Autonics

8-PIN PLUG TYPE COUNTER
FS 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

1. **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 personal injury, fire, or economic loss.
2. **The unit must be installed on a device panel before use.**
   Failure to follow this instruction may result in electric shock.
3. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in electric shock.
4. **Do not disassemble or modify the unit. Please contact us if necessary.**
   Failure to follow this instruction may result in electric shock or fire.

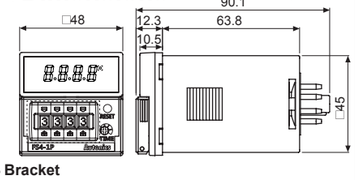
⚠ Caution

1. **Do not use the unit outdoors.**
   Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
2. **When connecting the power input or relay output cables, make sure to use AWG 20 (0.50mm^2) cables and make sure to tighten the terminal screw bolt above 0.74 to 0.90N·m.**
   Failure to follow this instruction may result in fire due to contact failure.
3. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
4. **Do not use loads beyond the rated switching capacity of the relay contact.**
   Failure to follow this instruction may result in insulation failure, contact melt, contact failure, relay broken, or fire.
5. **Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**
   Failure to follow these instructions may result in electric shock or fire.
6. **Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, and impact may be present.**
   Failure to follow this instruction may result in fire or explosion.
7. **Keep dust and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.

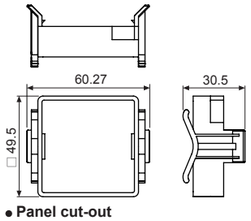
※**The above specifications are subject to change and some models may be discontinued without notice.**

■ Dimensions

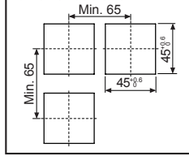
(unit: mm)



● **Bracket**

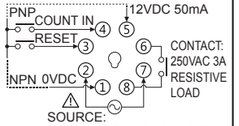


● **Panel cut-out**

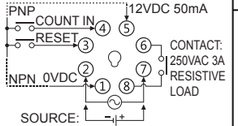


■ Connections

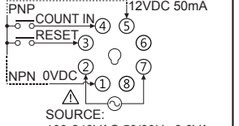
● **FS4-1P4**



● **FS4-1P2**



● **FS5-I4**



■ Model

Model	Display digit	Size	Output	Power supply
FS4-1P2	9999 (4-digit)	DIN W48×H48mm	1-stage setting	24VAC 50/60Hz, 24-48VDC⎓
FS4-1P4				100-240VAC 50/60Hz
FS5-I4	99999 (5-digit)		Indicator	100-240VAC 50/60Hz

※Sockets (PG-08, PS-08(N)) are sold separately.

■ Specifications

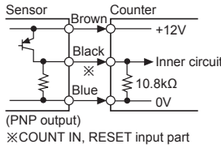
Model		FS4-1P2	FS4-1P4	—
	1-stage setting			
	Indicator	—	—	FS5-I4
Display digit		4-digit		5-digit
Character size (W×H)		3.8×7.6mm		4×8mm
Power supply		24VAC~ 50/60Hz, 24-48VDC⎓	100-240VAC~ 50/60Hz	
Permissible voltage range		90 to 110% of rated voltage		
Power consumption		Max. 3.5VA (24VAC~ 50/60Hz), Max. 2.3W (24-48VDC⎓)	Max. 4.6VA (100-240VAC~ 50/60Hz)	Max. 3.8VA (100-240VAC~ 50/60Hz)
Max. counting speed for COUNT IN		Selectable 1cps/30cps/2kcps/5kcps (DIP switch)		
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, 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 SPST (1a)		—
	Contact: Capacity	250VAC~ 3A resistive load		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations (250VAC 3A resistive load)		
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℃, storage: -25 to 65℃		
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH		
Protection structure		IP20 (front part, IEC standard)		
Approval		CE cULus		
Weight※1		Approx. 120g (approx. 90g)		Approx. 120g (approx. 80g)

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

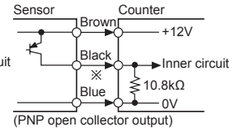
■ Input Connection

◎ **Voltage input (PNP)**

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

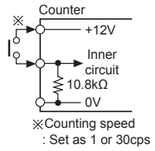


(PNP output)
※COUNT IN, RESET input part



(PNP open collector output)

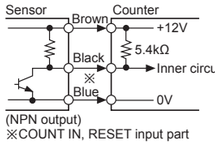
● Contact input



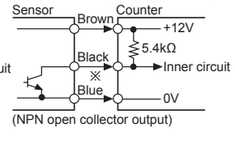
※Counting speed
: Set as 1 or 30cps

◎ **No-voltage input (NPN)**

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

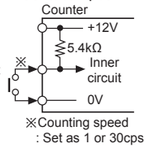


(NPN output)
※COUNT IN, RESET input part



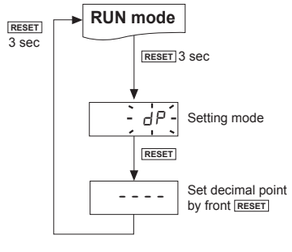
(NPN open collector output)

● Contact input



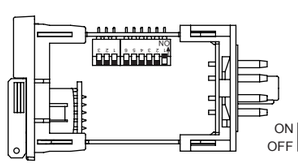
※Counting speed
: Set as 1 or 30cps

■ Dot for Decimal Point



※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.

■ DIP Switch Setting



※1: Indicator model (FS5-I4) does not have no. 1, 2, 3 DIP switch of SW2 for output operation mode setting.

● **Input logic (COUNT IN, RESET input)**

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

● **Up/Down mode**

SW1		Function
2	ON / OFF	Down mode
	ON / OFF	Up mode

● **Memory backup**

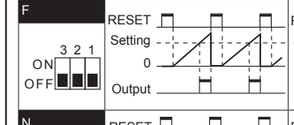
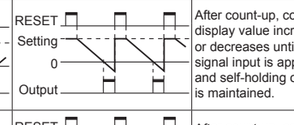
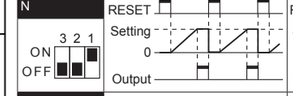
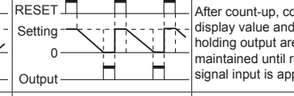
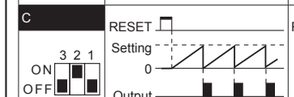
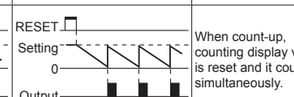
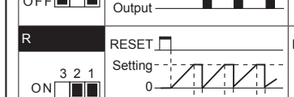
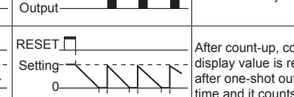
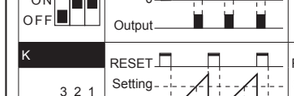
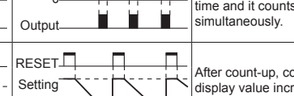
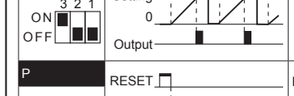
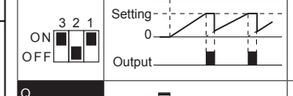
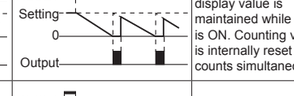
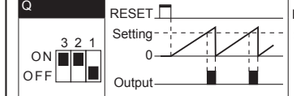
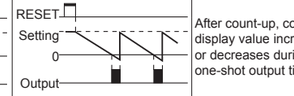
SW1		Function
6	ON / OFF	No memory backup
	ON / OFF	Memory backup

● **Max. counting speed**

SW1	Function
5 4 ON / OFF	1cps
5 4 ON / OFF	30cps
5 4 ON / OFF	2kcps
5 4 ON / OFF	5kcps

■ Output Operation Mode

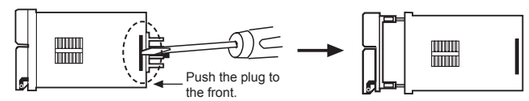
■ ← One-shot output (0.05 to 5 sec) □ ← Self-holding output

Output mode (SW2)	SW1 ON/OFF 2 Up mode	SW1 ON/OFF 2 Down mode	Operation
F			After count-up, counting display value increases or decreases until reset signal input is applied and self-holding output is maintained.
N			After count-up, counting display value and self-holding output are maintained until reset signal input is applied.
C			When count-up, counting display value is reset and it counts simultaneously.
R			After count-up, counting display value is reset after one-shot output time and it counts simultaneously.
K			After count-up, counting display value increases or decreases until reset signal input is applied.
P			After count-up, counting display value is maintained while output is ON. Counting value is internally reset and it counts simultaneously.
Q			After count-up, counting display value increases or decreases during one-shot output time.
S			Output maintains ON when counting display value is larger or equal than setting value.

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

■ Detaching Case

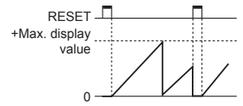
※Turn OFF the power before detaching the case.



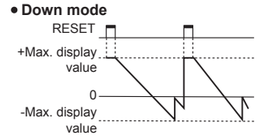
Push the grooves at both side of the unit with a flat head driver to the outside and push the plug part to the front. The plug is detached.
⚠ Be sure not to be wounded when using a tool.

■ Counting Operation for Indicator (FS5-I4)

● **Up mode**



● **Down mode**



※- display is only for F, K, Q, S output operation mode and it cannot be set.

■ Cautions During Use

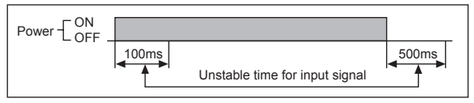
1. DIP switch setting
Turn OFF the power before setting the DIP switch to the Counter.
After DIP switch setting when cutting off the power, press the front RESET key or supplying the external reset.

2. Error

Display	Error	Troubleshooting
Err0	Setting value is 0.	Change the setting value anything but 0.

※If error occurs, the output turns OFF.
※Indicator model does not have error display function.

3. Power
①In case of 24VAC, 24-48VDC model, power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
②The inner circuit voltage rises within 100ms after supplying the power to the unit.
The input may be unavailable at this period.
Be sure that the inner circuit voltage drops within 500ms after turning OFF the power.



③Use the unit within the rated power supply.
When supplying or cutting the power, use a switch not to occur chattering.

4. Input signal line
①Shorten the cable from the sensor to the unit.
②Use shield cable when input cable is longer.
③Wire the input signal line separately from power line.

5. Testing dielectric voltage or insulation resistance when the unit is installed at control panel
①Isolate the unit from the circuit of control panel.
②Short all terminals of the unit.

6. Do not use the unit in the following environments.
①Environments with high vibration or shock.
②Environments with strong alkali or strong acid materials
③Environments with exposure to direct sunlight
④Near machinery which produces strong magnetic force or electric noise

7. This product may be used in the following environments.
①Indoor
②Altitude max. 2,000m
③Pollution degree 2
④Installation category II

※**Failure to follow these instructions may result in product damage.**

■ 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
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, Co$_2$, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

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