

Autonics COUNTER / TIMER FXM/FXH 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.
- ⚠ symbol represents caution due to special circumstances in which hazards may occur.
- 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.

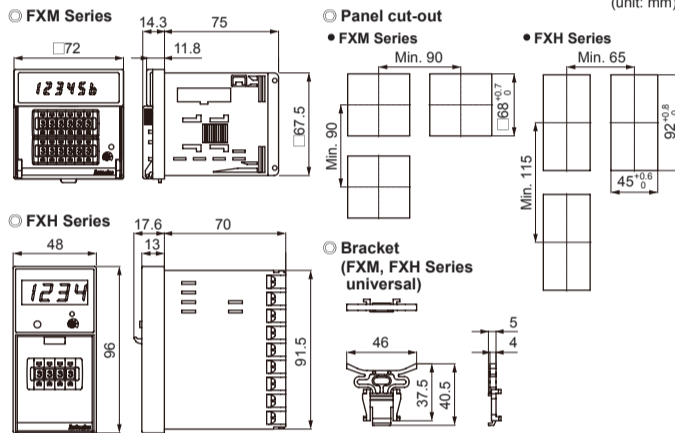
⚠ Warning

- 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 fire, personal injury, or economic loss.
- Install on a device panel to use.
- Failure to follow this instruction may result in electric shock or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in electric shock or fire.
- Check 'Connections' before wiring.
- Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.
- Failure to follow this instruction may result in electric shock or fire.

⚠ Caution

- When connecting the power/sensor input and relay output, use AWG 20(0.50mm²) cable or over, and tighten the terminal screw with a tightening torque of 0.74 to 0.90N·m. Failure to follow this instruction may result in fire or malfunction due to contact failure.
- Use the unit within the rated specifications.
- Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.
- Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
- Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit.
- Failure to follow this instruction may result in fire or product damage.

■ Dimensions

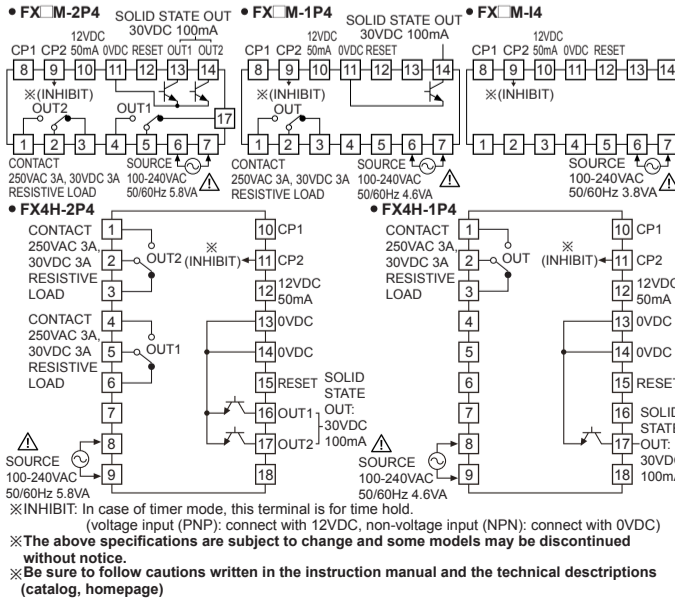


■ Specifications

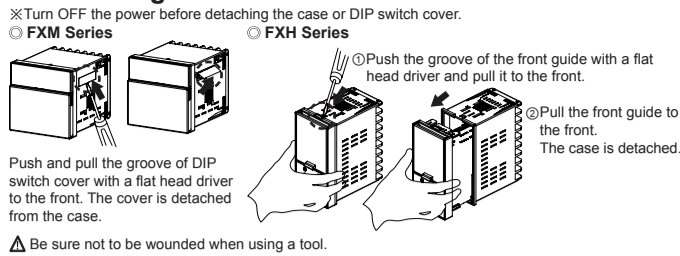
Model	1-stage setting	FX4H-1P4	FX4M-1P4	FX6M-1P4	FX8M-1P4
2-stage setting	FX4H-2P4	FX4M-2P4	FX6M-2P4	FX8M-2P4	
Indicator	—	FX4M-I4	FX6M-I4	FX8M-I4	
Display digit	4-digit	6-digit	6-digit	8-digit	
Character size (W×H)	6×10mm	6×10mm	4×8mm	3.8×7.6mm	
Power supply	100-240VAC ~ 50/60Hz				
Permissible voltage range	90 to 110% of rated voltage				
Power consumption	1-stage: max. 4.6VA 2-stage: max. 5.8VA Indicator: max. 3.8VA				
Max. counting speed of CP1/CP2	Selectable 1cps/30cps/2kcps/5kcps (DIP switch)				
Return time	Max. 500ms				
Min. signal width	INHIBIT, RESET: approx. 20ms				
Input method	Selectable voltage input (PNP) method or no-voltage input (NPN) method [Voltage input (PNP) method]-input impedance: max. 10.8kΩ, [H]: 5-30VDC=, [L]: 0-2VDC [No-voltage input (NPN) method]-short-circuit impedance: max. 470Ω, short-circuit residual voltage: max. 1VDC, open-circuit impedance: min. 100kΩ				
One-shot output time	1-stage: 0.05 to 5 sec 2-stage: 1st setting 0.5 sec fixed, 2nd setting 0.05 to 5 sec				
Control output	Contact: Type: 1-stage: Instantaneous SPDT (1c), 2-stage: OUT1-Instantaneous SPDT (1c), OUT2-Instantaneous SPDT (1c) Capacity: 250VAC ~ 3A, 30VDC ~ 3A resistive load Solid state: Type: 1-stage: 1 NPN open collector, 2-stage: OUT1-1 NPN open collector, OUT2-1 NPN open collector Capacity: Load voltage: max. 30VDC=, Load current: max. 100mA, Residual voltage: max. 1VDC=				
Relay life cycle	Mechanical: Min. 10,000,000 operations Electrical: Min. 100,000 operations (250VAC 3A resistive load)				
Repeat/Set/Voltage/Temp. error	Max. ±0.01% ±0.05 sec				
Insulation resistance	Over 100MΩ (at 500VDC megger)				
External power supply	Max. 12VDC = ±10% 50mA				
Memory retention	Approx. 10 years (non-volatile memory)				
Dielectric strength	2.00kVAC 50/60Hz for 1 min. (between all terminals and case)				
Noise immunity	±2kV the square wave noise (pulse width 1μs) by noise simulator				
Vibration	Mechanical: 0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour Malfunction: 0.5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes				
Shock	Mechanical: 300m/s ² (approx. 30G) in each X, Y, Z direction for 3 times Malfunction: 100m/s ² (approx. 10G) in each X, Y, Z direction for 3 times				
Environment	Ambient temp.: -10 to 55°C, storage: -25 to 65°C Ambient humi.: 35 to 85%RH, storage: 35 to 85%RH				
Protection structure	IP20 (front part, IEC standard)				
Approval	CE, UL				
Weight	1-stage setting/Approx. 245g (approx. 180g) 2-stage setting/Approx. 265g (approx. 200g) Indicator/Approx. 225g (approx. 160g)				

※1: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

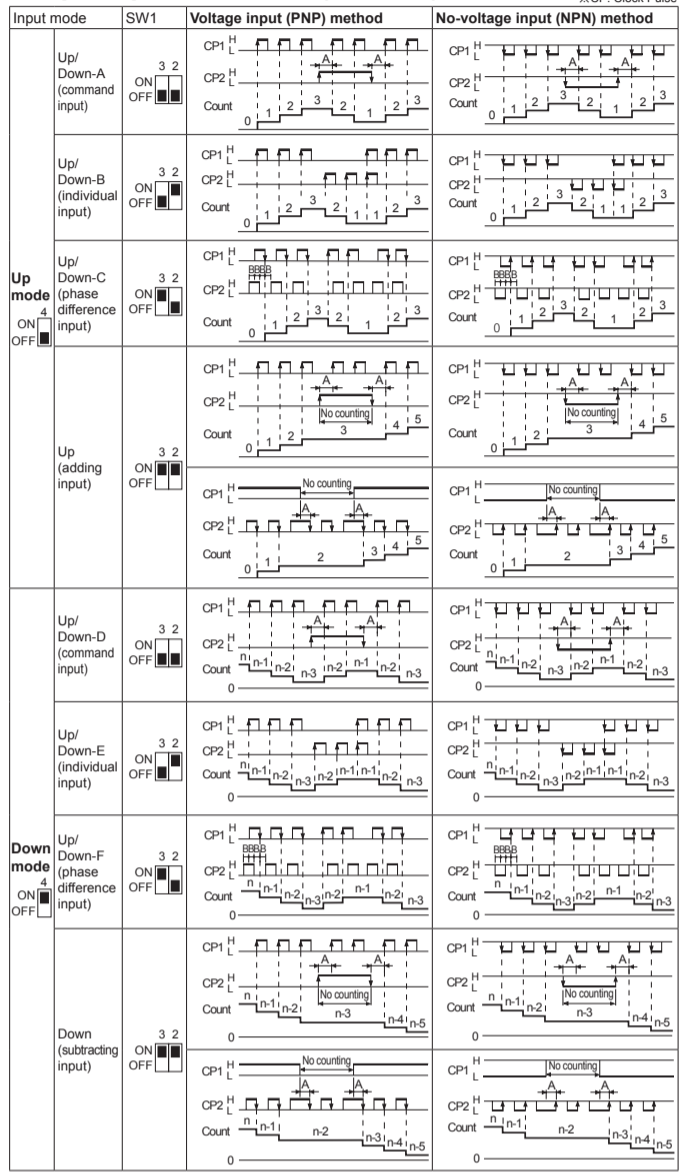
■ Connections



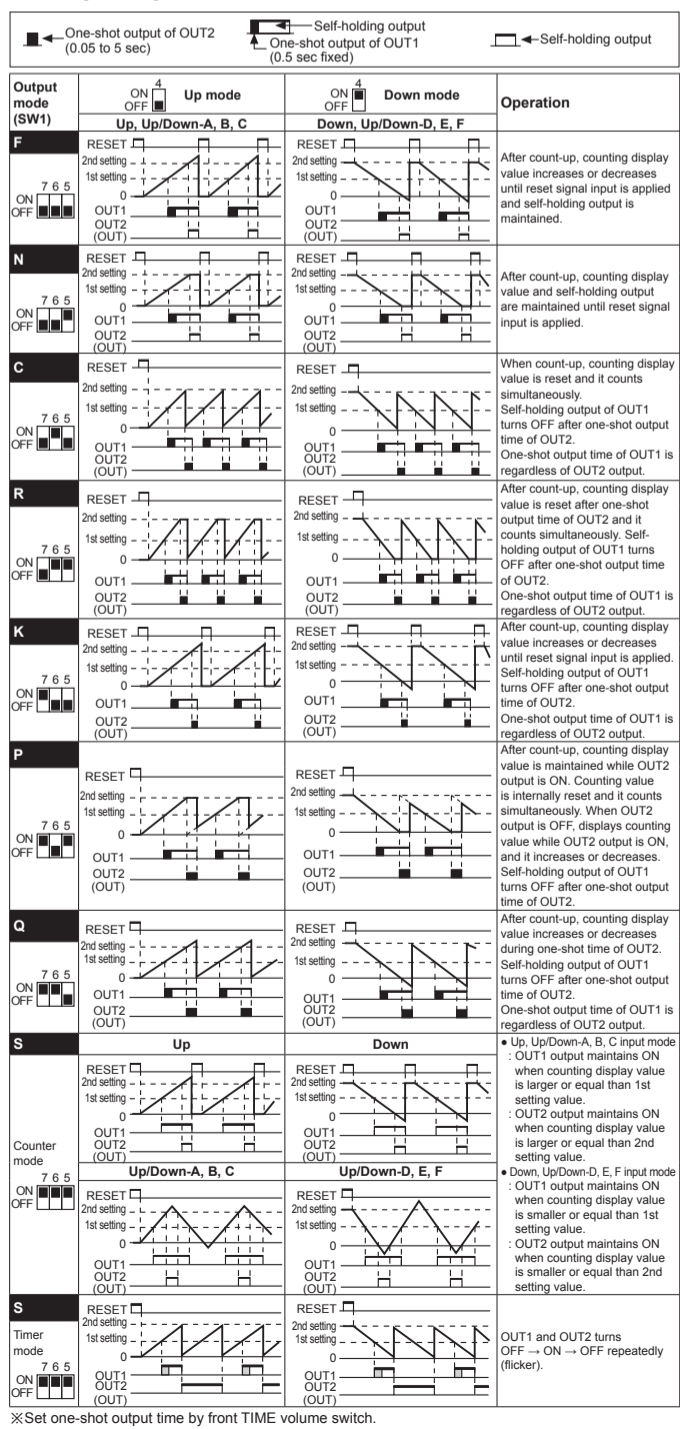
■ Detaching Case or DIP Switch Cover



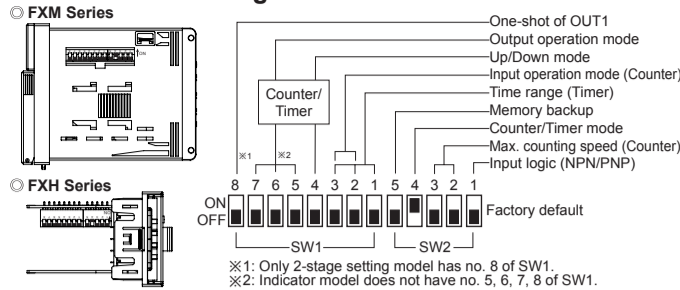
■ Input Operation Mode (Counter)



■ Output Operation Mode



■ DIP Switch Setting



● Input logic (CP1, CP2, INHIBIT, RESET input)

SW2	Function
ON	NPN (no-voltage input)
OFF	PNP (voltage input)

● Counter/Timer mode

SW2	Function
ON	Counter mode
OFF	Timer mode

● Max. counting speed (counter)

SW2	Function	1cps	30cps	2kcps	5kcps
ON	1cps	ON	ON	ON	ON
OFF	30cps	OFF	OFF	OFF	OFF

● Memory backup

SW2	Function
ON	No memory backup
OFF	Memory backup

● Up/Down mode

SW1	Function
ON	Down mode
OFF	Up mode

● Time range (timer)

SW1	4-digit	6-digit	8-digit
ON	99.99sec	99999.99sec	999999.99sec
OFF	999.9sec	999999sec	9999999.9sec
ON	9999sec	99min 59.99sec	9999999sec
OFF	99min 59sec	9999min 59.9sec	99999min 59.9sec
ON	999.9min	99999.9min	9999999.9min
OFF	99hour 59min	99hour 59sec	9999hour 59min 59sec
ON	999.9hour	9999hour 59min 59sec	99999hour 59min 59sec
OFF	9999hour	99999hour	999999hour

● One-shot output of OUT1

SW1	Function
ON	One-shot output of OUT1
OFF	Self-holding output of OUT1

※This function is for setting one-shot output (0.5 sec fixed) or self-holding output (until OUT2 turns OFF) of OUT1 at 2-stage setting model.
 ※Example of output operation mode F

RESET

2nd setting

1st setting

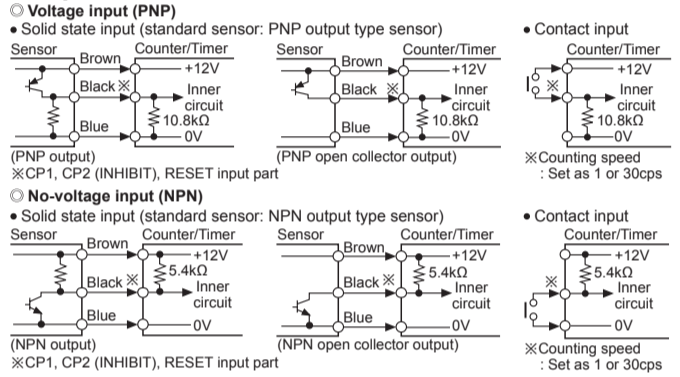
0.5 sec

OUT1 (One-shot output) Self-holding output

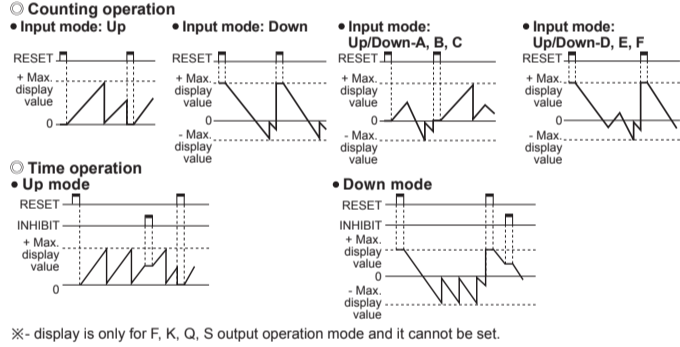
OUT2 (Self-holding output)

※How to change settings
 Power OFF → change settings → power ON → press [RESET] key or input signal (min. 20ms)

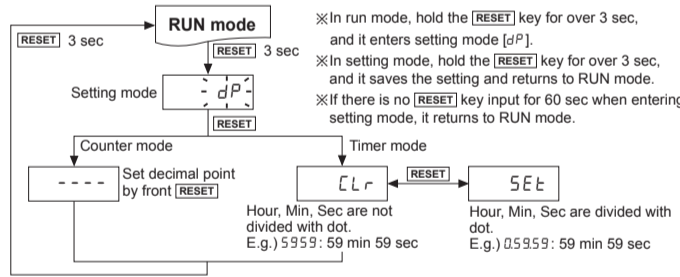
■ Input Connection



■ Counting & Time Operation for Indicator (FXM-I4)



■ Dot for Decimal Point / Hour. Min. Second



■ Error Display and Output Operation

Error Display	Error description	Troubleshooting
Err 0	Setting value is 0.	Change the setting value anything but 0.

※When error occurs, the output turns OFF.
 ※When 1st setting value is set as 0 (zero), OUT1 maintains OFF.
 ※When 2nd setting value is smaller than 1st setting value, 1st setting value is ignored and only OUT2 output operates. ※Indicator model does not have error display function.
 ※Indicator model does not have error display function.

■ Unit Sticker



■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Use the product, 0.1 sec after supplying power.
- When supplying or turning off the power, use a switch or etc. to avoid chattering.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- In case of contact input, set count speed to low speed mode (1cps or 30cps) to operate. If set to high speed mode (2kcps or 5kcps), counting error occurs due to chattering.
- 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 product may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
 - Fiber Optic Sensors
 - Door Sensors
 - Area Sensors
 - Proximity Sensors
 - Pressure Sensors
 - Rotary Encoders
 - Connector/Sockets
 - Switching Mode Power Supplies
 - Control Switches/Lamps/Buzzers
 - I/O Terminal Blocks & Cables
 - Stripper Motors/Drivers/Motion Controllers
 - Graphic Logic Panels
 - Field Network Devices
 - Laser Marking System (Fiber, Co., 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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