

High power & Low Noise HV Power Supplies

Ultra compact / Low noise

NEW

RA / RB series

— 0.3kV to 30kV
/5W, 10W, 30W, 60W—

- > Low noise, high stability
- > Both external VR and voltage for output control
- > Reliable design with protection for arc and continuous short circuit
- > UL60950-1, CSA60950-1(C-UL) approved, CE marked



APPLICATIONS

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

SUMMARY

Our RA/RB series features compact, highly stable modules. Because of their extremely low noise, they are ideal for PMT, E-Beam, HV testing, and many other applications. Voltage and current monitors are standard functions, while only half the size of older models.

LINEUP

*P for Positive N for Negative output polarity.

Output Voltage (kV)	Output Current (mA)	Output Power (W)	RA		RB		Output Voltage (kV)	Output Current (mA)	Output Power (W)	RA		RB	
			MODEL	Ripple (%p-p)	MODEL	Ripple (%p-p)				MODEL	Ripple (%p-p)		
0 to 0.3	17	5	RA5 -0.3*	0.005	RB5 -0.3*	0.05	0 to 10	0.5	5	RA5 -10*	0.001	RB5 -10*	0.08
	34	10	RA10-0.3*		RB10-0.3*			RA10-10*	RB10-10*				
	100	30	RA30-0.3*		RB30-0.3*			RA30-10*	RB30-10*				
	200	60	RA60-0.3*		RB60-0.3*			RA60-10*	RB60-10*				
0 to 0.6	8.4	5	RA5 -0.6*	0.005	RB5 -0.6*	0.05	0 to 15	0.34	5	RA5 -15*	0.001	RB5 -15*	0.08
	17	10	RA10-0.6*		RB10-0.6*			RA10-15*	RB10-15*				
	50	30	RA30-0.6*		RB30-0.6*			RA30-15*	RB30-15*				
	100	60	RA60-0.6*		RB60-0.6*			RA60-15*	RB60-15*				
0 to 1	5	5	RA5 -1*	0.005	RB5 -1*	0.05	0 to 20	0.25	5	RA5 -20*	0.003	RB5 -20*	0.08
	10	10	RA10-1*		RB10-1*			RA10-20*	RB10-20*				
	30	30	RA30-1*		RB30-1*			RA30-20*	RB30-20*				
	60	60	RA60-1*		RB60-1*			RA60-20*	RB60-20*				
0 to 1.5	3.4	5	RA5 -1.5*	0.005	RB5 -1.5*	0.05	0 to 25	0.2	5	RA5 -25*	0.003	RB5 -25*	0.08
	6.7	10	RA10-1.5*		RB10-1.5*			RA10-25*	RB10-25*				
	20	30	RA30-1.5*		RB30-1.5*			RA30-25*	RB30-25*				
	40	60	RA60-1.5*		RB60-1.5*			RA60-25*	RB60-25*				
0 to 3	1.7	5	RA5 -3*	0.005	RB5 -3*	0.05	0 to 30	0.17	5	RA5 -30*	0.003	RB5 -30*	0.08
	3.4	10	RA10-3*		RB10-3*			RA10-30*	RB10-30*				
	10	30	RA30-3*		RB30-3*			RA30-30*	RB30-30*				
	20	60	RA60-3*		RB60-3*			RA60-30*	RB60-30*				
0 to 6	0.84	5	RA5 -6*	0.005	RB5 -6*	0.05	Note: 60W type and RA series 10kV to 30kV is not UL, CE marked.						
	1.7	10	RA10-6*		RB10-6*								
	5	30	RA30-6*		RB30-6*								
	10	60	RA60-6*		RB60-6*								

OPTION

CN8ML Assembled input connector (accessory)
(connector with 25cm flying leads)

SPECIFICATIONS

Input Voltage/Current

Model	Input Voltage	Input Current
RA5, RB5	12 - 15Vdc±10%	0.8A typ. @ 12V
RA10, RB10	+24Vdc±10%	0.7A typ.
RA30, RB30		1.7A typ.
RA60, RB60		3.4A typ.

Output Voltage Control

By external potentiometer 5kΩ or external control voltage (Vcon-in 0 to +5Vdc)

Output Voltage Accuracy

±2% / Vcon-in=5.00V

Line Regulation

0.01%
(at maximum voltage for ±10% input line change)

Load Regulation

0.01%
(at maximum voltage for 0 to 100% load change)

Stability

100ppm / Hr

Temperature Coef.

80ppm / °C

Monitors

+5V / rated output for both voltage / current
1kΩ output impedance ±2% F.S Accuracy

Reference Volt.

5v±1%
Line Reg. 0.015% / V

Protection

Overload, arc & Continuous output short circuit

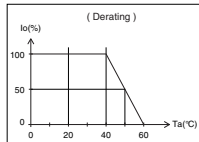
Input terminal

8 pin connector
Mating connector and pins are assorted
(Recommendation :
wire for pin ①, ② are AWG22
wire for pin ③ to ⑧ are AWG22 or 24
Crimp Tooling for Molex crimp terminal 50351)

Output Cable

HV flying lead 50cm (1.6 feet)
HV GND flying lead 50cm (1.6 feet)
for units 0.3kV to 6kV
Shield cable 50cm (1.6feet) for RA (10 to 30kV)
Operating : 0 to 60°C (Derating: 40 to 60°C)
Storage : -20 to 60°C

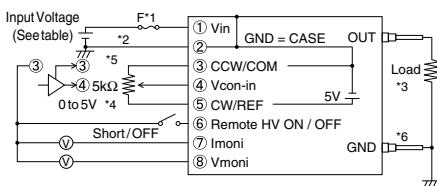
Temperature range



Humidity Certification

20 to 80%RH(no condensation)
UL60950-1
CSA60950-1(C-UL)
CE

CONNECTION DIAGRAM



*1 Please implement 4A fuse for 60W model or UL certified 2A fuse for other models on Vin terminal since this power supply does not install an input fuse.

*2 GND pin ② must be properly grounded

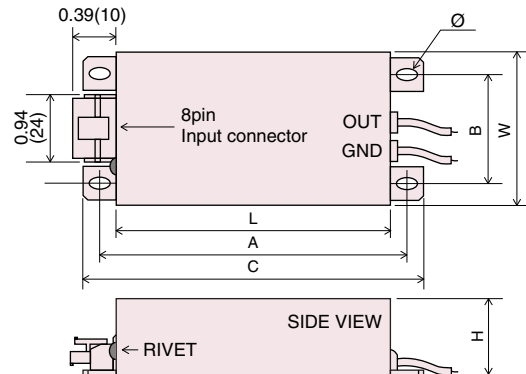
*3 Return line from the load must be connected to GND or pin ②

*4 Input impedance of Vcon-in pin ④ is ≥ 100kΩ

*5 Potentiometer of T.C ≤ 100PPM/°C, PC ≥ 1/4W is recommended

*6 No lead wire for units from 10kV to 30kV

DIMENSIONS inch(mm)



Model	Output Voltage (kVdc)	L	A	B	C	H	W	Ø	Weight Approx.(g)	
RA/RB	up to 6kV (except 60W type)	4.33 (110)	4.65 (118)	1.57 (40)	4.96 (126)	0.98 (25)	1.97 (50)	0.14 × 0.19 (3.5 × 5)	300	
	up to 6kV (60W type)	4.33 (110)	4.65 (118)	1.57 (40)	4.96 (126)	0.98 (25)	3.94 (100)			
RB	10, 15, 20kV (except 60W type)	5.31 (135)	5.71 (145)	1.57 (40)	6.10 (155)	1.18 (30)	1.97 (50)		0.18 × 0.24 (4.5 × 6)	450
	10, 15, 20kV (60W type)	5.31 (135)	5.71 (145)	1.57 (40)	6.10 (155)	1.18 (30)	3.94 (100)			
	25, 30kV (except 60W type)	7.09 (180)	7.48 (190)	1.57 (40)	7.87 (200)	1.18 (30)	1.97 (50)			
RA	25, 30kV (60W type)	7.09 (180)	7.48 (190)	1.57 (40)	7.87 (200)	1.18 (30)	3.94 (100)		0.18 × 0.24 (4.5 × 6)	580
	10, 15kV (except 60W type)	6.3 (160)	6.7 (170)	2.75 (70)	7.09 (180)	1.5 (38)	3.94 (100)			
	10, 15kV (60W type)	6.3 (160)	6.7 (170)	2.75 (70)	7.09 (180)	1.5 (38)	7.87 (200)			
	20, 25, 30kV (except 60W type)	7.3 (185)	7.7 (195)	3.54 (90)	8.07 (205)	1.7 (43)	3.94 (100)			
RA	20, 25, 30kV (60W type)	7.3 (185)	7.7 (195)	3.54 (90)	8.07 (205)	1.7 (43)	9.45 (240)	0.18 × 0.24 (4.5 × 6)	1500	
	20, 25, 30kV (60W type)	7.3 (185)	7.7 (195)	3.54 (90)	8.07 (205)	1.7 (43)	9.45 (240)			

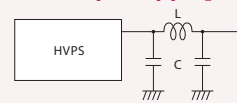
Operation Notes

- Do not touch the HV output cable right after turning off the power supply because there might be residue voltage. Make sure the voltage is 0V before touching the output.
- Make sure to ground the GND terminal, pin②, for extra safety, although this series is designed with various safety features as built-in type HV module.
- Avoid continuous short circuit.

OUTPUT RIPPLE

Switching frequency of RA/RB series is about 40kHz to 80kHz. If ripple (noise or hum) of different frequency is shown, it might be from outside. Have another solution like keep away from noise source.

[Reduce output ripple]



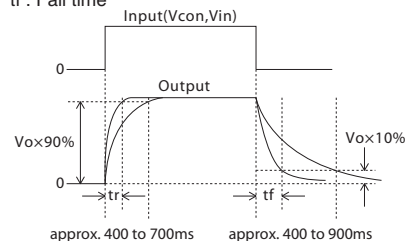
L is about 1mH to 10mH.
C is about 0.001μF to 0.1μF. (Check the rated voltage)

RESPONSE

Typical value at rated load

tr : Rise time

tf : Fall time



tr, tf shall be slow with capacitive load. A dummy resistor shall work for quick fall time.

