

Thumbwheel Switch Multi Pulse Meters

MP5M Series

INSTRUCTION MANUAL

DRW160446AH

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

For your safety, read and follow the below safety considerations before using.

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

Keep this instruction manual in a place where you can find easily.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

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

01. 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, economic loss or fire.

02. Do not use the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
Failure to follow this instruction may result in explosion or fire.

03. Install on a device panel to use.
Failure to follow this instruction may result in fire or electric shock.

04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire or electric shock.

05. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

Caution Failure to follow instructions may result in injury or product damage.

01. When connecting the power / measurement input and relay output, use AWG 24 (0.20 mm²) to AWG 15 (1.65 mm²) cable and tighten the terminal screw with a tightening torque of 0.98 to 1.18 N·m. Use the wiring suitable for the load current capacity.
Failure to follow this instruction may result in fire or malfunction due to contact failure.

02. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.

03. Use dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire or electric shock.

04. Keep the product away from metal chip, dust, and wire residue which from flowing into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Power supply should be insulated and limited voltage / current or Class 2, SELV power supply device.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000 m
 - Pollution degree 2
 - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

MP 5 M - ① ②

① Power supply

2: 24 VAC~ 50 / 60 Hz, 24 - 48 VDC==
4: 100 - 240 VAC~ 50 / 60 Hz

② Output

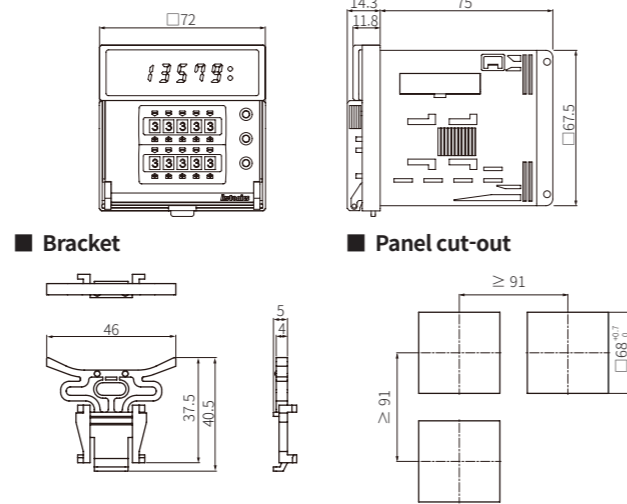
N: Indicator
1: Relay single (high-limit) + NPN open collector output
2: Relay double (high / low-limit) + NPN open collector output

Product Components

- Product (+ bracket)
- Instruction manual

Dimensions

Unit: mm, For the detailed drawings, follow the Autonics website.

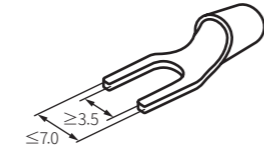


Connections

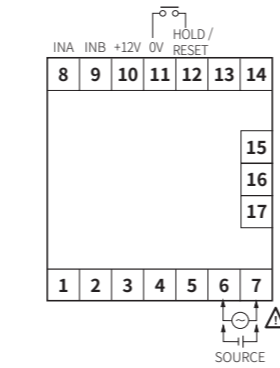
- HOLD / RESET terminal function is different depending on the operation mode. (F1 to F10: HOLD, F11 to F14: RESET)
- SOURCE: 100 - 240 VAC~ 50 / 60 Hz 9 VA
24 VAC~ 50 / 60 Hz 6.5 VA, 24 - 48 VDC= 5 W

Cautions during Wiring

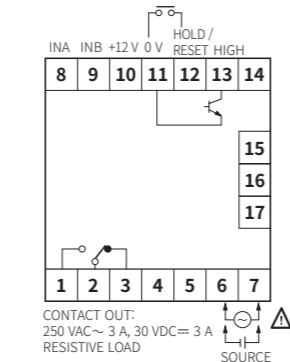
Unit: mm, Use terminals of size specified below.



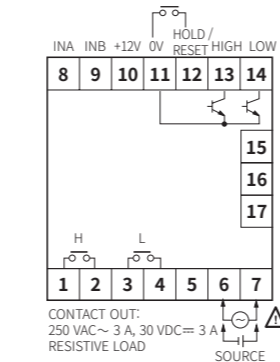
Indicator



Relay single output



Relay double output



Specifications

Series	MP5M-□N	MP5M-□1	MP5M-□2
Input signal⁽⁰¹⁾	Solid state input 1: ≤ 50 kHz (pulse width: ≥ 10 μs) Solid state input 2 ⁽⁰²⁾ : ≤ 5 kHz (pulse width: ≥ 100 μs) Contact input: ≤ 45 Hz (contact: ≥ 12 VDC= 5 mA, pulse width: ≥ 11 ms)		
Voltage input	Input impedance: 3.9 kΩ, [H]: 4.5 - 24 VDC=, [L]: 0 - 1 VDC=		
No-voltage input	Short-circuit impedance: ≤ 80 Ω, residual voltage: ≤ 1 VDC=, open-circuit impedance: ≥ 100 kΩ		
Display method	7-segment LED (zero blanking method)		
Character size	W 4 × H 8 mm		
Prescale	0.0001 × 10 ⁿ to 9.9999 × 10 ⁿ		
Hysteresis	0 to 9999 ⁽⁰³⁾		
Display cycle	OFF ⁽⁰⁴⁾ , 0.05, 0.5, 1, 2, 4, 8 sec (same as update output cycle)		
Display range	-19999 to 99999		
Contact control output	Relay		
Type	1c × 1	1a × 2	
Capacity	250 VAC~ 3 A, 30 VDC= 3 A resistive load	250 VAC~ 3 A, 30 VDC= 3 A resistive load	
Solid-state control output	NPN open collector		
Type	× 1	× 2	
Capacity	≤ 30 VDC= 100 mA	≤ 30 VDC= 100 mA	
Approval	CE, RoHS, ENEC		
Unit weight (package)	≈ 168 g (≈ 243 g)	≈ 181 g (≈ 256g)	≈ 190 g (≈ 265 g)

01) Standard duty ratio 1:1

02) Operation mode F7, F8: ≤ 1 kHz (pulse width: ≥ 500 μs)

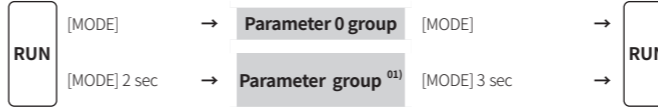
03) The hysteresis setting range varies according to the decimal point setting position.

04) Only available operation mode F2, F14

	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC~ ± 10 % 50 / 60 Hz	24 VAC~ ± 10 % 50 / 60 Hz, 24 - 48 VDC= ± 10 %
Power consumption	≤ 9 VA	AC: ≤ 6.5 VA, DC: ≤ 5 W
External power supply	≤ 12 VDC= ± 10 % 80 mA	
Memory retention	Number of inputs: 100,000 operations (non-volatile semiconductor memory type)	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Dielectric strength	2,000 VAC~ 60 Hz for 1 min	
Noise immunity	± 2 kV the square wave noise (pulse width: 1μs) by the noise simulator	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300m / s ² (≈ 30G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100m / s ² (≈ 30G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	

Operation mode	Measurement range	Measurement accuracy (23 ± 5 °C)
F1 Frequency / revolutions / speed	0.0005 Hz to 50 kHz	F.S. ± 0.05 % rdg ± 1-digit
F2 Passing speed		
F3 Cycle		
F4 Passing time	0.01 to max. of each time range	F.S. ± 0.01 % rdg ± 1-digit
F5 Time interval		
F6 Time differential		
F7 Absolute ratio	0.0005 Hz to 50 kHz	F.S. ± 0.05 % rdg ± 1-digit
F8 Density		
F9 Length measurement 1		
F10 Interval	0 to 999999	
F11 Accumulation		
F12 Addition / subtraction-individual input	-19999 to 99999	
F13 Addition / subtraction-phase difference input		
F14 Length measurement 2	0 to 99999	

Mode Setting



01) Press [▲], [◀] key or [MODE] key for 1.5 sec. after entering parameter: select parameter groups.

Parameter Setting

- Some parameters are activated / deactivated depending on the model or setting of other parameters. Refer to the description of each parameter.
- The parameter and setting value are cross-displayed on the display part.
- If any key is not entered for 60 sec in each parameter, it returns to RUN mode.
- [MODE] key: Saves current setting value and moves to the next parameter.
- [▶] key: Checks fixed value / Changes setting digits.
- [▲], [◀] key: Changes setting values.

Parameter 0 group

Parameter	Display	Default	Setting range	Display condition
P0-1 Max. monitoring value	HPEE	99999		P1-1 Input operation mode: except F11, F14
P0-2 Min. monitoring value	LPEE	+9999	• Reset (PV): [▶] key for over 2 sec	

Parameter 1 group

Parameter	Display	Default	Setting range	Display condition
P1-1 Input operation mode	no d E	F I	F1 to F14	-
P1-2 Input A sensor type	I n - A	n P n H F	NPN.H.F: NPN non-contact input1 NPN.L.F: NPN non-contact input2	-
P1-3 Input B sensor type	I n - b	n P n H F	PNP.H.F: PNP non-contact input1 PNP.L.F: PNP non-contact input2	P1-1 Input operation mode: F2, F6 to 12, F14 ⁽⁰¹⁾
P1-4 Output mode	o U t - t	5 t R r d	[Relay double output model] STARD: S (Standard) OUT.H: H (High) OUT.L: L (Low) OUT.B: B (Block) OUT.I: I (One-shot) OUT.F: F (Deflection) *	P1-1 Input operation mode: except F11 & * P1-1 Input operation mode: except F14
P1-5 Output hysteresis	H Y S	0 0 0 I	[Relay single / double output model] 0000 to 9999 • Varies according to P2-1 Decimal point position of display value	P1-1 Input operation mode: F1, F7 to 8
P1-6 Delay monitoring	G U R r d	F d E F Y	[Relay double output model] F.DEFY: L comparative output limit * START: Start compensation timer ⁽⁰²⁾	P1-1 Input operation mode: F1 to 10 * P1-4 Output mode: S, B, F
P1-7 Compensation time	5 t R r t	0 0	[Relay double output model] 0.0 to 99.9 sec	P1-6 Delay monitoring: START
P1-8 Input A auto-zero time	A U t a R	9 9 9 9 9	0.1 to 9999.9 sec	P1-1 Input operation mode: F1, F4, F7 to 8
P1-9 Input B auto-zero time	A U t a b	9 9 9 9 9		P1-1 Input operation mode: F7 to 8
P1-10 Memory retention	n E n o	o F F	OFF, ON	P1-1 Input operation mode: F11 to 14

01) In case of P1-1 Input operation mode F13, input B sensor type is not displayed and IN-B setting is same as IN-A.
02) [◀] key: Entering compensation time setting.

Parameter 2 group

Parameter	Display	Default	Setting range	Display condition
P2-1 Decimal point position of display value	d o t	0 0 0 0 0	00000, 0000.0, 000.00, 00.000, 0.0000	P1-1 Input operation mode: F1 to 2, F7 to 14
P2-2 Time unit ⁽⁰¹⁾	t U n t	t.5 E t	T, SEC, T, MIN	
P2-3 Time range (unit: sec) ⁽⁰¹⁾	t.5 E t	9 9 9 9 9	999.99: 999.99 s 9999.9: 9999.9 s 99999: 99999 s	P1-1 Input operation mode: F3 to 6
P2-4 Time range (unit: min) ⁽⁰¹⁾	t. n t	9 9 9 9 9	999.99: 999.99 m 9999.9: 9999.9 m 99999: 99999 m	
P2-5 Input A prescale mantissa (x)	P S C. A H	6 0 0 0 0	0.0001 to 9.9999	P1-1 Input operation mode: F1 to 2, F4, F7 to 14
P2-6 Input A prescale exponent (y)	P S C. A Y	I 0 0 I	10 - 9 (10 ⁿ) to 10 09 (10 ⁰)	
P2-7 Input B prescale mantissa (x)	P S C. b H	6 0 0 0 0	0.0001 to 9.9999	P1-1 Input operation mode: F7 to 8
P2-8 Input B prescale exponent (y)	P S C. b Y	I 0 0 I	10 - 9 (10 ⁿ) to 10 09 (10 ⁰)	
P2-9 Display cycle	d I S P t	0 0 5	OFF ⁽⁰²⁾ or 0.05, 0.5, 1, 2, 4, 8 sec	P1-1 Input operation mode: F1 to 2, F7 to 8, F14
P2-10 Input B setting value (INB)	I o U n b	9 9 9 9 9	1 to 99999	P1-1 Input operation mode: F14

01) To enter P2-3 time range (unit: sec) and P2-4 time range (unit: min) setting, press [▲] key at P2-2 time unit.
02) Only available operation mode F2, F14

Parameter 3 group

Parameter	Display	Default	Setting range	Display condition
P3-1 Lock	L o C	o F F	OFF: Unlock LOC.0: Lock All LOC.1: Lock parameter 1 / 2 / 3 LOC.2: Lock parameter 2 / 3 LOC.3: Lock parameter 3	-
P3-2 Parameter reset	n r 5 t	E n A	ENA: enable, DISA: disable	-