

# MEASURE COUNTER FM/LM 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.
  - Warning**: Injury or danger may occur under special conditions.

## Warning

- In case of using this unit with machineries (Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information required. It may result in serious damage, fire or human injury.
- This unit must be mounted on Panel. It may give an electric shock.
- Do not connect terminals when it is power on. It may give an electric shock.
- Do not disassemble and modify this unit, when it requires. If needs, please contact us. It may give an electric shock and cause a fire.

## Caution

- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock.
- When wire connection, No.20AWG(0.50mm<sup>2</sup>) should be used and screw bolt on terminal block with 0.74N·m to 0.90N·m strength. It may result in malfunction or fire due to contact failure.
- Please observe specification rating. It might shorten the life cycle of the product and cause a fire.
- Do not use the load beyond rated switching capacity of Relay contact. It may cause insulation failure, contact melt, contact failure, relay broken, fire etc.
- In cleaning the unit, do not use water or an organic solvents. It might cause an electric shock or fire that will result in damage to the product.
- Do not use this unit at place where there are flammable or explosive gas, humidity, direct ray of the sun, radiant heat, vibration, impact etc. It may cause explosion.
- Do not inflow dust or wire dregs into inside of this unit. It may cause a fire or mechanical trouble.

## What is measure counter?

It can be set an integer(n) of multiplier or an interger(n) of divisor per one pulse input.

**Multi mode**

SW2 Function: ON Multi, OFF Divide

Count input × Setting value (SW3) = Display value  
1 × 4 = 4

**Divide mode**

SW2 Function: ON Multi, OFF Divide

The divide mode has the function of displaying the value added each 1 whenever the measured value is the same as the setting value (divisor) of SW3.

Count input = Display value  
5 / 5 = 1

## Input operation mode

Input mode	SW1	Counting chart	
		Voltage input type	No-voltage input type
Up/Down-A Command input	ON		
Up/Down-B Individual input	ON		
Up/Down-C Phase difference input	ON		
Up Input	ON		
	OFF		
Up/Down-D Command input	ON		
	OFF		
Up/Down-E Individual input	ON		
	OFF		
Up/Down-F Phase difference input	ON		
	OFF		
Down Input	ON		
	OFF		

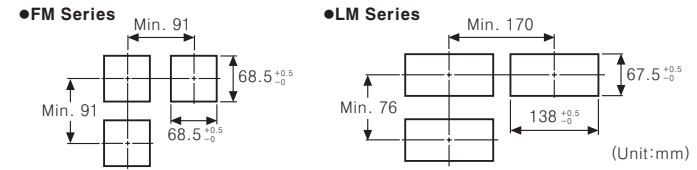
\*A: Over Min. signal width, B: Over 1/2 of Min. signal width. Counting miss by one(±1) is occurred if the signal width of A or B is less than min. signal width.

\*The above specification are changeable without notice anytime.

## Specifications

Series	FM		LM	
	4	6	4	6
Digit	4	6	4	6
Model	Single preset: F4AM Double preset: F4AM-2P Indication type: F4BM	Single preset: F6AM Double preset: F6AM-2P Indication type: F6BM	Single preset: L4AM-2P Indication type: L4BM	Single preset: L6AM-2P Indication type: L6BM
Power supply	AC power: 100~240VAC 50/60Hz AC/DC power: 12~24VAC 50/60Hz, 12~24VDC			
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	AC power: Indication: Approx. 4.7VA, Single preset: Approx. 5.6VA, Double preset: Approx. 6.4VA(240VAC 50/60Hz) AC/DC power: Indication: Approx. 5.1VA, Single preset: Approx. 6V, Double preset: Approx. 6.5VA(24VAC 50/60Hz) Indication: Approx. 2.7W, Single preset: Approx. 3.3W, Double preset: Approx. 3.8W(24VDC)			
Max. counting speed	Selectable 1cps/30cps/2kcps/5kcps by inner DIP switch			
Min. Reset input width	20ms			
Input	CP1, CP2 input: Input logic is selectable [Voltage input] Input impedance: 5.4kΩ, "H" level: 5~30VDC, "L" level: 0~2VDC [No-voltage input] Short-circuit impedance: Max. 1kΩ, Residual voltage: Max. 2VDC, Open-circuit impedance: Min. 100kΩ RESET input: 250VAC 3A resistive load			
One-shot output time	Single preset: 0.5sec, Double preset: 0.05~5sec			
Control output	Type: Single preset type: SPDT(1c) Double preset type (FM Series): Single preset SPST(1a), Double preset SPST(1a) Double preset type (LM Series): Single preset SPDT(1c), Double preset SPDT(1c) Capacity: 250VAC 3A resistive load Solid-state: Type: Single preset type: NPN open collector Double preset type: 1st output NPN open collector, 2nd output NPN open collector Capacity: 30VDC Max. 100mA Max.			
Memory retention	10 years (EEPROM)			
External power supply	12VDC ±10% 50mA Max.			
Ambient temperature	-10 ~ 55°C (at non-freezing status)			
Storage temperature	-25 ~ 65°C (at non-freezing status)			
Ambient humidity	35 ~ 85%RH			

## Panel cut-out



## Input connection

**Input logic : Voltage input (PNP)**

- No-voltage input (Standard input sensor: PNP output type sensor)
- Contact input Counter

**Input logic : No-voltage input (NPN)**

- No-voltage input (Standard input sensor: NPN output type sensor)
- Contact input Counter

\*CP1, CP2, RESET input part

## Input logic selection

\*Please be sure to turn power OFF before changing input logic.

**FM Series**

- No-voltage input (NPN) selection
- Voltage input (PNP) selection

**LM Series**

Input logic is changeable by input logic selection switch located at the terminal block.

- No-voltage input (NPN) selection
- Voltage input (PNP) selection

## Output operation mode

One-shot output (0.05~5sec) Hold output (0.5sec) of 1st output

\*The output of single preset type is operated at the status of the second output mode

Output mode	Input mode		Operation after Count up
	Up, Up/Down-A, B, C mode	Down, Up/Down-D, E, F mode	
<b>F</b>			The display value continues until Reset signal applied and the output will be held.
<b>N</b>			The display value and output will be held until Reset signal.
<b>C</b>			The display returns to initial status and 2nd output will be reset after one-shot time.
<b>R</b>			The display value will be held until 2nd output is OFF then reset.
<b>K</b>			The display value continues until Reset signal applied.
<b>P</b>			The display value is held during 2nd output one-shot time, counting process is returned to reset start status as soon as 2nd output ON.
<b>Q</b>			The display continues until 2nd output is OFF.
<b>S</b>			Up, Up/Down-A, B, C input mode -OUT1 is ON when (Display value) ≥ (1st preset value) -OUT2 is ON when (Display value) ≥ (Double preset value)

## Input · output connection

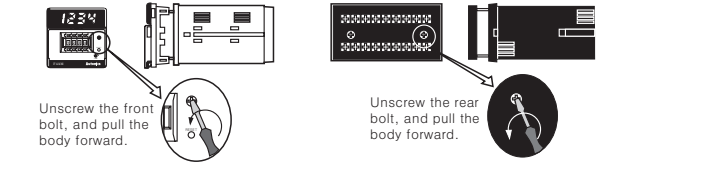
**In case of operating the load by power supply of the sensor**

**In case of operating the load by external power supply**

\*Please select proper capacity of Load 1, because total current consumption should not exceed current capacity (50mA max.).  
\*Contact capacity : 250VAC 3A Max.  
RESISTIVE LOAD

\*The capacity of Load 1 must not be exceed max. 30VDC, max. 100mA of the switching capacity of the transistor.  
\*Please do not supply the reverse polarity voltage.  
\*Please connect the surge absorber (Diode, Varistor, etc.) at both terminals of Load1, in case of using the inductive load.

## Case detachment



## Selection by DIP switches

**FM Series**

**LM Series**

1st output type (One-shot/Hold) selection  
Output mode selection  
Up/Down mode selection  
Input operation mode  
Multi/Divide selection  
Manual reset selection  
Max. counting speed selection

**Max. counting speed selection**

SW2	CP1, CP2
ON OFF	1 2
ON OFF	1 2
ON OFF	1 2
ON OFF	1 2

**Up/Down mode selection**

SW1	Function
ON OFF	Up mode
ON OFF	Down mode

**Selection of manual reset**

SW2	Function
ON OFF	Using front reset switch
ON OFF	Non-using front reset switch

**1st output type selection**

SW1	Function
ON OFF	One-shot output
ON OFF	Hold output

## Counting operation of indication model

**Up input mode** **Down input mode** **Up/Down-A, B, C input mode** **Up/Down-D, E, F input mode**

## Decimal point setting

**Decimal point setting**

Decimal point setting display ("dp" Flickering)

Decimal point setting

**Decimal point setting**

- 6Digit preset type
- 4Digit preset type

\*Existing decimal point setting is displayed when entering into decimal point setting mode.  
\*If pressing one of digital switch (2nd preset type: 2nd preset digital switch) Up(+) buttons in decimal point setting mode, decimal point will be moved to Up(+) direction.  
\*If pressing one of digital switch (2nd preset type: 2nd preset digital switch) Down(-) buttons, decimal point will be moved to Down(-) direction.

## Caution for using

- DIP switch setting  
Please be sure to turn power OFF before changing Counter DIP switches setting. If DIP switches setting is changed in power OFF, Counter must be reset by manual reset or external reset after power ON.
  - Error  

Error display	Error contents	Return method
Err0	Zero setting value status	Change setting value which is not zero

    - \*Output is OFF when error is displayed.
    - \*If 1st preset value is chaged to zero("0"), 1st output keeps OFF status.
    - \*No Error display is appeared in indication type.
  - Power  
    - ①The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.
    - ②Please use the power within rating power and apply or cut the power at once to prevent from chattering.
  - Input signal line  
    - ①Shorten the cable distance between the sensor and this product.
    - ②Please shielded wire for input signal needed to be long.
    - ③Please wire input signal line separated from power line.
  - When test dielectric voltage and insulation resistance of the control panel with this unit installed.  
    - ①Please isolate this unit from the circuit of control panel.
    - ②Please make all terminals of this unit short-circuited.
  - Do not use this unit at below places.  
    - ①Place where there are severe vibration or impact.
    - ②Place where strong alkalis or acids are used.
    - ③Place where there are direct ray of the sun
    - ④Place where strong magnetic field or electric noise are generated.
  - Installation environment  
    - ①It shall be used in indoor
    - ②Altitude Max. 2000m
    - ③Pollution Degree 2
    - ④Installation Category II.
- \*It may cause malfunction if above instructions are not followed.

## Main products

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

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