

Autonics COUNTER / TIMER FXS 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.
 - ※Safety considerations are categorized as follows.
 - 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.
 - ※The symbols used on the product and instruction manual represent the following
 - ⚠ symbol represents caution due to special circumstances in which hazards may occur.
- 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.
 - 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.

Model

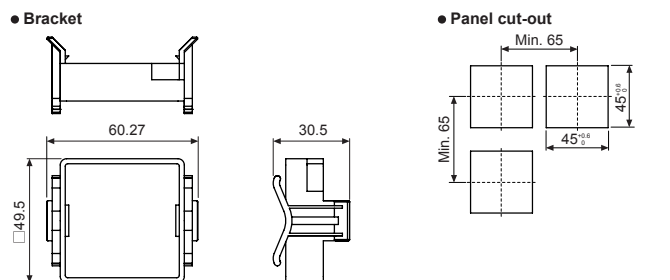
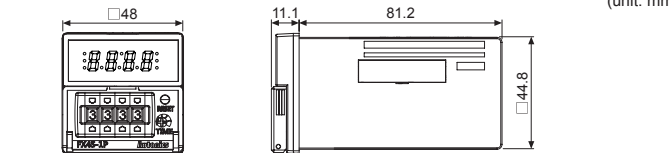
Model	Display digit	Size	Output	Power supply
FX4S-1P2	9999	DIN W48×H48mm	1-stage setting	24VAC 50/60Hz, 24-48VDC
FX4S-1P4	(4-digit)			100-240VAC 50/60Hz
FX5S-12	99999	DIN W48×H48mm	Indicator	24VAC 50/60Hz, 24-48VDC
FX5S-14	(5-digit)			100-240VAC 50/60Hz

Specifications

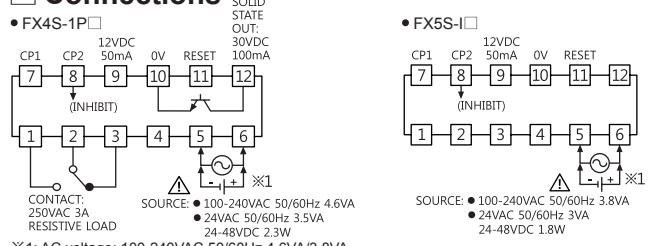
Model	1-stage setting	FX4S-1P2	FX4S-1P4	FX5S-12	FX5S-14
Display digit	Indicator	4-digit	4-digit	5-digit	5-digit
Character size (W×H)		3.8×7.6mm	3.8×7.6mm	4×8mm	4×8mm
Power supply		24VAC~50/60Hz, 24-48VDC	100-240VAC~50/60Hz	24VAC~50/60Hz, 24-48VDC	100-240VAC~50/60Hz
Permissible voltage range		90 to 110% of rated voltage			
Power consumption		AC: Max. 3.5VA, DC: Max. 2.3W	Max. 4.6VA	AC: Max. 3VA, DC: Max. 1.8W	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 input: 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		0.05 to 5 sec			
Control output	Contact	Type	Instantaneous SPDT (1c)		
	Solid state	Type	NPN open collector: 1		
		Capacity	Max. 30VDC= 100mA		
Relay life cycle	Mechanical		Min. 5,000,000 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	AC voltage		±2kV the square wave noise (pulse width 1μs) by noise simulator		
	AC/DC voltage		±500V 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			Approx. 171g (approx. 110g) Approx. 156g (approx. 95g)		

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

Dimensions



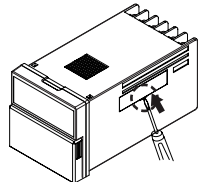
Connections



- ※1: AC voltage: 100-240VAC 50/60Hz 4.6VA/3.8VA
- AC/DC voltage: 24VAC 50/60Hz 3.5VA/3VA, 24-48VDC 2.3W/1.8W
- ※INHIBIT: In case of timer mode, this terminal is for time hold. (voltage input (PNP): connect with 12VDC, non-voltage input (NPN): connect with 0VDC)
- ※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).

Detaching DIP Switch Cover

※Turn OFF the power before detaching the DIP switch cover.



Push and pull the groove of DIP switch cover with a flat head driver to the front. The cover is detached from the case.
 ⚠ Be sure not to be wounded when using a tool.

Input Operation Mode (Counter)

※CP: Clock Pulse

Input mode	SW1	Voltage input (PNP) method	No-voltage input (NPN) method
Up/Down-A (command input)	ON OFF		
Up/Down-B (individual input)	ON OFF		
Up/Down-C (phase difference input)	ON OFF		
Up (adding 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 (subtracting input)	ON OFF		

※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).

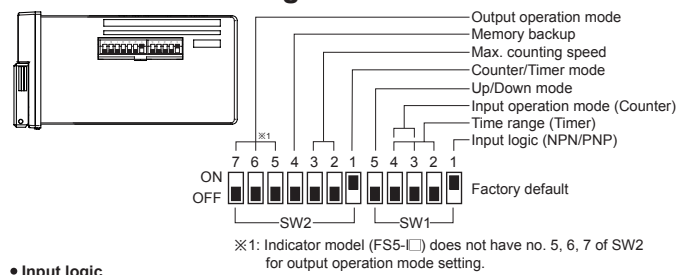
Output Operation Mode

One-shot output (0.05 to 5 sec) Self-holding output

Output mode (SW2)	Up mode	Down mode	Operation
F	Setting:	Setting:	After count-up, counting display value increases or decreases until reset signal input is applied and self-holding output is maintained.
N	Setting:	Setting:	After count-up, counting display value and self-holding output are maintained until reset signal input is applied.
C	Setting:	Setting:	When count-up, counting display value is reset and it counts simultaneously.
R	Setting:	Setting:	After count-up, counting display value is reset after one-shot output time and it counts simultaneously.
K	Setting:	Setting:	After count-up, counting display value increases or decreases until reset signal input is applied.
P	Setting:	Setting:	After count-up, counting display value is maintained while output is ON. Counting value is internally reset and it counts simultaneously.
Q	Setting:	Setting:	After count-up, counting display value increases or decreases during one-shot output time.
S	Setting:	Setting:	Up, Up/Down-ABC input mode: Output maintains ON when counting display value is larger or equal than setting value. Down, Up/Down-D, E, F input mode: Output maintains ON when counting display value is smaller or equal than setting value.
S	Setting:	Setting:	Output turns OFF → ON → OFF repeatedly (flicker).

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

DIP Switch Setting



※1: Indicator model (FX5S-1□) does not have no. 5, 6, 7 of SW2 for output operation mode setting.

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

SW1	Function
ON OFF	NPN (no-voltage input)
ON OFF	PNP (voltage input)

Up/Down mode

SW1	Function
ON OFF	Down mode
ON OFF	Up mode

Counter/Timer mode

SW2	Function
ON OFF	Counter mode
ON OFF	Timer mode

Memory backup

SW2	Function
ON OFF	No memory backup
ON OFF	Memory backup

Max. counting speed

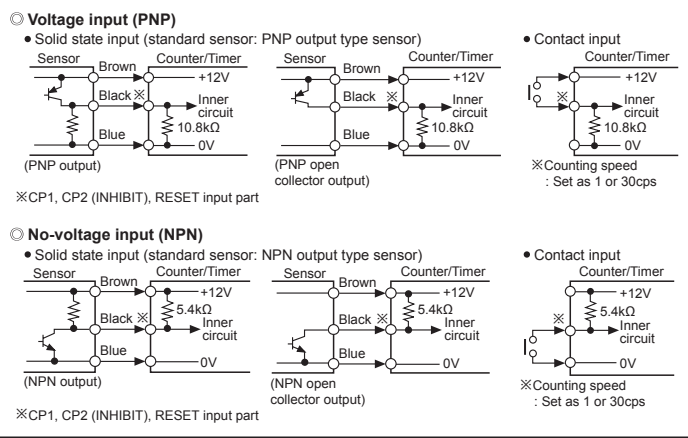
SW2	Function	1cps	30cps	2kcps	5kcps
ON OFF	ON OFF	ON OFF	ON OFF	ON OFF	ON OFF

Time range (timer)

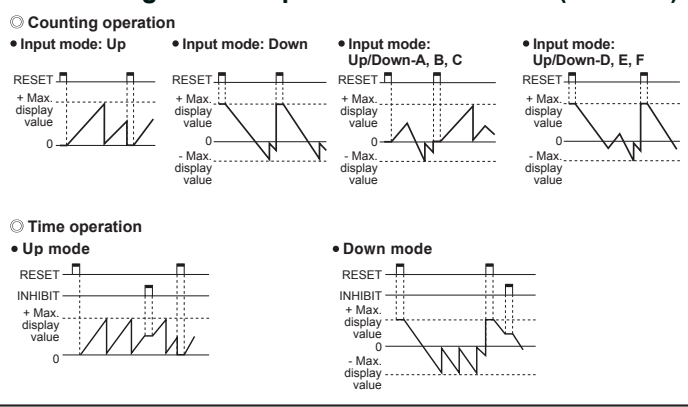
SW1	Function	FX4S-1P□	FX5S-1□
ON OFF	ON OFF	99.99sec	9999.9sec
ON OFF	ON OFF	999.9sec	99999sec
ON OFF	ON OFF	9999sec	9min 59.99sec
ON OFF	ON OFF	99min 59sec	99min 59.9sec
ON OFF	ON OFF	999.9min	9999.9min
ON OFF	ON OFF	99hour 59min	99hour 59min 59sec
ON OFF	ON OFF	9999hour	9999hour 59min

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

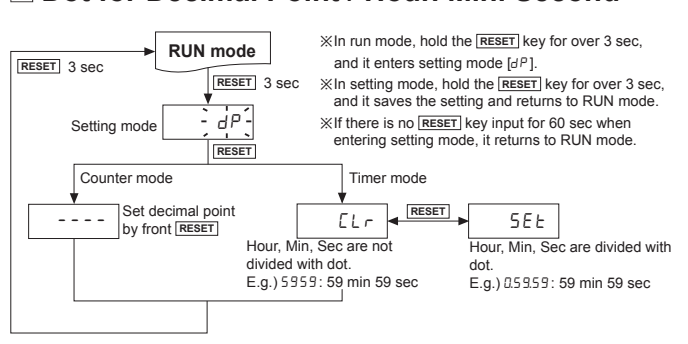
Input Connection



Counting & Time Operation for Indicator (FX5S-1□)



Dot for Decimal Point / Hour. Min. Second



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.
 ※Indicator model does not have error display function.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 24-48VDC, 24VAC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- 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.
 - ①Indoors (in the environment condition rated in 'Specifications')
 - ②Altitude max. 2,000m
 - ③Pollution degree 2
 - ④Installation category II

Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- Field Network Devices
- 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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