

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		0.34	10	RA10-30*		RB10-30*	
	1.7	10	RA10-6*		RB10-6*				RB10-30*				
	5	30	RA30-6*		RB30-6*				RB30-30*				
	10	60	RA60-6*		RB60-6*				RB60-30*				

Note: 60W type and RA series 10kV to 30kV is not UL, CE marked.

ACCESSORY

CN8ML Assembled input connector (5W, 10W and 30W models)
(connector with 25cm flying leads)

CN8VH Assembled input connector (60W models)
(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 Line Regulation

±2% / Vcon-in=5.00V
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. Monitors

80ppm / °C
+5V / rated output for both voltage / current
1kΩ output impedance ±2% F.S Accuracy

Reference Volt.

5v±1%
Line Reg. 0.015% / V

Protection Input terminal

Overload, arc & Continuous output short circuit
8 pin connector

Mating connector and pins are assorted

Recommendations :

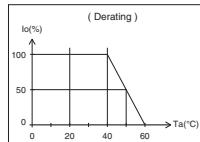
60W models : wire for pin ①, ② are AWG18, and wire for pin ③ to ⑧ are AWG 22 to 18

other models : wire for pin ①, ② are AWG22, and wire for pin ③ to ⑧ are AWG 22 or 24

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

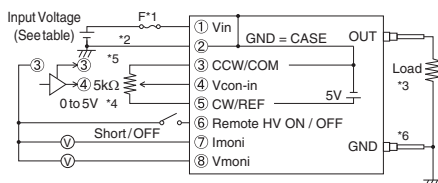
Temperature range



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

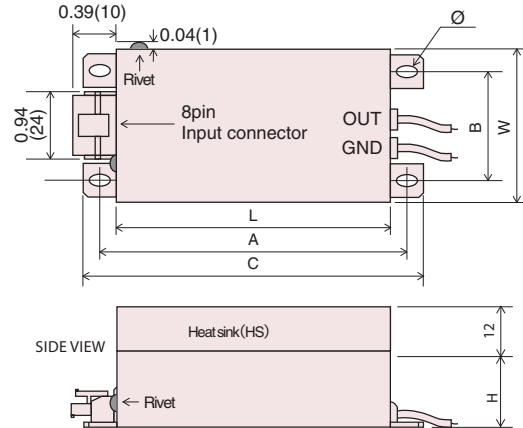
*3 Return line from the load must be connected to GND or pin ②

*4 Input impedance of Vcon-in pin ④ is $\geq 100k\Omega$

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

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

DIMENSIONS inch(mm) Heat sink is equipped for 60W models.



Model	Output voltage	L	A	B	C	H	W	Ø	Weight(g) approx. [with HS]
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 x 0.19 (3.5 x 5)	300
	up to 6kV (60W type)	4.33 (110)	4.65 (118)	2.76 (70)	4.96 (126)	0.98 (25)	3.94 (100)	0.18 x 0.24 (4.5 x 6)	600 [760]
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)	0.14 x 0.19 (3.5 x 5)	450
	10, 15, 20kV (60W type)	5.31 (135)	5.71 (145)	2.76 (70)	6.10 (155)	1.18 (30)	3.94 (100)	0.14 x 0.19 (3.5 x 5)	1200 [1430]
	25, 30kV (except 60W type)	7.09 (180)	7.48 (190)	1.57 (40)	7.87 (200)	1.18 (30)	1.97 (50)	0.14 x 0.19 (3.5 x 5)	580
	25, 30kV (60W type)	7.09 (180)	7.48 (190)	2.76 (70)	7.87 (200)	1.18 (30)	3.94 (100)	0.18 x 0.24 (4.5 x 6)	1200 [1430]
RA	10, 15kV (except 60W type)	6.3 (160)	6.7 (170)	2.75 (70)	7.09 (180)	1.5 (38)	3.94 (100)	0.18 x 0.24 (4.5 x 6)	1000
	10, 15kV (60W type)	6.3 (160)	6.7 (170)	5.51 (140)	7.09 (180)	1.5 (38)	7.87 (200)		2000
	20, 25, 30kV (except 60W type)	7.3 (185)	7.7 (195)	3.54 (90)	8.07 (205)	1.7 (43)	3.94 (100)		1500
	20, 25, 30kV (60W type)	7.3 (185)	7.7 (195)	7.09 (180)	8.07 (205)	1.7 (43)	9.45 (240)		3000

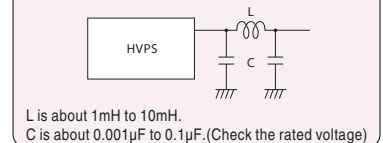
Operation Notes

- 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, pin ②, 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 50kHz 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]

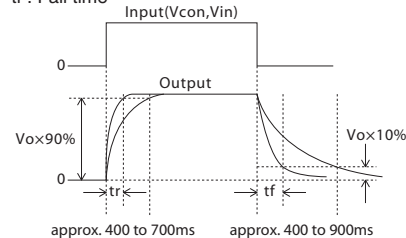


RESPONSE

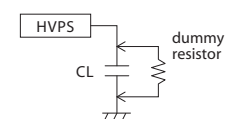
Typical value at rated load

tr : Rise time

tf : Fall time



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





USA/canada : 1-888-652-8651
other countries : 1-81-77-561-2112

Customer Inquiry Sheet (HV modules)

Please copy this page and above fax number after filling out form below.

■ I would like

- A quotation
- An explanation of product
- A demonstration
- To purchase
- Other ()

■ Give us your requirement / comment

■ Please fill in below.

Address:	
Company:	
Dept.:	Title:
Name:	
Tel:	Fax:
E-mail:	

Warranty

We warrant that products contained in this catalog (hereinafter, the "Products") are free from defects in material and workmanship under normal use for a period of one (1) year from the date of shipment thereof. However, the warranty period for X-ray detectors and X-ray source shall be either one (1) year from the date of shipment or 1,000 hours, whichever shorter. The above warranty shall not apply to any Product which, at our sole judgment, has been: i) Repaired or altered by persons unauthorized by us; or ii) Connected, installed, adjusted or used otherwise than in accordance with the instructions furnished by us (including being used in an inappropriate installation environment, such as in corrosive gas, high temperature and humidity). We are not liable for any loss, damage or failure of the Products after the shipment thereof caused by external factors such as disasters. If any Product is showed to be defective as satisfactory to us, we, at our sole discretion, repair or replace such defective Products at no cost to the purchaser. We assume no liability to the purchaser or any third party for special, incidental, consequential, or other damages resulting from a breach of the foregoing warranty. This warranty excludes any and all other warranties not set forth herein, express or implied, including without limitation the implied warranties of merchantability or fitness for a particular purpose. The Products are not designed and produced for such applications as requiring extremely high reliability and safety, or involving human lives (such as nuclear power, aerospace, social infrastructure facility, medical equipment, etc.). The use under such environment is not covered by this warranty and may require additional design and manufacturing processes.

✓ Matsusada Precision Inc.

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