

# High performance regulated HV module

Ultra compact / Low noise

APPLICATIONS
* High voltage testing
* PMT, MCP, radiation counter
* Electron Beam / Ion Beam
* Mass spectrometry
* Electrostatic chuck(ESC)

**NEW**

S series ■■■



- > Low noise, high stability
- > Aluminum case
- > Detachable input connector
- > Compact and light weight
- > High reliability
- > Both external VR or voltage for control

## SUMMARY

The S series is a regulated, versatile, modular HV power supply used in a wide variety of applications including mass spectrometry and electron microscopes. From the OEM to the laboratory, they are an excellent choice when you require a highly stable output. Output can be controlled using either an external control voltage or external variable resistor. An optional output voltage monitor is also available. With a diverse range of models up to 30kV/30W, you will find something for nearly every requirement.

## LINEUP \*P for Positive N for Negative Output Polarity.

Output Voltage (kV)	Output Current (mA)	Output Power (W)	MODEL	Ripple (%p-p)	Regulation		Case
					Line (%)	Load (%)	
0 to 0.6	2.5	1.5	S1-0.6*	0.008	±0.005	0.005	C3B
	5	3	S3-0.6*				
	10	6	S6-0.6*				
	25	15	S15-0.6*				
0 to 1.1	1.4	1.5	S1-1.1*	0.005	±0.005	0.005	C3B
	2.75	3	S3-1.1*				
	5.5	6	S6-1.1*				
	12	15	S15-1.1*				
0 to 1.5	1	1.5	S1-1.5*	0.005	±0.005	0.005	C3B
	2	3	S3-1.5*				
	4	6	S6-1.5*				
	10	15	S15-1.5*				
0 to 2	0.75	1.5	S1-2*	0.005	±0.005	0.005	C3B
	1.5	3	S3-2*				
	3	6	S6-2*				
	7.5	15	S15-2*				
0 to 3	0.5	1.5	S1-3*	0.005	±0.005	0.005	C3B
	1	3	S3-3*				
	2	6	S6-3*				
	5	15	S15-3*				
0 to 5	0.3	1.5	S1-5*	0.005	±0.005	0.005	C3B
	0.6	3	S3-5*				
	1.2	6	S6-5*				
	3	15	S15-5*				
0 to 6	2.5	1.5	S1-0.6*	0.008	±0.005	0.005	C3B
	5	3	S3-0.6*				
	10	6	S6-0.6*				
	25	15	S15-0.6*				
0 to 10	0.15	1.5	S1-10*	0.01	±0.01	0.01	C5
	0.3	3	S3-10*				
	0.6	6	S6-10*				
	1.5	15	S15-10*				
0 to 12	0.12	1.5	S1-12*	0.01	±0.01	0.01	C5
	0.24	3	S3-12*				
	0.46	6	S6-12*				
	1.2	15	S15-12*				
0 to 15	0.2	3	S3-15*	0.02	±0.01	0.01	C6
	0.36	6	S6-15*				
	1	15	S15-15*				
	2	30	S30-15*				
0 to 20	0.13	3	S3-20*	0.02	±0.01	0.01	C6
	0.26	6	S6-20*				
	0.75	15	S15-20*				
	1.5	30	S30-20*				
0 to 25	0.1	3	S3-25*	0.02	±0.01	0.01	C6
	0.2	6	S6-25*				
	0.6	15	S15-25*				
	1.2	30	S30-25*				
0 to 30	0.08	3	S3-30*	0.02	±0.01	0.01	C6A
	0.16	6	S6-30*				
	0.5	15	S15-30*				
	1	30	S30-30*				

Output Voltage (kV)	Output Current (mA)	Output Power (W)	MODEL	Ripple (%p-p)	Regulation		Case
					Line (%)	Load (%)	
0 to 6	0.25	1.5	S1-6*	0.005	±0.005	0.005	C3B
	0.5	3	S3-6*				
	1	6	S6-6*				
	2.5	15	S15-6*				
0 to 10	0.15	1.5	S1-10*	0.01	±0.01	0.01	C5
	0.3	3	S3-10*				
	0.6	6	S6-10*				
	1.5	15	S15-10*				
0 to 12	0.12	1.5	S1-12*	0.01	±0.01	0.01	C5
	0.24	3	S3-12*				
	0.46	6	S6-12*				
	1.2	15	S15-12*				
0 to 15	0.2	3	S3-15*	0.02	±0.01	0.01	C6
	0.36	6	S6-15*				
	1	15	S15-15*				
	2	30	S30-15*				
0 to 20	0.13	3	S3-20*	0.02	±0.01	0.01	C6
	0.26	6	S6-20*				
	0.75	15	S15-20*				
	1.5	30	S30-20*				
0 to 25	0.1	3	S3-25*	0.02	±0.01	0.01	C6
	0.2	6	S6-25*				
	0.6	15	S15-25*				
	1.2	30	S30-25*				
0 to 30	0.08	3	S3-30*	0.02	±0.01	0.01	C6A
	0.16	6	S6-30*				
	0.5	15	S15-30*				
	1	30	S30-30*				

## SPECIFICATIONS

### Input Voltage/Current

Model	Input Voltage	Input Current(TYP)	
		up to 6kV	10kV to 30kV
S1	+12Vdc±1V	380mA	410mA
S3	+24Vdc±5%	330mA	360mA
S6		500mA	550mA
S15		1A	
S30		2A	

**Output Voltage Control** S1,S3,S6 : By external potentiometer 5kΩ or external control voltage(Vcon-in 0 to 6Vdc)  
S15,S30 : By external potentiometer 5kΩ or external control voltage(Vcon-in 0 to 3Vdc)

**Line Regulation** See table  
(S1 : at maximum voltage for ±1V input line change)  
(S3,S6,S15,S30 : at maximum voltage for ±5% input line change)

**Load Regulation Stability** See table(at maximum voltage for 0 to 100% load change)  
S1,S3,S6 : 0.01%/hr  
S15,S30 : 0.02%/hr

**Protection** Overload, arc & short circuit protected

**Temperature Coef.** 80ppm/°C

**Input terminal** 8 pin connector  
Mating connector and pins are assorted

(Recommendation :  
wire for pin ①, ② are AWG18  
wire for pin ③ to ⑧ are AWG22 to 18  
Crimp Tooling for Molex crimp terminal 2478, 2578)

**Output Cable** HV flying lead 50cm(1.6 feet)  
When more than 25cm is required specify the length.  
<e.g.->S1-3P(output cable 1m)

**Temperature range** Operating : 0 to 50°C  
Storage : -20 to 60°C

**Monitor** Voltage(option) and current monitor.  
See the table on page 08 for details.

**Linearity** Within ±0.5% of control voltage versus output voltage.  
Residue voltage when Vcon 0V is within 0.3%.

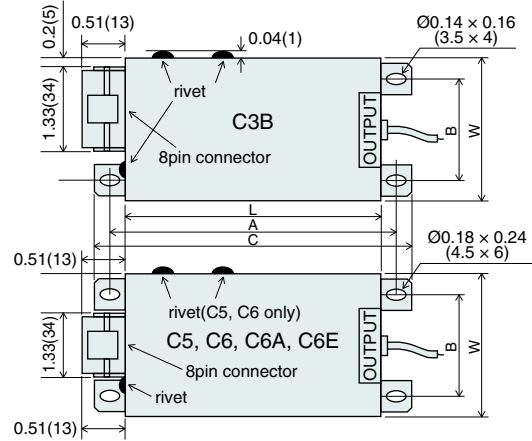
## OPTIONS

**L2** Voltage Monitor Output  
up to 6kV : 1V/@1kV  
10k to 30kV : 1V/@10kV  
Accuracy ±2.5% F.S.

See the table on page 08 for details  
Add "-L2" to the Model number at time of order.  
(i.e. S1-6P-L2)

**CN8R** Assembled input connector (accessory)  
(connector with 25cm flying leads)

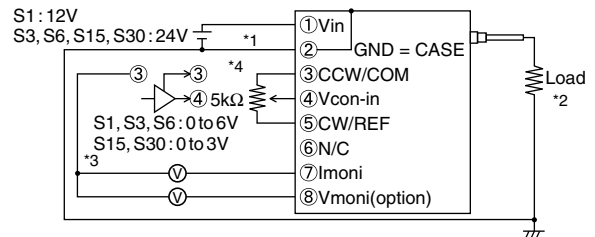
## DIMENSIONS inch(mm)



Case	A	B	C	W	L	H
C3B	3.86 (98)	1.57 (40)	4.17 (106)	1.97 (50)	3.58 (91)	1.22 (31)
C5	4.72 (120)	1.97 (50)	5.12 (130)	2.76 (70)	4.33 (110)	1.26 (32)
C6	5.12 (130)	2.76 (70)	5.51 (140)	3.94 (100)	4.72 (120)	1.38 (35)
C6A	6.69 (170)	2.76 (70)	7.09 (180)	3.94 (100)	6.3 (160)	1.5 (38)
C6E	7.68 (195)	3.54 (90)	8.07 (205)	4.72 (120)	7.28 (185)	1.69 (43)

\* Please add 13mm to H for models with +HS case.

## CONNECTION DIAGRAM



\*1 GND pin ② must be properly grounded

\*2 Return line from the load must be connected to GND pin ②

\*3 Input impedance of Vcon-in pin ④ is  $\geq 30k\Omega$

\*4 Potentiometer of T.C  $\leq 100PPM/^{\circ}C$ , PC  $\geq 1/4W$  is recommended

## OUTPUT MONITOR

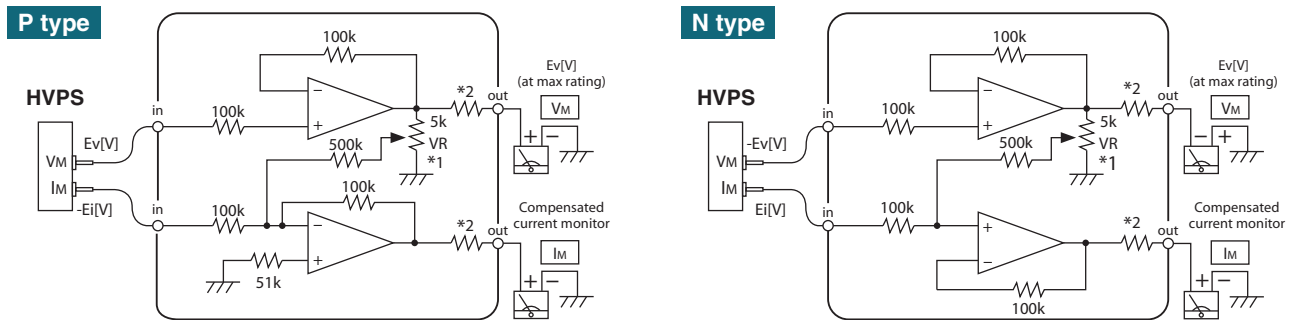
### Output value of Voltage(option) / Current monitor

- Polarity of V monitor is same as that of HV output.
- Input current increase by 10 to 20% when V monitor(option) is added.
- Polarity of current monitor is negative for P type(+), and positive for N type(-).
- Current monitor output has off set voltage proportional to output voltage.
- Use voltmeter with input impedance more than 10MΩ to measure Voltage / Current monitor.

MODEL	Output voltage Vo(kV)	0.6	1.1	1.5	2	3	5	6	10	12	15	20	25	30
S1 S3 S6	I monitor	1V/@10mA	1V/@1mA						1V/@100μA					
	V monitor (option)	1V/@1kV						1V/@10kV						
S15 S30	I monitor	1V/@10mA	0.3V/@1mA			1V/@1mA			0.3V/@100μA			1V/@100μA		
	V monitor (option)	1V/@1kV						1V/@10kV						

### Application note: Compensation and amplification circuit of current monitor

Current monitor of S series is a simple monitor mainly for detecting output short circuit and has offset voltage.  
Voltage monitor is just buffer AMP. Circuit of current monitor deduct current over voltage detecting resistor inside.



- \*1) At maximum output voltage, set  $I_m$  to be 0V without load. \* Power supply of OP-AMP is  $\pm 15V$   
\*2) Place resistors so that meter become full scale at rated output. (not required when using digital meter)

