

## DIN W48×H48mm 8 Pin Plug Counter

### ■ Features

- Upgraded counting speed: 1cps / 30cps / 2kcps / 5kcps
- Selectable voltage input (PNP) method or no-voltage input (NPN) method
- Decimal point setting (fixed decimal point of display)
- Wide range of power supply  
: 100-240VAC 50/60Hz, 24VAC 50/60Hz, 24-48VDC universal
- Memory protection for 10years (using non-volatile semiconductor)
- Selectable Up/Down for counting value
- Built-in Microprocessor

⚠ Please read "Safety considerations" in operation manual before using.



### ■ Ordering Information

FS	4	-	1P	4	
Item	Display digit	Output	Power supply		
	4	1P	2	24VAC 50/60Hz, 24-48VDC	
	5	I	4	100-240VAC 50/60Hz	
			1P	1-stage setting	
			I	Indicator	
			4	9999 (4-digit)	
			5	99999 (5-digit)	
			FS	8-pin plug counter	

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

### ■ Specifications

Model	1-stage setting	FS4-1P2	FS4-1P4	—
	Indicator	—	—	FS5-14
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)		
	Capacity	250VAC~ 3A resistive load		
Relay life cycle	Mechanical	Min. 5,000,000 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 <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times		
	Malfunction	100m/s <sup>2</sup> (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 c UL US		
Weight <sup>※1</sup>		Approx. 130g (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.

Upgrade

Shaded parts(■) are changed and added functions from previous FS Series.



(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/  
Connector Cables/  
Sensor Distribution  
Boxes/Sockets

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

(R) Graphic/ Logic Panels

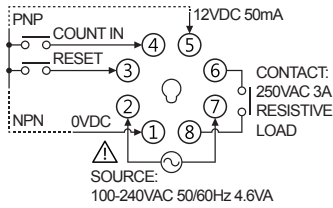
(S) Field Network Devices

(T) Software

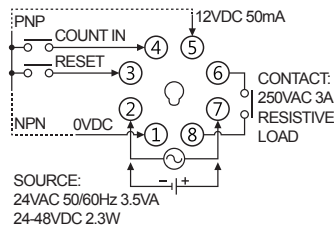
# FS Series

## Connections

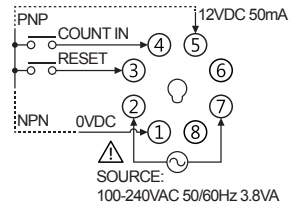
### ● FS4-1P4



### ● FS4-1P2



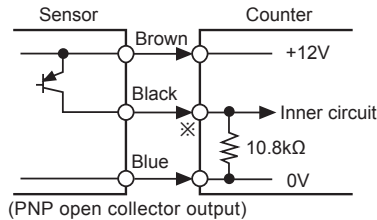
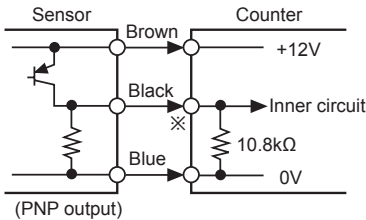
### ● FS5-I4



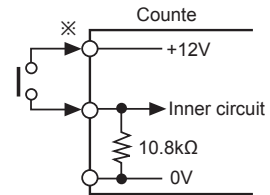
## Input Connections

### ○ Voltage input (PNP)

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



#### ● Contact input

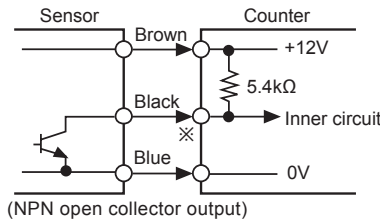
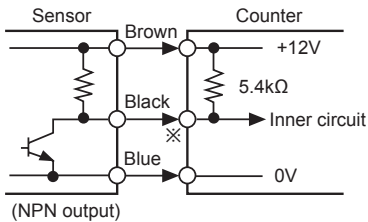


※ Counting speed  
: Set as 1 or 30cps

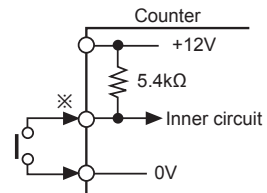
※COUNT IN, RESET input part

### ○ No-voltage input (NPN)

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



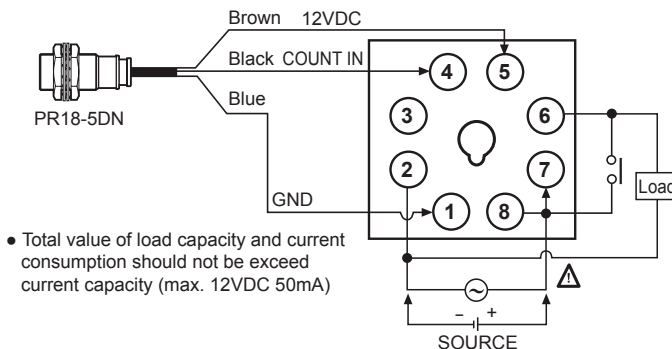
#### ● Contact input



※ Counting speed  
: Set as 1 or 30cps

※COUNT IN, RESET input part

### ○ Input & output connections



● Total value of load capacity and current consumption should not be exceed current capacity (max. 12VDC 50mA)

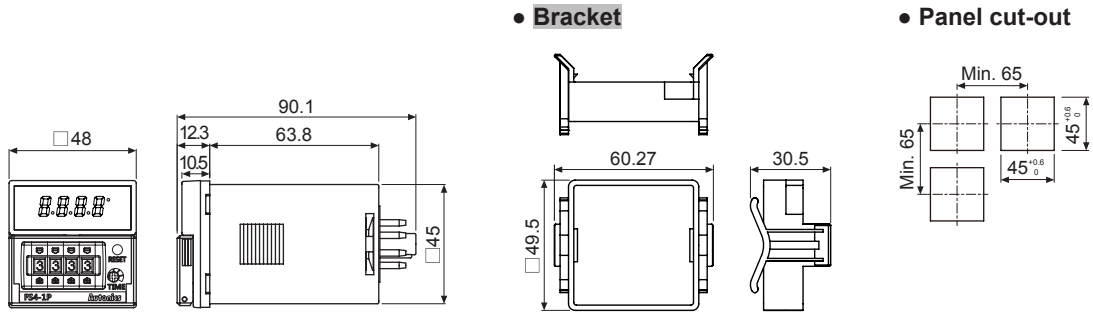
● Please select proper capacity of load not to exceed contact capacity.  
Contact capacity: max. 250VAC 3A  
Contact type: 1a

# 8 Pin Plug Type Counter

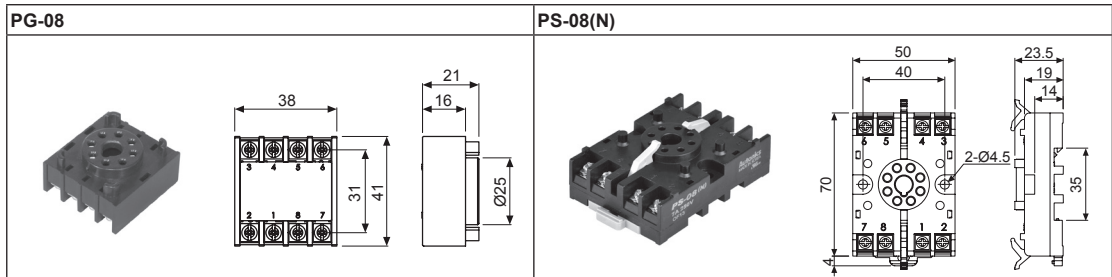
## ■ Dimensions

※Nameplate design is changed and rear length is shorten than previous.

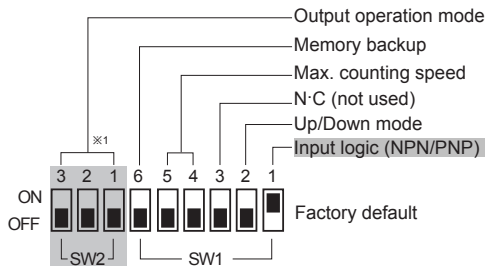
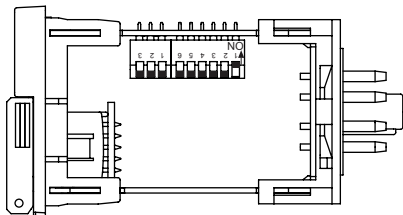
(unit: mm)



## ● Socket (sold separately)



## ■ DIP Switch Setting



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

SW1	Function	
1	ON <input type="checkbox"/> OFF <input type="checkbox"/>	NPN (no-voltage input)
	ON <input type="checkbox"/> OFF <input type="checkbox"/>	PNP (voltage input)

### ● Up/Down mode

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

### ● Memory backup

SW1	Function	
6	ON <input type="checkbox"/> OFF <input type="checkbox"/>	No memory backup
	ON <input type="checkbox"/> OFF <input type="checkbox"/>	Memory backup

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

### ● Max. counting speed

SW1	Function	
5 4	ON <input type="checkbox"/> OFF <input type="checkbox"/>	1cps
	ON <input type="checkbox"/> OFF <input type="checkbox"/>	30cps
5 4	ON <input type="checkbox"/> OFF <input type="checkbox"/>	2kcps
	ON <input type="checkbox"/> OFF <input type="checkbox"/>	5kcps

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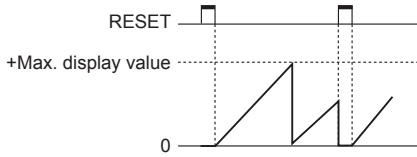
(R) Graphic/ Logic Panels

(S) Field Network Devices

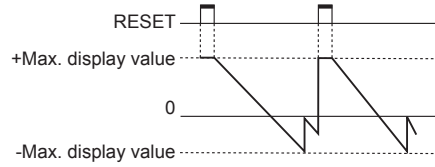
(T) Software

## 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.

## Output Operation Mode

■ ← One-shot output (0.05 to 5 sec)

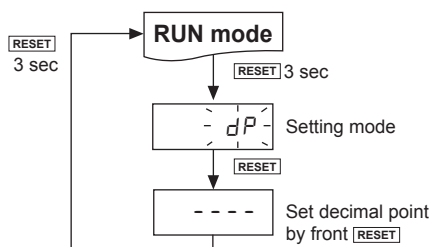
□ ← Self-holding output

Output mode (SW2)	sw1 ON OFF <input checked="" type="checkbox"/> Up mode	sw1 ON OFF <input checked="" type="checkbox"/> Down mode	Operation
<b>F</b> ON 3 2 1 OFF <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value increases or decreases until reset signal input is applied and self-holding output is maintained.
<b>N</b> ON 3 2 1 OFF <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value and self-holding output are maintained until reset signal input is applied.
<b>C</b> ON 3 2 1 OFF <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	When count-up, counting display value is reset and it counts simultaneously.
<b>R</b> ON 3 2 1 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value is reset after one-shot output time and it counts simultaneously.
<b>K</b> ON 3 2 1 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value increases or decreases until reset signal input is applied.
<b>P</b> ON 3 2 1 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value is maintained while output is ON. Counting value is internally reset and it counts simultaneously.
<b>Q</b> ON 3 2 1 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	After count-up, counting display value increases or decreases during one-shot output time.
<b>S</b> ON 3 2 1 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	RESET Setting 0 Output	RESET Setting 0 Output	Output maintains ON when counting display value is larger or equal than setting value.

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

# 8 Pin Plug Type Counter

## ■ 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.

## ■ Proper Usage

### ○ Reset function

#### ● Reset

After DIP switch setting when cutting off the power, press the front RESET key or supplying the external reset.

**If reset is not executed, the counter will be working as previous mode.**

#### ● The Reset signal width

It is reset perfectly when the reset signal is applied for max. 20ms regardless of the contact input & solid-state input.

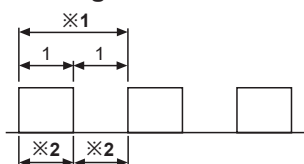


- ※1: In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during min. 20ms even though chattering occurs.
- ※2: It can be input the signal of CP1&CP2 after min. 50ms from closing time of reset signal.

### ○ Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under max. DC50mA.

### ○ Min. signal width



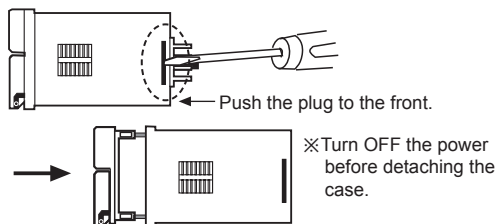
※1: Please make duty ratio (ON/OFF) 1:1.

- ※2: Min. signal width
  - 1cps: Min. 0.5sec
  - 30cps: Min. 16.7ms
  - 2kcps: Min. 0.25ms
  - 5kcps: Min. 0.1ms

### ○ Detaching Case

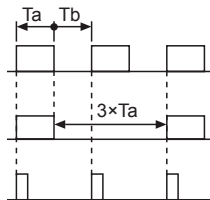
Push the grooves at both side of the unit with a flat head driver to the outside and push the plug part to the front. The plug is detached.

▲ Be sure not to be wounded when using a tool.



### ○ Max. counting speed

This is a response speed per 1 sec when the duty ratio (ON:OFF) of input signal is 1:1. If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed is getting slower against input signal. If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



Therefore Ta (ON width) and Tb (OFF width) needed to be over min. signal width.

Max. counting speed is 1/2 value of rated spec. when duty ratio is 1:3.

It can not respond if it is smaller than min. signal width (Ta).

### ○ Error

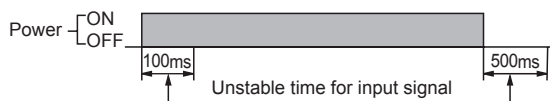
Display	Error	Troubleshooting
Err0	Setting value is 0.	Change the setting value anything but 0.

※ If error occurs, the output turns OFF.

※ Indicator model does not have error display function.

### ○ Power

- In case of 24VAC, 24-48VDC model, power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- The 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.



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



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