN open collector output
Power supply	**2**	24VAC 50/60Hz, 24-48VDC
	4	100-240VAC 50/60Hz
Size	**M**	DIN W72×H72mm
Digit	**5**	99999 (5 Digit)
Item	**MP**	PULSE METER

■ Product Description



1: Display
Displays current value in RUN mode.
Alternately displays setting parameters and corresponding value in SETTING mode.

2: MODE key
In RUN mode, press the key once to check max./min. value.
In RUN mode, hold the key for over 2 sec. to enter parameter groups.

3: ﹤, ﹥, ∧ key
Select parameter groups, and select or setting values in the corresponding parameters.

4: Output status indicator

5: Thumbwheel switch for HIGH/LOW setting value

※The high-limit setting model(MP5M-□1) does not include the dotted line parts.

※The above specifications are subject to change and some models may be discontinued without notice.

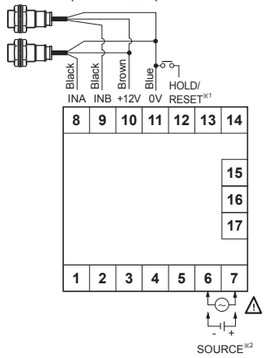
■ Specifications

Model		MP5M-2N	MP5M-4N	MP5M-21	MP5M-41	MP5M-22	MP5M-42
		Indicator		High-limit setting		High/Low-limit setting	
Display method		7 Segment LED (zero blanking method)					
Character size		W4×H8mm					
Display range		0.0001 to 99999					
Power supply	AC voltage	100-240VAC 50/60Hz					
	AC/DC voltage	24VAC 50/60Hz, 24-48VDC					
Power consumption	AC voltage	Max. 9.0VA (100-240VAC 50/60Hz)					
	AC/DC voltage	Max. 6.5VA (24VAC 50/60Hz), Max. 5.0W (24-48VDC)					
Permissible voltage range		90 to 110% of rated voltage					
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 method		[Voltage Input method] High: 4.5-24VDC, Low: 0-1.0VDC, input impedance: 2.4kΩ [No-voltage Input method] Short-circuit impedance: Max. 80Ω, Residual voltage: Max. 1V, Open-circuit impedance: Min. 100kΩ					
Measurement range		·Mode F1, F2, F7, F8 : 0.0005Hz to 50kHz ·Mode F3, F4, F5, F6 : 0.01 to Max. of each time range ·Mode F9, F10, F11, F14 : 0 to 99999 ·Mode F12, F13 : -19999 to 99999					
Measurement accuracy(23 ±5℃)		·Mode F1, F2, F7, F8: F.S.±0.05% rdg±1 Digit ·Mode F3, F4, F5, F6: F.S.±0.01% rdg±1 Digit					
Display cycle		OFF(for F2, F14 mode), 0.05, 0.5, 1, 2, 4, 8 sec.(same as update output cycle)					
Operation mode		Frequency/Revolutions/Speed (F1), Passing speed (F2), Cycle (F3), Passing time (F4), Time interval (F5), Time differential (F6), Absolute ratio (F7), Density (F8), Length measurement 1 (F9), Interval (F10), Accumulation (F11), Addition/Subtraction-individual input (F12), Addition/Subtraction-phase difference input (F13), Length measurement 2 (F14)					
Prescale function		Direct input method (0.0001×10^{-9} to 9.9999×10^{9})					
Hysteresis		—		0 to 9999※1			
Main output	Relay single	—		250VAC 3A resistive load 1c		—	
	Relay dual			—		250VAC 3A resistive load 1a	
	NPN open collector quintuple			Max. 30VDC 100mA			
Memory retention		Non-volatile memory (number of inputs: Min. 100,000 operations)					
Insulation resistance		Min. 100MΩ (at 500VDC megger)					
Dielectric strength		2,000VAC 60Hz for 1 min.					
Noise resistance		Square-wave noise by noise simulator (pulse width 1μs) ±2kV					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hours					
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes					
Shock	Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times					
	Malfunction	100m/s² (approx. 30G) in each X, Y, Z direction for 3 times					
Relay life cycle	Mechanical	—		Min. 10,000,000 operations			
	Electrical	—		Min. 100,000 operations (250VAC 3A resistive load)			
Environment	Ambient temp.	-10 to 50℃, storage: -20 to 60℃					
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH					
Approval		CE cULus					
Weight※2		Approx. 243g (approx. 168g)		Approx. 256g (approx. 181g)		Approx. 265g (approx. 190g)	

※1: Setting range will vary depending on the decimal point.
※2: The weight includes packaging. The weight in parentheses is for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Connections

● Indicator(MP5M-□N)

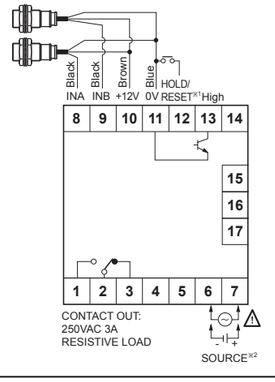


※1: Operation mode F1 to F10:
Display value HOLD
Operation mode F11 to F14:
Display value RESET

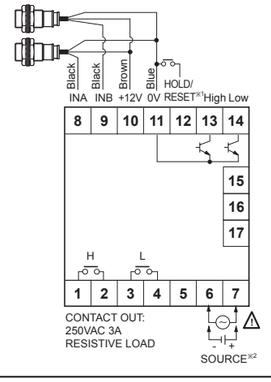
※2:

Model	Source
MP5M-21	24VAC 50/60Hz 24-48VDC
MP5M-22	
MP5M-2N	
MP5M-41	100-240VAC 50/60Hz
MP5M-42	
MP5M-4N	

● High-limit setting(MP5M-□1)

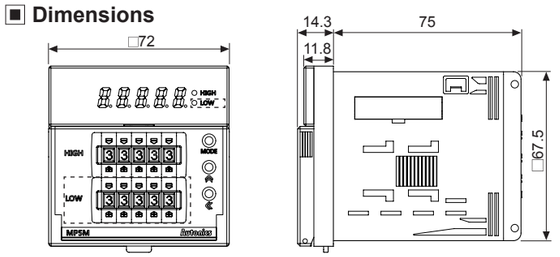


● High/Low-limit setting(MP5M-□2)



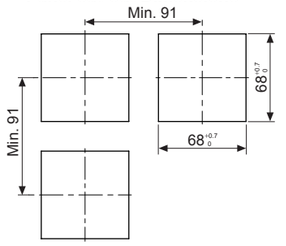
■ Dimensions

(unit: mm)

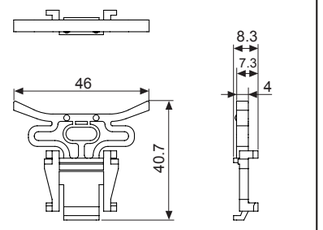


※The high-limit setting model(MP5M-□1) does not include the dotted line parts.

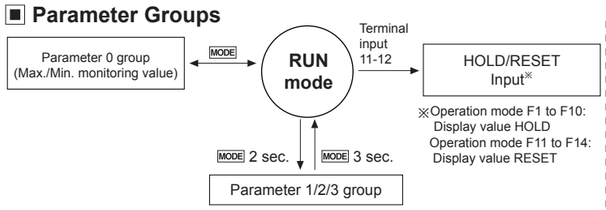
● Panel cut-out Dimensions



● Bracket

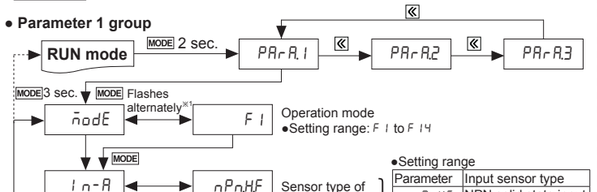


■ Parameter Groups

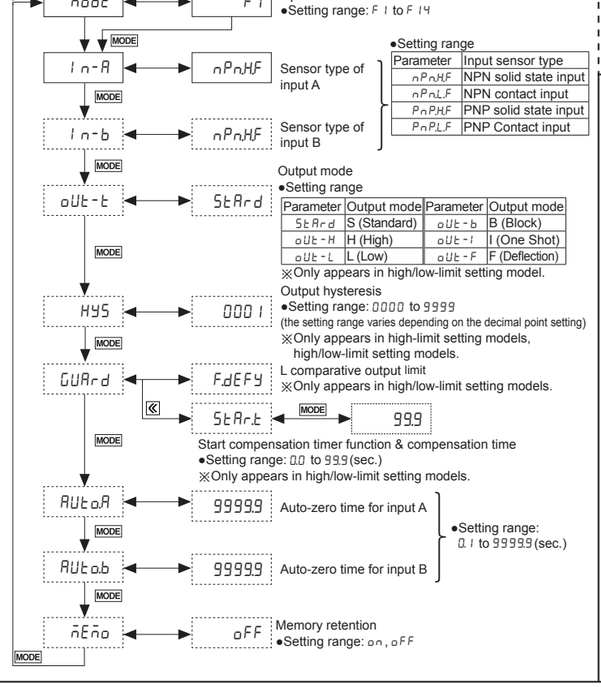


※Press the ﹤, ∧, ∨ keys to select or set the desired value.
※Press the MODE key once after changing the setting value, to save the setting value and move to the next parameter.
※Hold the MODE key for 1.5 sec. at any parameters to return to the select parameter group mode.
※Hold the MODE key for 3 sec. to save the setting value and return to RUN mode after changing the setting value.
※If there is no key input for 60 sec. while setting the parameters, the new settings are ignored, and the unit will return to RUN mode with previous settings.
※The dotted line parameters may not appear depending on output specifications or other parameter settings. Please refer to '■ Operation mode by parameter group'.
※1: Each parameter and corresponding setting value will flash alternately every 0.5 sec.

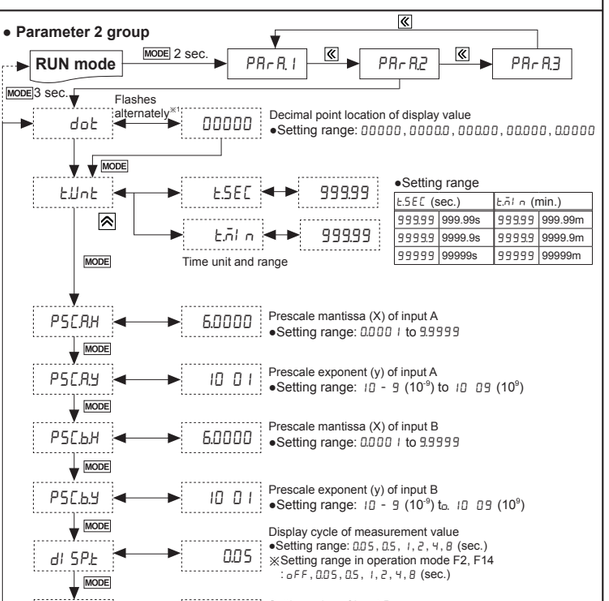
● Parameter 0 group



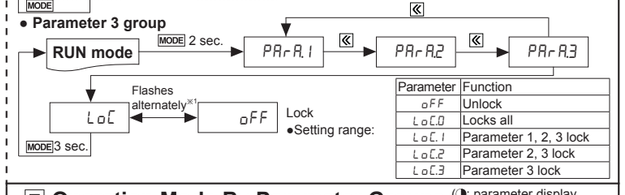
● Parameter 1 group



● Parameter 2 group



● Parameter 3 group



■ Operation Mode By Parameter Groups

(◑: parameter display, X: no parameter display)

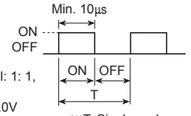
Parameter \ Operation mode		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
0 group	HPEY	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	X	◐	◐	X
	LPEY	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	X	◐	◐	X
1 group	nodE	Appears in all operation modes(F1 to F14).													
	In-A														
	In-b※1	X	◐	X	X	X	◐	◐	◐	◎※3	◎	◎	◐	X※4	◐※5
	oUt-t※2	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	X	◐	◐	•
	HYS※1	◐	X	X	X	X	X	◐	◐	X	X	X	X	X	X
	GUArd	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	X	X	X	X
	AUtoA	◐	X	◐	X	X	◐	◐	◐	X	X	X	X	X	X
	AUtob	X	X	X	X	X	X	◐	◐	X	X	X	X	X	X
	nEno	X	X	◐	X	X	X	X	X	X	X	◐	◐	◐	◐
2 group	dot	◐	◐	X	X	X	X	◐	◐	◐	◐	◐	◐	◐	◐
	tUnt	X	X	◐	◐	◐	◐	X	X	X	X	X	X	X	X
	PSCAH	◐	◐	X	◐	X	X	◐	◐	◐	◐	◐	◐	◐	◐
	PSCAY	◐	◐	X	X	X	X	◐	◐	◐	◐	◐	◐	◐	◐
	PSCbH	X	X	X	X	X	X	◐	◐	X	X	X	X	X	X
	PSCbY	X	X	X	X	X	X	◐	◐	X	X	X	X	X	X
	di SPt	◐	▣※6	X	X	X	X	◐	◐	X	X	X	X	X	▣
	CoUnb	X	X	X	X	X	X	X	X	X	X	X	X	X	◐
3 group	LoC	Appears in all operation modes(F1 to F14).													

※1: Only appears in high/low-limit setting models.
※2: Only appears in high-limit setting models, high/low-limit setting models.
※3: (◎) Only nPnHF or PnPHF setting are available for Input B sensor.
※4: The settings for In-b and In-A are applied.
※5: (●) F output mode[oUt-F] cannot be set.
※6: (▣) setting range: oFF, 0.05, 0.5, 1, 2, 4, 8

● Monitoring delay function by output mode

Output mode	S mode	H mode	L mode	B mode	I mode	F mode
Parameter	StArd	oUt-h	oUt-L	oUt-b	oUt-I	oUt-F
Comparative output limit	◐	X	X	◐	X	◐
Start compensation timer	◐	◐	◐	◐	◐	◐

■ Input Specifications



※T: Single cycle of input signal

1. Input signal

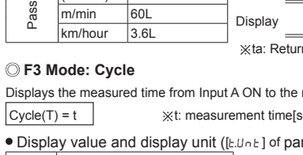
(1)Solid state input
①Input frequency: max. 50kHz (standard duty ratio of input signal: 1: 1, ON/OFF pulse width: min. 10μs of each)
②Input voltage level: ON voltage → 4.5-24V, OFF voltage → 0-1.0V

(2)Contact input
①Input frequency: max. 45Hz(when each ON/OFF pulse width is over 11ms)
②Contact specifications: 12VDC, stable switching of load current as small as 5mA

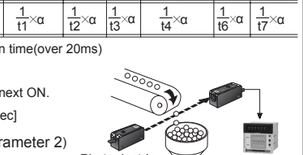
2. Input type[n-A, n-b]

MP5M allows selection between NPN input(solid state/contact) or PNP input(solid state/contact).

(1)NPN input type



(2)PNP input type



■ Operation Modes[mode]

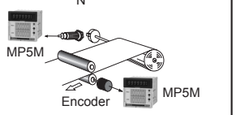
◎ F1 Mode: Frequency/Revolutions/Speed

Measures the frequency of input A and displays the calculated frequency, revolutions, and speed.

1) Frequency(Hz)	= f × α	(α= 1[sec])
2) Revolutions(rpm)	= f × α	(α= 60[sec])
3) Speed(m/min)	= f × α	(α= 60L[sec])

※L: travel distance of conveyor belt of 1 cycle [m]
α: prescale value

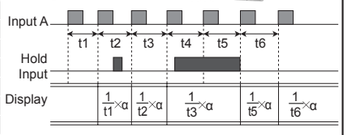
For multiple objects, $\alpha = \frac{60L}{N}$



● Display value and display unit

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

● Timing chart



◎ F2 Mode: Passing Speed

Displays the passing speed between input A ON and input B ON.

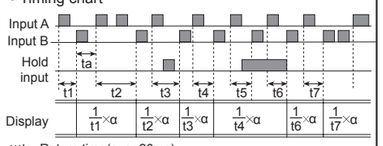
Passing speed (V) = f × α (α = L[m])

※f : reciprocal of time [sec.] between input A (sensor) ON and input B (sensor) ON.
L: distance between input A (sensor) and input B (sensor) [m]
α: prescale value

● Display value and display unit

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

● Timing chart



※ta: Return time(over 20ms)

◎ F3 Mode: Cycle

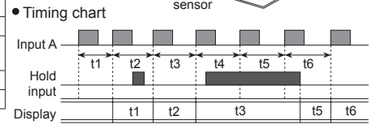
Displays the measured time from Input A ON to the next ON.

Cycle(T) = t ※t: measurement time[sec]

● Display value and display unit ([Unit] of parameter 2)

Display value	Display unit	
	Sec.	Min.
Cycle	999.99s (default)	999.99m
	9999.9s	9999.9m
	99999s	99999m

● Timing chart



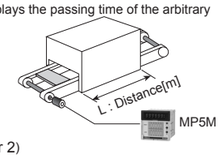
◎ F4 Mode: Passing Time

Measures the time from Input A ON to the next ON, and displays the passing time of the arbitrary distance.

Passing time[sec]= t × α

$(\alpha = \frac{L[m]}{\text{Distance advanced in 1 pulse cycle [m]}})$

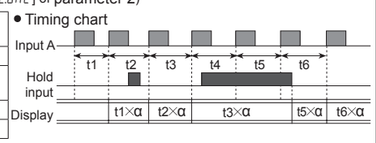
※t : measured time[sec], L : arbitrary distance[m]
α: prescale value



● Display value and display unit ([Unit] of parameter 2)

Display value	Display unit	
	SEC	MIN
Passing time	999.99s (default)	999.99m
	9999.9s	9999.9m
	99999s	99999m

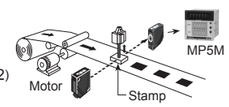
● Timing chart



◎ F5 Mode: Time Interval

Displays measured time of Input A ON

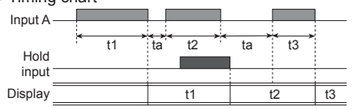
Time interval(T) = t ※t: measured time of input A ON [sec]



● Display value and display unit ([Unit] of parameter 2)

Display value	Display unit	
	Sec.	Min.
Time interval	999.99s (default)	999.99m
	9999.9s	9999.9m
	99999s	99999m

● Timing chart



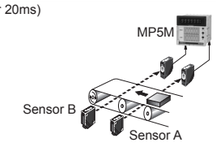
※ta: return time (over 20ms)

◎ F6 Mode: Time Differential

Displays measured time from Input A ON to Input B ON.

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

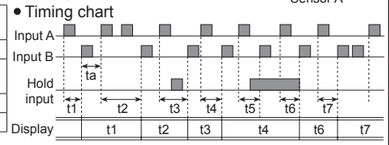
※t(ta to tb): measured time from input A ON to input B ON [sec]



● Display value and display unit ([Unit] of parameter 2)

Display value	Display unit	
	SEC	MIN
Time difference	999.99s (default)	999.99m
	9999.9s	9999.9m
	99999s	99999m

● Timing chart



※ta: return time (over 20ms)

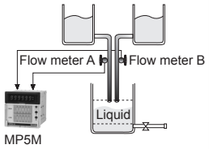
◎ F7 Mode: Absolute Ratio

Measures and displays relative speed, amount, speed, etc. of input B against input A in percentage (%).

Absolute ratio = (Input B / Input A) × 100%

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

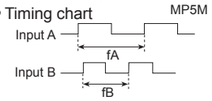
※Aα: Prescale value of input A, Bα: Prescale value of input B



● Display value and display unit

Display value	Display unit
Absolute ratio	%

● Timing chart



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

※Hold: When the hold signal turns ON, the display value is maintained until the display cycle turns to hold OFF.

◎ F8 Mode: Density

Measures and displays the density ratio (%) of input B against the total sum of input A and input B.

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

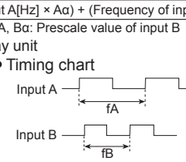
$\text{Density} = \frac{\text{Frequency of Input B[Hz]} \times B\alpha}{(\text{Frequency of input A[Hz]} \times A\alpha) + (\text{Frequency of input B[Hz]} \times B\alpha)} \times 100[\%]$

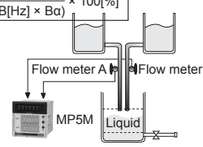
※Aα: Prescale value of input A, Bα: Prescale value of input B

● Display value and display unit

Display value	Display unit
Density	%

● Timing chart





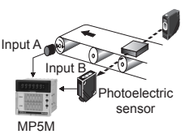
※Hold: When the hold signal turns ON, the display value is maintained until the display cycle turns to hold OFF.

◎ F9 Mode: Length Measurement 1

Measure and display the number of input A pulses during input B ON.

Length measurement = P × α

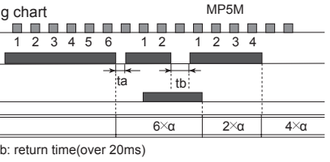
※P: Number of input A pulses, α: Prescale value



● Display value and display unit

Display value	Display unit
Length measurement	Quantity (default)
	mm
	cm
	m

● Timing chart



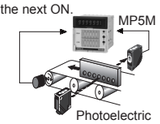
※ta, tb: return time(over 20ms)

◎ F10 Mode: Interval

Measures and displays the number of input A pulses from Input B ON to the next ON.

Interval = P × α

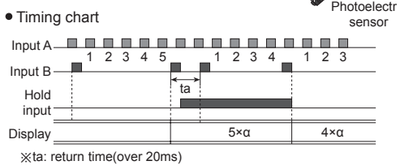
※P: Number of input A pulses, α: Prescale value



● Display value and display unit

Display value	Display unit
Interval	Quantity (default)
	mm
	cm
	m

● Timing chart

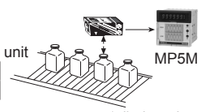


※ta: return time(over 20ms)

◎ F11 Mode: Accumulation

Measures and displays the counted value of input A pulses.

Accumulation = P × α



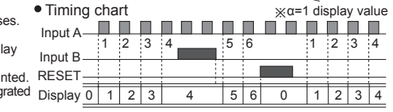
※P: Number of input A pulses, α: Prescale value

● Display value and display unit

Display value	Display unit
Accumulation	Quantity[EA]

● Operation
①Counts the number of input A pulses.
②Input B is an enable input signal. During ON, the quantity and display value of input A will be held, and during OFF input A will be re-counted.
③When RESET input is ON, the integrated counted value will be reset to "0".

● Timing chart ※α=1 display value

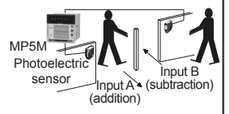


◎ F12 Mode: Addition/Subtraction-Individual Input

Displays the counted value from added input A pulses and subtracted input B pulses. When there are two inputs simultaneously, it will not count.

Addition/Subtraction = Input A × α - Input B × β

※α: Prescale value of input A, β: Prescale value of input B



● Display value and display unit

Display value	Display unit
Addition/Subtraction (individual input)	Quantity

● Operation and timing chart

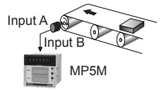
Pulse of input A is added, and pulse of input B is subtracted.

※α, β=1 display value

◎ F13 Mode: Addition/Subtraction-Phase difference input

When input A is low, counting is added to the low of input B.
When input A is low, counting is subtracted from the high of input B.

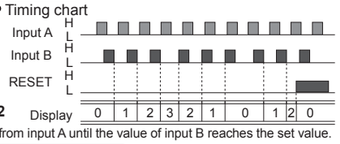
Addition/Subtraction(phase difference)
= Detects position and speed using A and B phases of encoder outputs as input.



● Display value and display unit

Display value	Display unit
Up/Down counting (phase difference input)	Quantity

● Timing chart



◎ F14 Mode: Length Measurement 2

Measures and displays the number of pulses from input A until the value of input B reaches the set value.

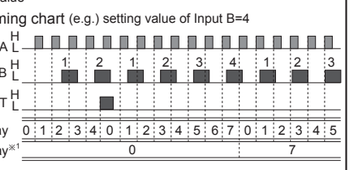
Length measurement 2 = P × α (until the setting value of Input B)

※P: Number of input A pulses, α: Prescale value

● Display value and display unit

Display value	Display unit
Length measurement 2	Quantity[EA]

● Timing chart (e.g.) setting value of Input B=4



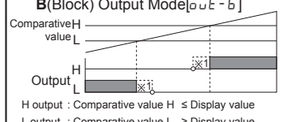
※If input A and input B are ON during initial power supply, it will not count and only count the number of rising edge.
※Display value is renewed depending on the display cycle [dI SPLt] setting.
※1: When the display cycle[dI SPLt] setting is oFF, it will maintain the quantity of input A until the value of input B reaches the setting value B[CoUnb].

■ Output Modes [out-t]

- MP5M-□1: S output mode, MP5M-□2: S, B, H, L, I, F output mode
- Requirement for setting comparative value: (B output mode) L<H, (F output mode) L<H, (other output modes) individual output operation regardless of size or order of set comparative values.

※1: hysteresis

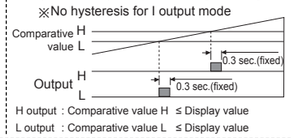
◎ S(Standard) Output Mode[StAnd] B(Block) Output Mode[out-b]



H output : Comparative value H ≤ Display value
L output : Comparative value L ≥ Display value

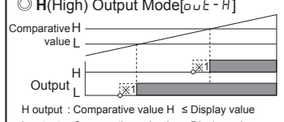
◎ I(One Shot) Output Mode[out-I]

※No hysteresis for I output mode



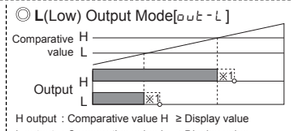
H output : Comparative value H ≤ Display value
L output : Comparative value L ≤ Display value

◎ H(High) Output Mode[out-H]



H output : Comparative value H ≤ Display value
L output : Comparative value L ≤ Display value

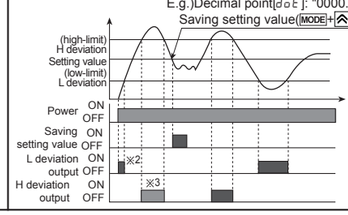
◎ L(Low) Output Mode[out-L]



H output : Comparative value H ≥ Display value
L output : Comparative value L ≥ Display value

◎ F(Deflection) Output Mode[out-F]

Transmits outputs when the saved setting value exceeds H deviation or L deviation.
- Saving setting value: Press the MODE+∧ keys to save as setting value.
- Checking setting value: Press the ∧ key to check the setting value.
- Setting deviation: Based on the setting value, set H deviation, L deviation by the thumbwheel switches. (the set deviation value is saved during Power OFF until it is re-set.)
- Deviation setting range: 0.0001 to 99999(setting range depends on the decimal point [dot] setting.) E.g.)Decimal point[dot]: "0000.0", Setting range: 0.1 to 9999.9

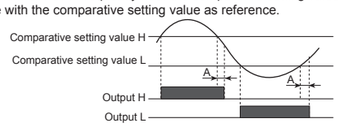


※2: When selecting initial comparative output limit function, it does not transmit outputs.
※3: The graph is assuming that there is a saved setting value prior to the setting value save point. The actual output position may be different.
※The deviation can be set to "0" but the actual operation will be the same as "1".

■ Function

◎ Hysteresis[HYS]

The output may turn ON/OFF frequently near the comparative setting value. To prevent this, set the hysteresis value with the comparative setting value as reference.



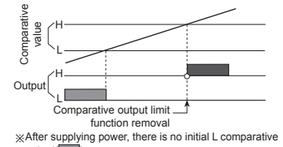
※A: hysteresis value
※The hysteresis value can be set to "0" but the actual operation value will be at "1".

◎ Delay Monitoring [dUAr.d]

After supplying power, the the starting current of motors and other inputs may experience changes. This function allows stable control by limiting all outputs for a certain period until the target measurement unit stabilizes. It may also control L outputs until a specific output is reached.

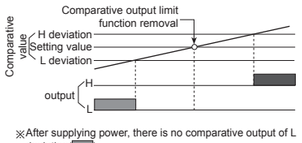
- Comparative output limit function [F.dEFY]: Only for S(Standard), B(Block), F(Deflection) output mode.
  : Limits L output before H output.

1)During S(Standard), B(Block) output mode



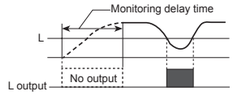
※After supplying power, there is no initial L comparative output( ).
※Each setting value of H, L is not related to their relative sizes. Hence, H value may be lower or equal to L value.

2)During F(Deflection) output mode



※After supplying power, there is no comparative output of L deviation( ).
※H and L deviation are not related to their relative sizes. (H deviation setting value > L deviation setting value, H deviation setting value < L deviation setting value)

- Start compensation timer function[StArt]



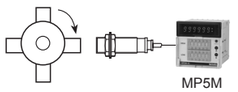
Set monitoring delay time so that there is no output during the delay time.

◎ Auto-Zero Time Setting[AUtoA, AUtob]

When there is no input signal during auto-zero set time, the display value is automatically set to 0(zero). Please set the auto-zero set time so that it is longer than the interval of the slowest input signal. If the setting time is too long and there is no input signal, the rate at which the display value falls to 0(zero) decrease, and output response rate may slow down.

◎ Prescale[PSC.□H, PSC.□Y]

Displays values in required units or specific multiples by counting the number of input pulses, then multiplying the number of pulses or the length of pulses by variables(X×10y).



Number of revolutions(rpm) = f×α
= f×60×(1 / N)
= f×60×(1 / 4)
= f×60×0.25
= f×15

※f: The number of input pulses per second[Hz],
α: Prescale value
N: The number of pulses per revolution

- Setting prescale value(α=15)
  Set mantissa(X) as 1.5000, and exponent(Y) as 1 for prescale value(α)=15.
  The same display value can be obtained with α value set as X=0.1500, and Y=2.

■ Cautions During Use

1. Please separate the unit wiring from high voltage lines or power lines to prevent inductive noise.
2. Install a power switch or circuit breaker to control the power supply.
3. The power switch or circuit breaker should be installed where it is easily accessible by the user.
4. Do not use the unit in the following environments.
   ① Environments with high vibration or shock.
   ② Environments with exposure to direct sunlight.
   ③ Near machinery which produce strong magnetic force or electric noise.
5. Storing the unit
   When storing the unit for an extended period, please avoid direct exposure to sunlight. Ambient temperature should be between -20℃ to 60℃ and ambient humidity should be between 35% to 85%RH. Store in factory packaging for best results.
6. Input line
   Please use a shield wire in environments where noise may occur or instances where long measurement input lines are required.
7. Please maintain distance between the power supply line and measurement input line.
8. This product may be used in the following environments
   ① Indoors
   ②Max. altitude: 2,000m
   ③Pollution degree 2
   ④Installation category II

※Failure to follow these instructions may result in product damage.

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, Co₂, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSR/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse(Rate) Meters
- Display Units
- Sensor Controllers

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