

# SP TYPE

SP, with the inner and outer surfaces coated with a special glass, features higher thermal resistance and larger electric power capacity for the compact volume. Unlike conventional wire wound resistors, the volumetric resistor will provide superior stability versus frequency and higher durability against transient voltage. Further, SP can be water cooled, which enables the resistor to be suitable for the application with large current as well as high frequency circuit.



## TYPICAL APPLICATIONS:

Electric power circuits, dummy load, anti-parasitic oscillation circuits, PT protection, high frequency circuits, large current circuits, ultrasonic devices

## CHARACTERISTICS:

Item	SP Characteristics
Working temperature:	300°C
Temperature coefficient:	±0.15%/°C Max.
Withstand voltage: (1.2×50 μs)	0.5kV/cm Max.
Load life stability (500h)	±7 % Max.
Short time overload: (10 times of rated power for 5 sec)	±2 % Max.

Item	SP Characteristics
Bulk density:	2.0~2.4
Specific heat:	630~1250J/(kg·K)
Max operating temperature:	350°C
Short time allowable injection energy:	70J/cm <sup>3</sup> Max.

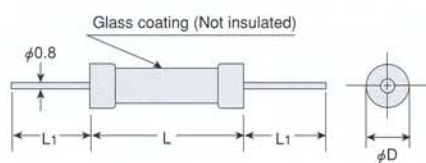
## SP STANDARD SPECIFICATIONS:

Type No.	Rated Power (W)	Dimensions (mm)				Max Allowable Impulse Voltage (kV) 1.2×50 μs	Resistance Value Range (Ω)	Allowable Injection Energy (J)
		φ D	φ d	L	L <sub>1</sub>			
ER 3SP	3	4.5±1.0	—	20±1.0	38±2	0.5	1.0~390	11
ER 5SP	5	8.5±1.0	—	25±1.0	38±2	0.5	1.0~150	63
ER 10SP	10	8.5±1.0	—	40±1.0	38±2	1.0	1.0~270	110
ER 20SP	20	14±0.5	8	60±0.8	10±2	2.0	0.33~220	290
ER 30SP	30	14±0.5	8	80±1.0	10±2	3.0	0.47~230	430
ER 50SP	50	20±0.75	14	100±1.0	13±2	4.0	0.47~270	830
ER100SP	100	20±0.75	14	200±1.2	15±2	8.5	1.0~680	1900
ER150SP	150	25±1.0	18	250±1.5	22±2	10.0	0.82~470	3400
ER200SP	200	25±1.0	18	300±1.5	22±2	12.5	1.0~680	4240
ER300SP	300	40±1.25	32	300±1.5	22±2	12.5	0.56~330	8100
ER500SP	500	50±1.5	40	450±2.0	25±2	20.0	0.56~330	19800

● ER3SP through ER10SP will be supplied with lead wires.

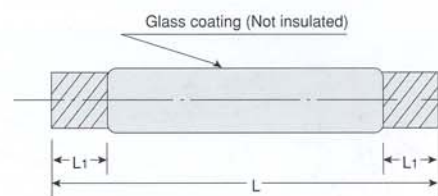
● ER20SP through ER500SP will be supplied with terminals as option, if so requested with an order. (The details on the terminals are shown at page 12).

### [SP with lead wires]



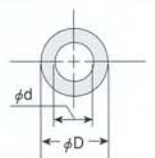
(ER3SP~ER10SP)

### [SP without terminal]



(ER20SP~ER500SP)

**Terminal electrode**  
Standard: Aluminum  
When soldered: Brass



### [Standard Resistance]

While the resistance values available currently are as shown at the above table, those frequently ordered are now standardized. The resistors with the standard resistance values will be supplied with a shorter delivery.

### SP STANDARD RESISTANCE VALUES:

Type No.	Standard Resistance ( $\Omega$ )						Resistance Tolerances $\pm 10\%$
ER 3SP	4.7	10	22	47	100		
ER 5SP	4.7	10	22	47	100	220	
ER 10SP	4.7	10	22	47	100	220	
ER 20SP	4.7	10	22	47	100	220	
ER 30SP	4.7	10		47	100	220	
ER 50SP	4.7	10	22	47	100	220	

Type No.	Standard Resistance ( $\Omega$ )						Resistance Tolerances $\pm 10\%$
ER 100SP	4.7	10	22	47	100	220	
ER 150SP	4.7	10		47	100	220	
ER 200SP	4.7	10	22	47	100	220	
ER 300SP	4.7	10	22	47	100	220	
ER 500SP		10	22	47	100	220	

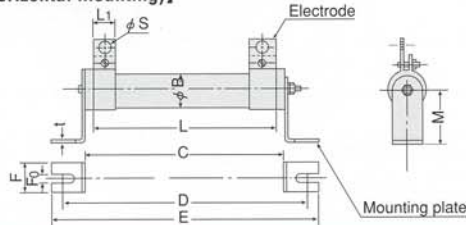
### SPY STANDARD SPECIFICATIONS (Horizontal Mounting Type):

Type No.	Rated Power (W)	Dimensions (mm)											Resistance ( $\Omega$ )
		$\phi B$	L	L <sub>1</sub>	$\phi S$	C	E	D	F	F <sub>0</sub>	M	t	
ER 20SPY	20	14	60	9	3.2	70	103	90	16	5.0	16	0.8	1, 5, 10, 20, 30, 50, 100
ER 30SPY	30	14	80	9	3.2	90	123	110	16	5.0	16	0.8	1, 5, 10, 20, 30, 50, 100
ER 50SPY	50	20	100	12	4.2	110	143	130	16	5.0	16	0.8	1, 5, 10, 20, 30, 50, 100
ER 100SPY	100	20	200	12	4.2	210	243	230	16	5.0	16	0.8	5, 10, 20, 30, 50, 100
ER 150SPY	150	25	250	21	5.2	262	315	300	26	6.2	27	1.0	5, 10, 20, 30, 50, 100
ER 200SPY	200	25	300	21	5.2	312	365	350	26	6.2	27	1.0	10, 20, 30, 50, 100
ER 300SPY	300	40	300	21	5.2	320	380	360	40	10.0	40	1.5	10, 20, 30, 50, 100

### SPT STANDARD SPECIFICATIONS (Vertical Mounting Type):

Type No.	Rated Power (W)	Dimensions (mm)								Resistance ( $\Omega$ )
		$\phi B$	L	L <sub>1</sub>	D	$\phi C$	$\phi S$	M	E	
ER 20SPT	20	14	60	9	70	16	3.2	31	10	1, 5, 10, 20, 30, 50, 100
ER 30SPT	30	14	80	9	90	16	3.2	31	10	1, 5, 10, 20, 30, 50, 100
ER 50SPT	50	20	100	12	110	22	4.2	42	10	1, 5, 10, 20, 30, 50, 100

#### [SPY (Horizontal mounting)]



#### [SPT (Vertical mounting)]

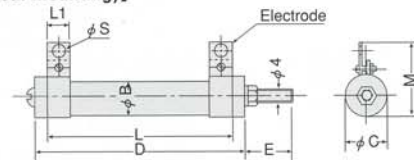


Fig. 7 SP Derating Curve

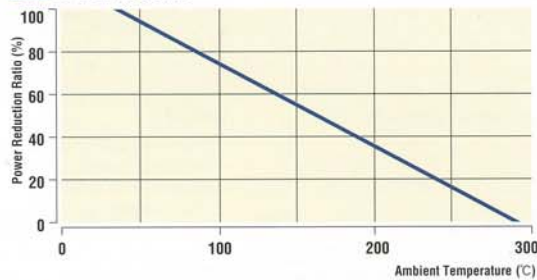


Fig. 9 SP Power vs. Surface Temperature Increase (2)

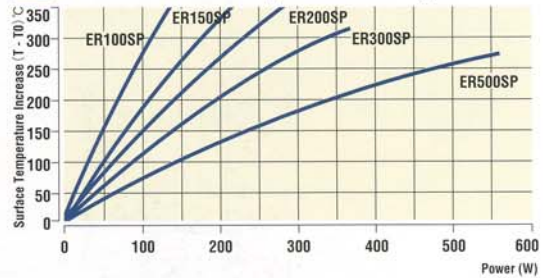


Fig. 8 SP Power vs Surface Temperature Increase (1)

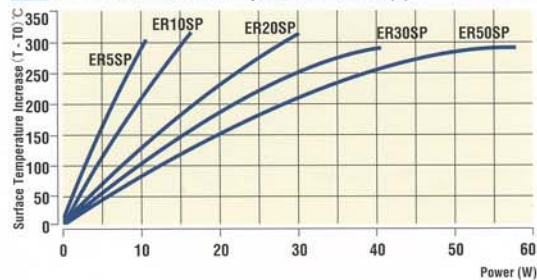


Fig. 10 SP Frequency Characteristics

