

Servo system Current-output type

S25P SERIES



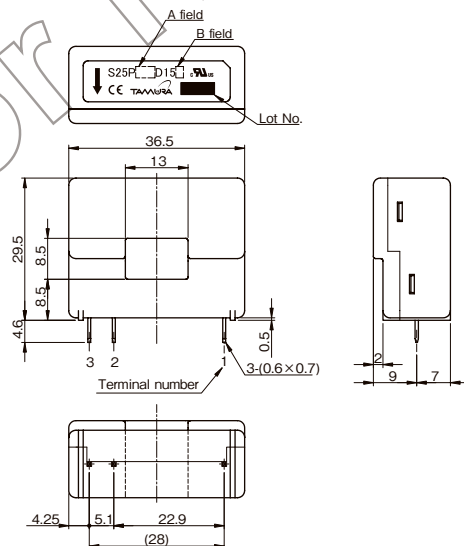
SPECIFICATIONS

Ta=25°C, Vcc=±15V

Spec	Types	S25P050D15X	S25P100D15Y	S25P100D15X	S25P150D15Y
Primary nominal current	If	50A	100A	100A	150A
Measuring resistance If= ± ADC at Ta=85°C	RL	Vcc= ± 12V 60 Ω~ 95 Ω Vcc= ± 15V 135 Ω~ 155 Ω	Vcc= ± 12V 0 Ω~ 42 Ω Vcc= ± 15V 20 Ω~ 102 Ω	Vcc= ± 12V 10 Ω~ 65 Ω Vcc= ± 15V 40 Ω~ 95 Ω	Vcc= ± 12V 0 Ω~ 15 Ω Vcc= ± 15V 0 Ω~ 55 Ω
Rated output current	Io	50mA (Turn ratio 1 : 1000)	50mA (Turn ratio 1 : 2000)	100mA (Turn ratio 1 : 1000)	75mA (Turn ratio 1 : 2000)
Output current accuracy	XG	Io ± 0.5% (without Iof)			
Offset current *1	Iof	≤ ± 0.2mA (at If=0A)	≤ ± 0.1mA (at If=0A)	≤ ± 0.2mA (at If=0A)	≤ ± 0.2mA (at If=0A)
Maximum current Vcc= ± 15V, Ta=85°C	If max	± 55A (at RL=135 Ω) *2	± 150A (at 20 Ω ≤ RL ≤ 25 Ω)	± 160A (at 40 Ω ≤ RL ≤ 50 Ω)	± 200A (at 0 Ω ≤ RL ≤ 40 Ω)
Output linearity	εL	≤ ± 0.15% (at If)			
Power supply voltage	Vcc	± 12V ± 5% ~ ± 15V ± 5% (Rated output current is restricted by Vcc)			
Consumption current	Icc	≤ ± 16mA (Without Io)			
di/dt Response time (@90% of If)	tr	≤ 1μs (at di/dt=If/μs)			
Thermal drift of gain	TCIo	≤ ± 0.01%/°C (Without TCIOF)			
Thermal drift of offset	TCIOF	≤ ± 0.5mA			
Hysteresis error	IoH	≤ 0.3mA (at If=0A → If → If=0A)			
Insulation voltage	Vd	AC3000V for 1 minute (Sensing current 0.5mA) inside of through hole ⇔ terminal			
Insulation resistance	RIIS	≥ 500MΩ (at DC500V) inside of through hole ⇔ terminal			
Ambient Operating temperature	TA	- 40°C ~ + 85°C			
Ambient storage temperature	TS	- 40°C ~ + 90°C			
Secondary coil resistance	RS	at Ta=70°C 80 Ω at Ta=85°C 85 Ω	at Ta=70°C 120 Ω at Ta=85°C 128 Ω	at Ta=70°C 25 Ω at Ta=85°C 28 Ω	at Ta=70°C 95 Ω at Ta=85°C 105 Ω

\* 1 Offset current value is after removal of core hysteresis. \* 2 Ta=70°C, If max=70A (at 50 Ω ≤ RL ≤ 90 Ω)  
\* Please refer to the another sheet about conditions of UL Recognition.

DIMENSIONS (mm)



A field display

Current	A field
50A	050
100A	100
150A	150

B field display

Coil	B field
1000T	X
2000T	Y

\* 50A is 1000T only, 150A is 2000T only

Terminal number

- 1 + Vcc
- 2 - Vcc
- 3 OUT

Weight:

20g typ

Note

- 1. Unless otherwise specified, tolerances shall be ± 0.5mm

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  - Use that involves exposure to direct sunlight, outdoor exposure, or dusty conditions.
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  - Use in environments with strong static electricity or electromagnetic radiation.
  - Use that involves placing inflammable material next to the product.
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  - Use in locations where condensation is liable to occur.
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# Application notes

## <General Considerations>

1. The sensor uses polar electronic components. When the polarity of the power supply is mistaken, the sensor is damaged.
2. Static electricity or excessive voltage can increase an offset voltage in the Hall element, and cause offset voltage to change. Please exercise care in handling and application.
3. In order to prevent the influence of noise, the use of twisted cable or shielded cable for the output line is recommended
4. If using this device within a magnetic field generated by other devices, the specified accuracy may not be obtainable.
5. Our products (several models are excluded ) are adjusted with the trimming method by the measurement condition (Load resistance, Power supply voltage) of specification sheets. Therefore, characteristics (Offset, Output, etc.) and its deviation may be changed in different circuit conditions from the measurement condition. All change characteristic items are not indicated on specification sheets.
6. The performance of current sensors with through-hole (aperture) is dependent on the position of the primary conductor. Tamura specifications are based on a primary conductor completely filling the through-hole (aperture) area.
7. The current sensor rated current in DC Amps.
8. Please use mating connector with equivalent terminal plating material to insure proper operation and avoid possibility of 'galvanic corrosion' .
9. Please do not store in high-temperature and high-humidity storage environment. Please use it after confirming soldering when it is kept for six months or more. (product soldered with substrate)
10. We recommend performing a zero offset adjustment by measuring the offset voltage at startup. In continuously operation for a few months, or at change of ambient temperature or humidity is large, we recommend regularly performing a zero offset adjustment at being idling (it is clear that the current is not apply) .
11. The current sensor doesn't have built-in protection circuit (devices and fuses, etc.). As a failure mode of the sensor, there is a short circuit and open state. In the case of a short-circuit state, the abnormal temperature rise of the internal parts is assumed, and there is a possibility to smoke and to ignite. If it is used in safety critical circuit blocks, please take appropriate measures by protection devices, protection circuits, etc. For closed loop -type sensors and flux gate (closed loop type) sensors, the consumption current of the secondary power supply varies in proportion to the measurement current.

## <Open loop>

1. High frequency primary current may result in excessive heating in iron magnetic core and cause damage to internal circuitry; for high frequency applications select current sensor with ferrite core material.
2. If the measured current exceeds the rated current, magnetic core saturation will occur and the output voltage signal will not be linearly proportional to the measured current.

## <Closed Loop>

1. For closed loop current sensors please insure the power supply voltage is balanced, symmetrical, and, applied simultaneously to avoid potential increase in DC offset error.
2. Maximum rated current measurement duration is time dependent. Maximum rated current applied in excess of the time limit can result in damage to internal electronic circuitry; please consult Tamura for assistance.
3. When using a measurement resistor to convert current output to voltage output select a resistor with stable temperature characteristic to insure accuracy of the output voltage.
4. Compensation current supplied to the secondary winding varies in proportion to the measured current based on the conversion ratio. (If/ $KN$ ;  $KN = \text{secondary turns}$ ) Please insure the PSU has required current capacity to supply compensation current to the secondary winding.

## <Flux-Gate>

1. Compensation current supplied to the secondary winding varies in proportion to the measured current. Please insure the PSU has required current capacity to supply compensation current to the secondary winding.
2. There is 450kHz ripple voltage present on the output and reference output voltage signals . An external capacitor maybe added if necessary.

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