

FXH/FXM Series

DIN W72×H72, W48×H96mm Counter/Timer

■ Features

- Counting speed: 1cps / 30cps / 2kcps / 5kcps
- Selectable voltage input (PNP) method or no-voltage input (NPN) method
- Input mode: Up, Down, Up/Down
- Power supply: 100-240VAC 50/60Hz
- Dot for Decimal Point / Hour. Min. Second by RESET key
- Selectable Counter/Timer by internal DIP switch
- [Counter]
20 input modes/18 output modes
- [Timer]
16 output modes
- Various time setting range - 8-digit model: 0.01 sec to 99999 hour 59.9 min /
6-digit model: 0.1 sec to 99999.9 hour /
4-digit model: 0.01 sec to 9999 hour
- Output: Indicator, 1-stage setting, 2-stage setting



⚠ Please read "Safety Considerations" in the instruction manual before using.



■ Ordering Information


FX	4	H	-	2P	4	
Item	Display digit	Size	Output	Power supply		
	4	H	1P	4		100-240VAC 50/60Hz
	6	M	2P			1-stage setting
	8		I			2-stage setting
						Indicator
						DIN W48×H96mm
						DIN W72×H72mm
						9999 (4-digit)
						999999 (6-digit)
						99999999 (8-digit)
						Counter/Timer

■ Specifications

Model	1-stage setting	FX4H-1P4	FX4M-1P4	FX6M-1P4	FX8M-1P4
	2-stage setting	FX4H-2P4	FX4M-2P4	FX6M-2P4	—
	Indicator	—	FX4M-I4	FX6M-I4	FX8M-I4
Display digit		4-digit		6-digit	8-digit
Character size (W×H)		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		2,000VAC 50/60Hz for 1 min (between all terminals and case)			
Noise immunity		±2KV the square wave noise (pulse width 1μs) by noise simulator			

Up/Down Counter/Timer

Specifications

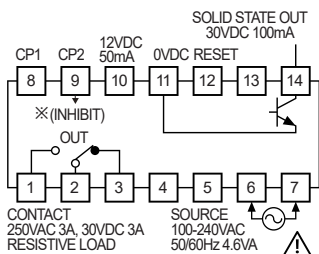
Model	1-stage setting	FX4H-1P4	FX4M-1P4	FX6M-1P4	FX8M-1P4
	2-stage setting	FX4H-2P4	FX4M-2P4	FX6M-2P4	—
	Indicator	—	FX4M-I4	FX6M-I4	FX8M-I4
Vibration	Mechanical	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour			
	Malfunction	0.5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min			
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  us				
Weight ^{※1}	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.

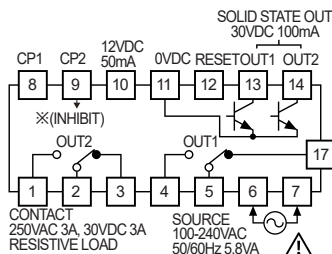
※Environment resistance is rated at no freezing or condensation.

Connections

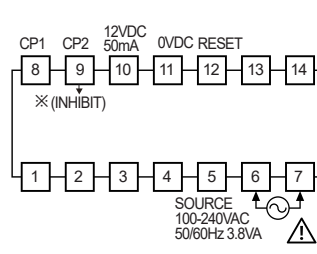
FX□M-1P4



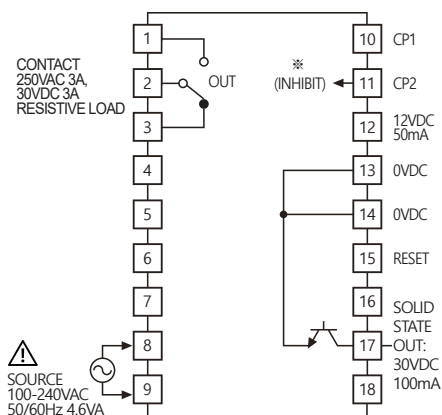
FX□M-2P4



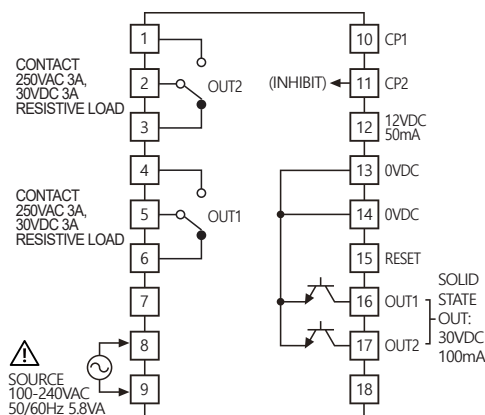
FX□M-I4



FX4H-1P4



FX4H-2P4



※INHIBIT: In case of timer mode, this terminal is for time hold.

(voltage input (PNP): connect with 12VDC, no-voltage input (NPN): connect with 0VDC)

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CONTROLLERS
MOTION DEVICES
SOFTWARE

(J) Temperature Controllers

(K) SSRs

(L) Power Controllers

(M) Counters

(N) Timers

(O) Digital Panel Meters

(P) Indicators

(Q) Converters

(R) Digital Display Units

(S) Sensor Controllers

(T) Switching Mode Power Supplies

(U) Recorders

(V) HMIs

(W) Panel PC

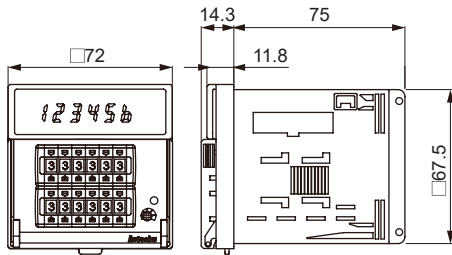
(X) Field Network Devices

FXH/FXM Series

Dimensions

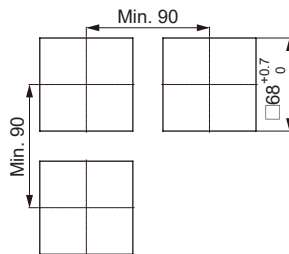
(unit: mm)

FXM Series

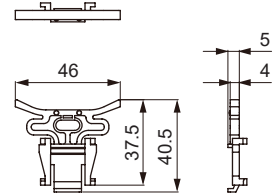


Panel cut-out

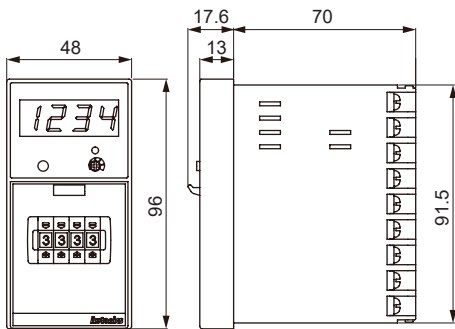
FXM Series



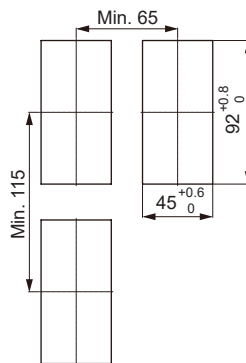
Bracket (FXM, FXH Series universal)



FXH Series



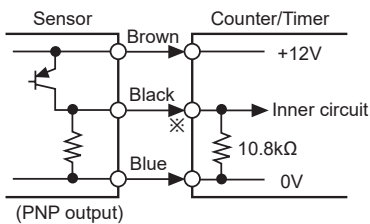
FXH Series



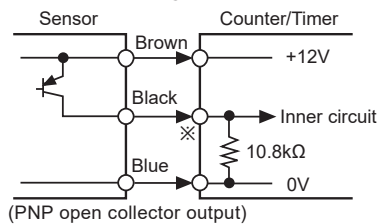
Input Connections

Voltage input (PNP)

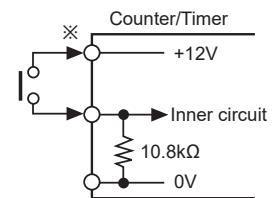
Solid-state input (standard sensor: PNP output type sensor)



※CP1, CP2 (INHIBIT), RESET input part



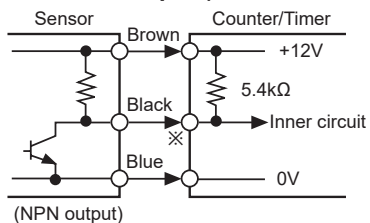
Contact input



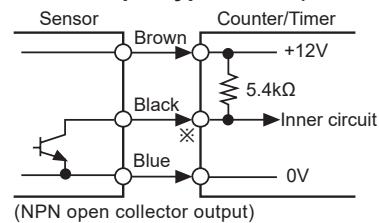
※ Counting speed
: Set as 1 or 30cps

No-voltage input (NPN)

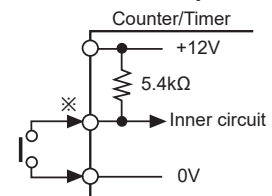
Solid-state input (standard sensor: NPN output type sensor)



※CP1, CP2 (INHIBIT), RESET input part



Contact input

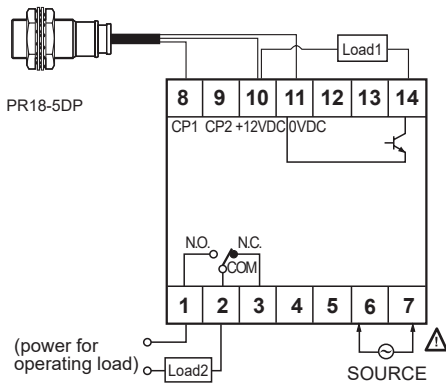


※ Counting speed
: Set as 1 or 30cps

Up/Down Counter/Timer

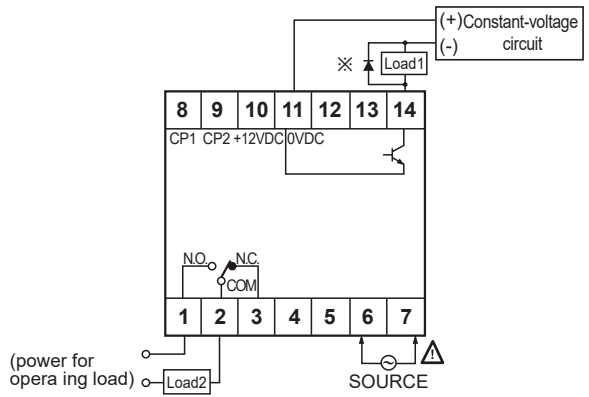
Input & Output Connections

When operation load by sensor power



- The sum of operating current capacity of load 1 and sensor should not be over external power capacity (50mA).

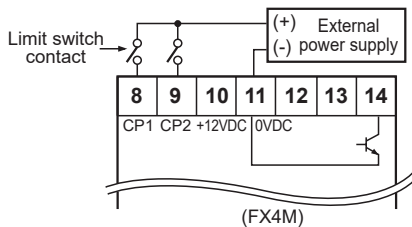
When operating load by external power



- The capacity of load 1 should not be over transistor switching capacity (max. 30VDC, 100mA)
- Do not supply the reverse polarity power.
- ※when using inductive load (relay, etc.), connector surge absorber at both ends of the load 1

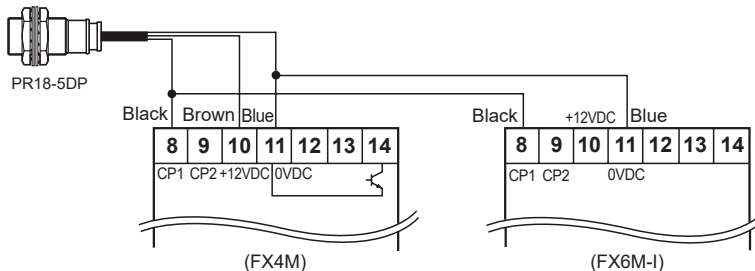
How to count by external power supply

This unit starts to count when [H] (5-30VDC) is applied at CP1 or CP2 after selecting PNP.



Using 2 counters with one sensor

Please connect as the power of sensor is supplied from only one of counters and design input logic with same way.



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MOTION DEVICES

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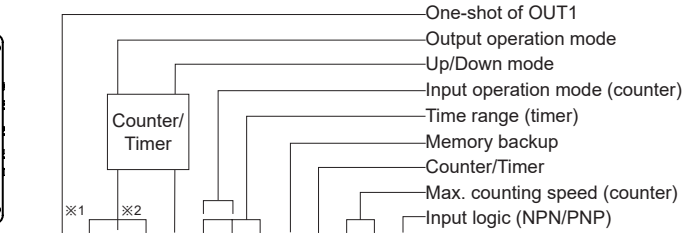
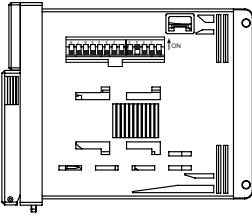
(W) Panel PC

(X) Field Network Devices

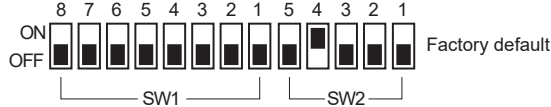
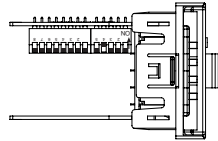
FXH/FXM Series

■ DIP Switch Setting

○ FXM Series



○ FXH Series



※1: Only 2-stage setting model has no. 8 of SW1.
 ※2: Indicator model does not have no. 5, 6, 7, 8 of SW1.

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

SW2	Function
ON OFF <input type="checkbox"/>	NPN (no-voltage input)
ON OFF <input type="checkbox"/>	PNP (voltage input)

● Max. counting speed (counter)

SW2	ON OFF <input type="checkbox"/>	ON OFF <input type="checkbox"/>	ON OFF <input type="checkbox"/>	ON OFF <input type="checkbox"/>
Function	1cps	30cps	2kcps	5kcps

● Counter/Timer

SW2	Function
ON OFF <input type="checkbox"/>	Counter mode
ON OFF <input type="checkbox"/>	Timer mode

● Memory backup

SW2	Function
ON OFF <input type="checkbox"/>	No memory backup
ON OFF <input type="checkbox"/>	Memory backup

● Up/Down mode

SW1	Function
ON OFF <input type="checkbox"/>	Down mode
ON OFF <input type="checkbox"/>	Up mode

● Time range (timer)

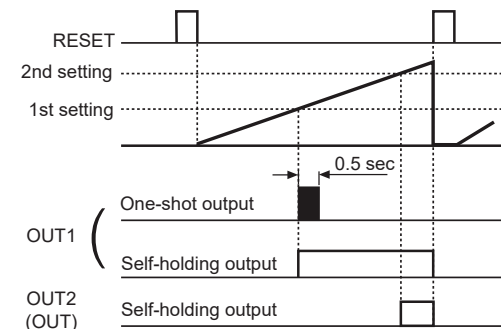
SW1	4-digit	6-digit	8-digit
ON OFF <input type="checkbox"/>	99.99 sec	99999.9 sec	999999.99 sec
ON OFF <input type="checkbox"/>	999.9 sec	999999 sec	9999999.9 sec
ON OFF <input type="checkbox"/>	9999 sec	99 min 59.99 sec	99999999 sec
ON OFF <input type="checkbox"/>	99 min 59 sec	999 min 59.9 sec	99999 min 59.9 sec
ON OFF <input type="checkbox"/>	999.9 min	99999.9 min	9999999.9 min
ON OFF <input type="checkbox"/>	99 hour 59 min	99 hour 59 min 59.9 sec	999 hour 59 min 59.9 sec
ON OFF <input type="checkbox"/>	999.9 hour	9999 hour 59 min	9999 hour 59 min 59 sec
ON OFF <input type="checkbox"/>	9999 hour	99999.9 hour	99999 hour 59.9 min

● One-shot output of OUT1

SW1	Function
ON OFF <input type="checkbox"/>	One-shot output of OUT1
ON OFF <input type="checkbox"/>	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



※ How to change settings

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

Up/Down Counter/Timer

Input Operation Mode (Counter)

※CP: Clock Pulse

Input mode		SW1	Voltage input (PNP) method	No-voltage input (NPN) method	
Up mode	Up/Down-A (command input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
	Up/Down-B (individual input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
	Up/Down-C (phase difference input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
Up mode	Up (adding input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
		ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
Down mode	Up/Down-D (command input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
	Up/Down-E (individual input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
	Up/Down-F (phase difference input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2			
	Down (subtracting input)	Down (subtracting input)	ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2		
			ON <input type="checkbox"/> 3 OFF <input checked="" type="checkbox"/> 2		

※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).

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FXH/FXM Series

Output Operation Mode

		 One-shot output of OUT2 (0.05 to 5 sec)	 Self-holding output	 One-shot output of OUT1 (0.5 sec fixed)	 Self-holding output
Output mode (SW1)	ON OFF Up mode			ON OFF Down mode	Operation
	Up, Up/Down-A, B, C			Down, Up/Down-D, E, F	
F	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value increases or decreases until reset signal input is applied and self-holding output is maintained.
N	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value and self-holding output are maintained until reset signal input is applied.
C	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	When 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. One-shot output time of OUT1 is regardless of OUT2 output.
R	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value is reset after one-shot output time of OUT2 and it counts simultaneously. Self-holding output of OUT1 turns OFF after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
K	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value increases or decreases until reset signal input is applied. Self-holding output of OUT1 turns OFF after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
P	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value is maintained while OUT2 output is ON. Counting value is internally reset and it counts simultaneously. When OUT2 output is OFF, displays counting value while OUT2 output is ON, and it increases or decreases. Self-holding output of OUT1 turns OFF after one-shot output time of OUT2.
Q	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	After count-up, counting display value increases or decreases during one-shot time of OUT2. Self-holding output of OUT1 turns OFF after one-shot output time of OUT2. One-shot output time of OUT1 is regardless of OUT2 output.
S	Up			Down	
Counter mode	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	<ul style="list-style-type: none"> 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, 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	
Timer mode	RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)			RESET 2nd setting 1st setting 0 OUT1 OUT2 (OUT)	OUT1 and OUT2 turns OFF→ON→OFF repeatedly (flicker).

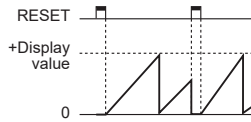
※Set one-shot output time by front TIME volume switch.

Up/Down Counter/Timer

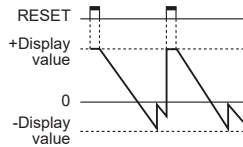
Counting & Time Operation For Indicator (FX□M-I4)

Counting operation

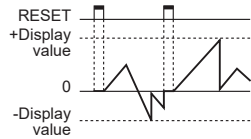
Input mode: Up



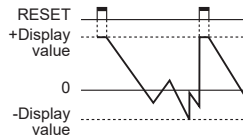
Input mode: Down



Input mode: Up / Down-A, B, C

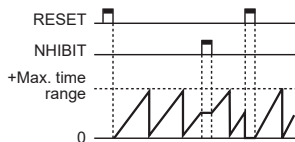


Input mode: Up / Down-D, E, F

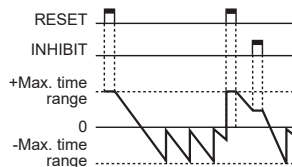


Time operation

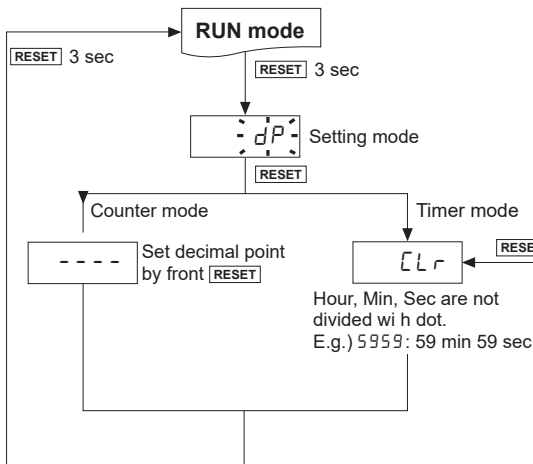
Up mode



Down mode



Dot for Decimal Point / Hour, Min, Sec



※In run mode, hold the [RESET] key for over 3 sec, and it enters setting mode [dP].

※In setting mode, hold the [RESET] key for over 3 sec, and it saves the setting and returns to RUN mode.

※If there is no [RESET] key input for 60 sec when entering setting mode, it returns to RUN mode.

Hour, Min, Sec are not divided with dot.
E.g.) 5959 : 59 min 59 sec

Hour, Min, Sec are divided with dot.
E.g.) 059.59 : 59 min 59 sec

Error Display and Output Operation

Error Display	Error description	Troubleshooting
Err0	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.

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FXH/FXM Series

■ Proper Usage

- Follow instructions in 'Proper Usage'. 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