



Thank you for choosing our Autronics 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.
- 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.

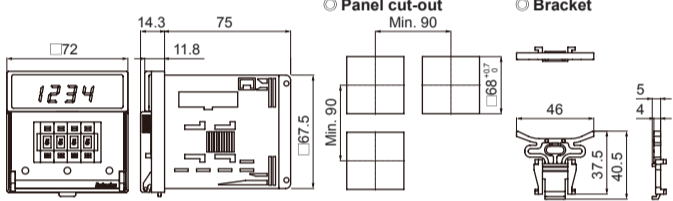
Warning

- 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.)
- Install on a device panel to use.
- Do not connect, repair, or inspect the unit while connected to a power source.
- Check 'Connections' before wiring.
- Do not disassemble or modify the unit.

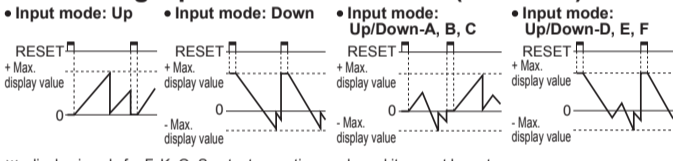
Caution

- 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.
- Use the unit within the rated specifications.
- Use dry cloth to clean the unit, and do not use water or organic solvent.
- 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.
- Keep metal chip, dust, and wire residue from flowing into the unit.

Dimensions



Counting Operation for Indicator (FM-M-14)



Input Operation Mode

Input mode	Voltage input (PNP) method	No-voltage input (NPN) method
Up/Down-A command input [Ud-A]	[Timing diagram]	[Timing diagram]
Up/Down-B individual input [Ud-B]	[Timing diagram]	[Timing diagram]
Up/Down-C phase difference input [Ud-C]	[Timing diagram]	[Timing diagram]
Up adding input [Up]	[Timing diagram]	[Timing diagram]
Up/Down-D command input [Ud-D]	[Timing diagram]	[Timing diagram]
Up/Down-E individual input [Ud-E]	[Timing diagram]	[Timing diagram]
Up/Down-F phase difference input [Ud-F]	[Timing diagram]	[Timing diagram]
Down subtracting input [dn]	[Timing diagram]	[Timing diagram]

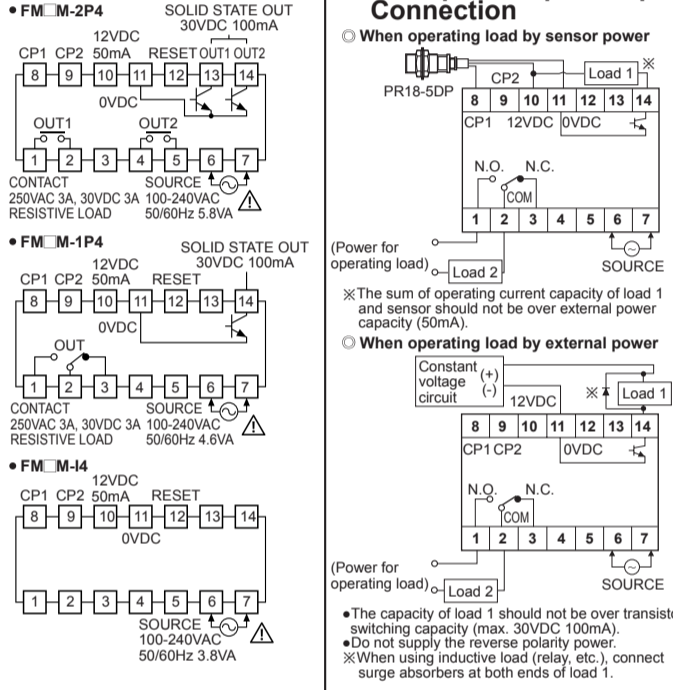
※A: over min. signal width, B: over than 1/2 of min. signal width.
 If the signal is smaller than these width, it may cause counting error (±1).
 ※The above specifications are subject to change and some models may be discontinued without notice.
 ※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

Specifications

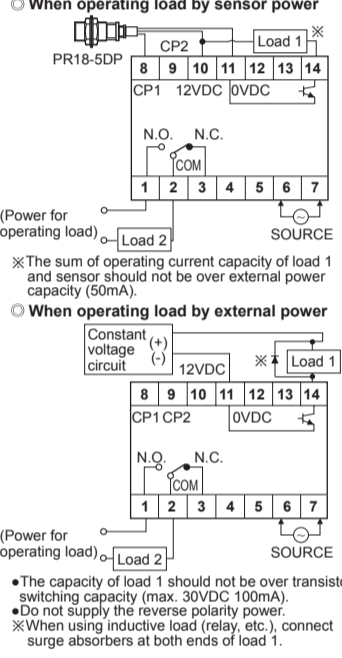
Model	1-stage setting 2-stage setting Indicator	FM4M-1P4 FM4M-2P4 FM4M-14	FM6M-1P4 FM6M-2P4 FM6M-14
Display digit	4-digit		
Character size (W×H)	6×10mm		
Power supply	100-240VAC ~ 50/60Hz		
Permissible voltage range	90 to 110% of rated voltage		
Power consumption	•1-stage: max. 4.6VA •2-stage: max. 5.8VA •Indicator: max. 3.8VA		
Max. counting speed of CP1/CP2	Selectable 1cps/30cps/300cps/2kcps/5kcps		
Return time	Max. 500ms		
Min. signal width	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, open-circuit impedance: min. 100kΩ		
One-shot output time	0.01 to 99.99 sec		
Control output	Contact Type	•1-stage: Instantaneous SPDT (1c) •2-stage: OUT1-Instantaneous SPST (1a), OUT2-Instantaneous SPST (1a)	
	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	NPN open collector output •Load voltage: max. 30VDC= •Load current: max. 100mA •Residual voltage: max. 1VDC=	
Relay life cycle	Mechanical	Min. 5,000,000 operations	
Insulation resistance	Electrical	Min. 100,000 operations (250VAC 3A resistive load) Over 100MΩ (at 500VDC megger)	
External power supply	Max. 12VDC= ±10% 50mA		
Memory retention	Approx. 10 years (non-volatile memory)		
Dielectric strength	2,000VAC 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	300ms ² (approx. 30G) in each X, Y, Z direction for 3 times	
	Malfunction	100ms 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, RoHS		
Weight	1-stage setting 2-stage setting Indicator	Approx. 245g (approx. 180g) Approx. 265g (approx. 200g) 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



Example of Input/Output Connection

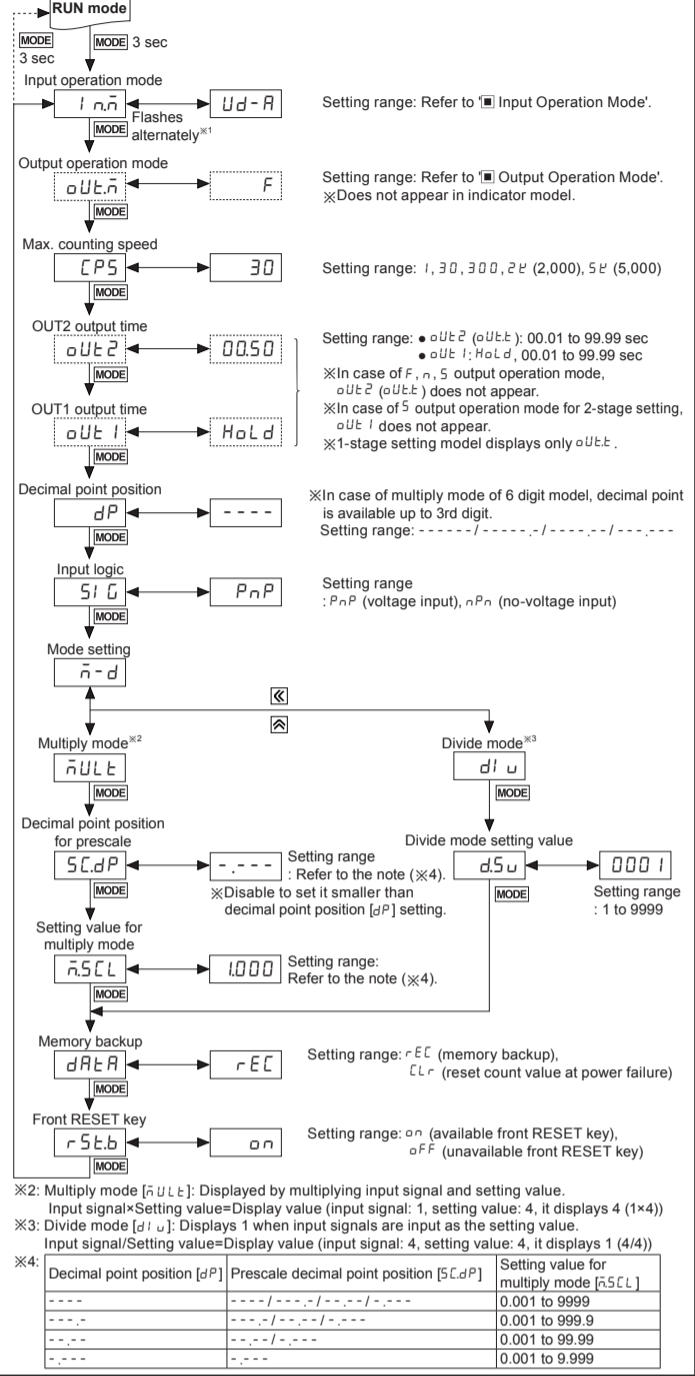


Output Operation Mode

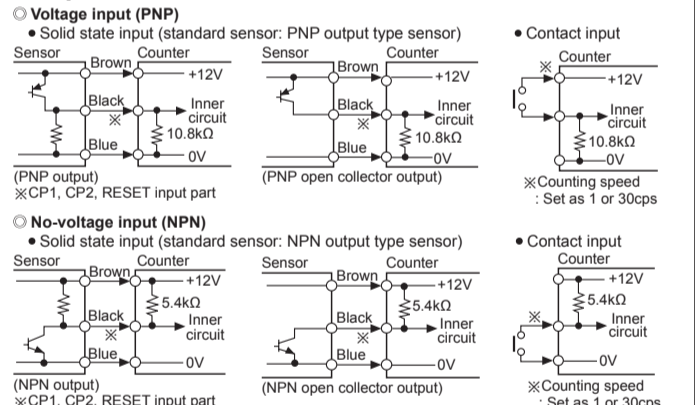
Input mode	Operation
Up, Up/Down-A, B, C	After count-up, counting display value increases or decreases until reset signal input is applied and self-holding output is maintained.
Down, Up/Down-D, E, F	After count-up, counting display value is reset and it counts simultaneously. Self-holding output of OUT1 turns OFF after one-shot output time of OUT2.
F [F]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
N [n]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
C [C]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
R [r]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
K [k]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
P [p]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
Q [q]	After count-up, counting display value is reset after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
Up	•Up, Up/Down-A, B, C input mode •OUT1 output maintains ON when counting display value is larger or equal than 1st setting value. •OUT2 output maintains ON when counting display value is larger or equal than 2nd setting value.
Down	•Down, Up/Down-D, E, F input mode •OUT1 output maintains ON when counting display value is smaller or equal than 1st setting value. •OUT2 output maintains ON when counting display value is smaller or equal than 2nd setting value.
Up/Down-A, B, C	
Up/Down-D, E, F	

Parameter Setting

- 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 returns to RUN mode with previous settings.
- Press the [OK] key 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.
- The dotted line parameters may not appear depending on output specifications or other parameter settings.
- ※1: Each parameter and corresponding setting value will flash alternately every 0.5 sec.



Input Connection



Factory Default

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
i n	Ud-A	oUt 2	0.050	Si G	P n P	n S C L	1000
oUt 1	F	oUt 1	HoLd	n-d	nULt	dREr	rEC
CP S	30	dP	---	5CLP	---	r5tb	oN

Error Display and Output Operation

Error Display	Error description	Troubleshooting
E r r 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.

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 (1 cps or 30 cps) to operate. If set to high speed mode (300cps, 2kcps, 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.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000m
 - Pollution degree 2
 - Installation category II

Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Slide 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, 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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