Rack-mount type HV Power Supply

AU Series



Low profile / High power Rack-mount type HV power supply

WIDE RANGE OF LINEUP

FULL OF REMOTE FUNCTIONS

ULTRA LOW PROFILE / SPACE SAVING

AU series

- ▶ 1kV to 120kV
- ▶ 0.25mA to 2200mA
- ▶ 30W to 2200W

C E *up to 300W models



www.matsusada.com

AU series

Best & Long Seller of Rack-mount type HV power supply!

Maximum 2.2kW

output power

in this ultra low profile design







AU series is a high performance, high-reliability and high-quality DC high voltage power supply as a result of our high-voltage power technology built up over the years. High efficiency and ultra miniaturization is realized with our switching and voltage isolation technology.

With wide lineup of over 300 models and various options the best suitable model for your application can be selected from the output range of 1kV to 120kV / 30W to 2.2kW. AU series has various remote control and monitor functions as standard, and by adding digital control interface it will contribute to the extensibility for ATE (Automatic Test Equipment) system as well as to various high-voltage experiments and to evaluations of inverters and power devices. AU series is only a third to a half size of conventional power supplies and dedicated to compactness of device and saving space of facilities. Double and triple protections are added for even safer operation. With new master-slave option higher power output operation is now possible.

LINEUP

Output Voltage	Output Current (mA)	Output Power (W)	MODEL
	30	30	★ AU-1*30
	60	60	★ AU-1*60
	100 150	100 150	★ AU-1*100 ★ AU-1*150
1kV	300	300	★ AU-1*300
	600	600	AU-1*600
	1200	1200	AU-1*1200
	2200	2200	AU-1*2200
	400	600	AU-1.5*400
1.5kV	800	1200	AU-1.5*800
	1460	2200	AU-1.5*1460 * AU-2*15
	15 30	30 60	★ AU-2*30
	50	100	★ AU-2*50
	75	150	★ AU-2*75
2kV	150	300	★ AU-2*150
	300	600	AU-2*300
	600	1200	AU-2*600
	1100	2200	AU-2*1100
	10	30	★ AU-3*10 ★ AU-3*20
	20 33	60 100	★ AU-3^20 ★ AU-3*33
	50	150	★ AU-3*50
3kV	100	300	★ AU-3*100
	200	600	AU-3*200
	400	1200	AU-3*400
	733	2200	AU-3*733
	6	30	★ AU-5*6
	12 20	60 100	★ AU-5*12 ★ AU-5*20
	30	150	★ AU-5*30
5kV	60	300	★ AU-5*60
	120	600	AU-5*120
	240	1200	AU-5*240
	440	2200	AU-5*440
	5	30	* AU-6*5
	10 16	60 100	★ AU-6*10 ★ AU-6*16
	25	150	★ AU-6*25
6kV	50	300	★ AU-6*50
	100	600	AU-6*100
	200	1200	AU-6*200
	366	2200	AU-6*366
1	3	30	* AU-10*3
1	6	100	★ AU-10*6 ★ AU-10*10
	10 15	100 150	★ AU-10*10 ★ AU-10*15
10kV	30	300	★ AU-10*30
	60	600	AU-10*60
1	120	1200	AU-10*120
	220	2200	AU-10*220
	2	30	★ AU-15*2
	4 6.6	100	★ AU-15*4 ★ AU-15*6.6
1	6.6	100 150	* AU-15*6.6 * AU-15*10
15kV	20	300	★ AU-15*20
	40	600	AU-15*40
1	80	1200	AU-15*80
	146	2200	AU-15*146
	1.5	30	★ AU-20*1.5
1	3	100	★ AU-20*3 ★ AU-20*5
1	5 7.5	100 150	★ AU-20*5 ★ AU-20*7.5
20kV	15	300	★ AU-20*15
	30	600	AU-20*30
1	60	1200	AU-20*60
	110	2200	AU-20*110

Output Voltage	Output Current (mA)	Output Power (W)	MODEL
	1	30	★ AU-30*1
	2	60	★ AU-30*2
	3.3	100	★ AU-30*3.3
30kV	5	150	★ AU-30*5
JOKV	10	300	★ AU-30*10
	20	600	AU-30*20
	40	1200	AU-30*40
	73.3	2200	AU-30*73.3
	0.75	30	★ AU-40*0.75
	1.5	60	★ AU-40*1.5
	2.5	100	★ AU-40*2.5
40kV	3.75	150	★ AU-40*3.75
1011	7.5	300	★ AU-40*7.5
	15	600	AU-40*15
	30	1200	AU-40*30
	55	2200	AU-40*55
	0.6	30	★ AU-50*0.6
	1.2	60	★ AU-50*1.2
	2	100	★ AU-50*2
501.17	3	150	★ AU-50*3
50kV	6	300	★ AU-50*6
	12	600	AU-50*12
	24	1200	AU-50*24
	44	2200	AU-50*44
	0.5	30	★ AU-60*0.5
	1	60	★ AU-60*1
	1.6	100	★ AU-60*1.6
20111	2.5	150	★ AU-60*2.5
60kV	5	300	* AU-60*5
	10	600	AU-60*10
	20	1200	AU-60*20
	36.6	2200	AU-60*36.6
	0.37	30	★ AU-80*0.37
	0.75	60	★ AU-80*0.75
	1.25	100	★ AU-80*1.25
	1.87	150	★ AU-80*1.87
80kV	3.75	300	★ AU-80*3.75
	7.5	600	AU-80*7.5
	15	1200	AU-80*15
	27.5	2200	AU-80*27.5
	0.3	30	★ AU-100*0.3
	0.6	60	★ AU-100*0.6
	1	100	★ AU-100*1
	1.5	150	★ AU-100*1.5
100kV	3	300	★ AU-100 1.5 ★ AU-100*3
	6	600	AU-100'6
	12	1200	AU-100 6 AU-100*12
	22	2200	AU-100*22
	0.25	30	★ AU-120*0.25 ★ AUL 120*0.5
	0.5	100	★ AU-120*0.5 ★ AU-120*0.83
	0.83	100	★ AU-120*0.83
120kV	1.25	150	★ AU-120*1.25
	2.5	300	★ AU-120*2.5
	5	600	AU-120*5
	10	1200	AU-120*10
	18.3	2200	AU-120*18.3

 $[\]bigstar \ \mathsf{P} \cdots \mathsf{Positive} \ \mathsf{output} \quad \mathsf{N} \cdots \mathsf{Negative} \ \mathsf{output} \quad \mathsf{R} \cdots \mathsf{Reversible} \ \mathsf{output}$

Pro-Positive output No-Pregative output No-Preversible output <e.g.> AU-1R30: 0V to ±1kV / 0A to 30mA

Positive, negative or reversible high voltage with respect to chassis ground.

Units from 1kV to 6kV, the polarity may be reversed by swapping the internal cables.

Units from 10kV to 120kV, by swapping the internal high voltage module.

\bigstar : CE marking models.

They correspond to Low Voltage Directive and EMC Directive.

As for CE marking, the models which have not yet acquired CE marking at present are going to acquire them in the near future.

If you need the latest information about the status of the acquisition, please contact the nearest sales office.

WIDE RANGE OF LINEUP

The best output range and function from abundance of lineup of 1kV to 120kV / 30W to 2.2kW, over 300 models can be selected. Therefore no need to choose a product with over output or specifications avoiding wasted investment.

AU series has -LC option for automatic switch of constant voltage / constant current modes as well as other various options such as different input voltage or slow ramp up are available.

FULL OF REMOTE FUNCTIONS

High-voltage output voltage and output current (output cut off value for standard type, and current limit value for AU with -LC option) can be controlled. Also equipped with output ON / OFF, monitor output for voltage / current and status output of high voltage is equipped and door switch is standard as a safety function.

Also interface of GPIB, RS-232C, RS-485 and USB can be added as an option for computer control. A system integrartion with other measuring instruments or control devices can be constructed for faster testing and development. It's easy to build a system up with the combination of our DC (low voltage) power supplies or AC power supplies.

ULTRA LOW PROFILE / SPACE SAVING



Panel height is only 1.73" (models less than 1kV to 60kV / 30W to 300W models) and 19-inch standard rack mount type. Miniaturization and high reliability that are conflicting themes for high-voltage power supplies are cleared by our high voltage insulation technology.

AU series has been receiving good reputation for applications requires space saving such as inspection system of production line, or requires combination several power supplies.

APPLICATIONS

- Evalution for inverters or power devices (IGBT, MOS-FET)
- ATE (Automatic Test Equipment)
- Electron Beams
- Ion Beams
- X-ray tube
- Aging of electronic components
- Capacitor Charging
- Insulator Testing
- All kinds of High-Voltage Testing

Input Voltage

30W to 300W 100VAC to 120VAC ±10% 50/60Hz single phase 600W to 2200W 200VAC to 240VAC ±10% 50/60Hz single phase 2200W 200VAC to 240VAC ±10% 50/60Hz three-phase(option)

AC input power(MAX) *option

AC IIIput power (MAX)	option	
AC input voltage Output power	100V to 120V	200V to 240V
30W	90VA	* 90VA
60W	130VA	* 130VA
100W	200VA	* 200VA
150W	270VA	* 270VA
300W	520VA	* 520VA
600W	* 1300VA	1300VA
1200W		2600VA
2200W(1Ø)		2800VA
*2200W(3Ø)		2800VA

Rush current

30A(≦10ms)	30A(≦10ms)
1Ø 200V to 240V	3Ø 200V to 240V
50A(≦10ms)	50A(≦10ms)
	1Ø 200V to 240V

Output Voltage

: 10-turn potentiometer on front panel Local

Control

Remote: External control voltage 0 to 10Vdc(input impedance more than $1M\Omega$) or by external $5k\Omega$ potentiometer

Voltage Regulation

Line: ±50ppm for ±10% input line change

Load: 50ppm for 10% to 100% load change / 50ppm +400mV for 10% to 100% load change (2200W models)

Ripple

less than 0.1%p-p

0.3%p-p+1Vrms(2200W models)

0.1%p-p+1Vrms(2200W models with -L(200V3P) option)

Stability Temperature Coef. 0.01% / Hr 0.01% / °C

Output Display

Output voltage : 3.5-digit digital meter ±1999 Output current : 3.5-digit digital meter 1999

Monitor Output

Voltage monitor : 10V / maximum output voltage (output impedance $1k\Omega$)

Current monitor : 10V / maximum output current (output impedance $1k\Omega$)

Protections

Over voltage protection. (Cut-off when 110% of rating, manual recovery)

Over current protection. (high-voltage cut-off, manual recovery or recovery by remote set) Protection against output short-circuit and arc discharge.

Over temperature protection. (output cut-off, manual recovery)

Other Functions

Remote switch ON / OFF(by external relay)*1

The output will be on only when both output switch on front panel and remote switch are ON.

Door switch(by external relay)

Output status signal output(by internal relay)

Remote reset (Over current cut-off protection mode shall be reset by remote signal.)

Temperature

Operating temp. Storage temp. -20°C to +70°C

Humidity 20% to 80%RH (no condensation)

Accessories

AC line input cable 2.5m(1)

Shielded HV output cable 2.5m (flying lead)(1)*2

Instruction manual(1)

■ INPUT / OUTPUT CABLE

Input cable

CABLE TYPE 1 125V / 10A	CABLE TYPE 3 250V / 10A	CABLE TYPE 5 250V / 25A	CABLE TYPE 6 * 250V / 25A
for 30W to 300W models	for 30W to 300W models (with -L(220V) option)	for 600W, 1200W, 2200W models	for 2200W models (with -L(200V3P) option)

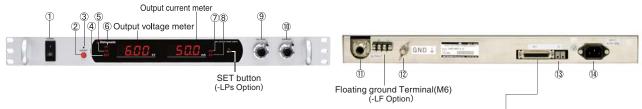
Output cable

CN-□-MHVP	CN-15PR -MHVP	
for 30W to 1200W / 2200W(≧2kV) models	for 2200W (1kV,1.5kV) models	
ℓ = 2.5m Flying lead (Shielded cable) Depending on outoput voltage, length will be varied. Please contact nearby sales office for details.	φ11mm 90mm Σφ9mm ℓ= 2.5m Crimp terminal : M6 (shielded cable)	

^{*1:} If you will frequently turn ON / OFF of output by a remote switch, please contact us before purchasing.
*2: When you need to extend the length of the cable, please choose -L(3m), -L(5m) or -L(7m) option (→P.7). Or, please ask us for production separately.

^{*}Please purchase it separately.

Normal operation Output $\bigcirc \rightarrow \bigcirc \rightarrow \bigcirc \rightarrow \bigcirc$, conversely to stop operation.

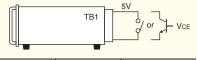


- ① **POWER ON / OFF switch :** This has priority ober all operations for safety.
- ② OUTPUT ON / OFF button: Used for urgent OFF or resume the output when remote mode as well as output ON / OFF when local mode. Also used for manual recovery of protecton function. (Output is possible only when OUTPUT button is ON even when remote)
- ③ OUTPUT ON display LED: Lights up in a status when output is possible or when output. (Goes off when cut off by protection circuit)
- External control display: Lights up during external cotrol.
- ⑤ Door switch display LED: Lights up when door switch operates.(output cut off during the light is on)
- ⑥ Over temperature protection display LED: Lights up when internal part reaches excess temperature by abnormal heating.
- ① Operation mode display LED: Lights up during operation of constant voltage.
- ® Operation mode display LED: Lights up when over current is cut off. Lights up during operation of constant current (unit with -LC option).
- Output Voltage adjustable potentiometer(10-turn,lockable)
- (10-turn,lockable)

- ① Output connector (Matsusada's property)
- 12 GND Terminal(M6)
- 3 S2 switch
- (4) AC input connector up to 300W models : Inlet 600W to 2.2kW models : Terminal(M4)

REMOTE CONTROL CONNECTOR (TB1) D-Sub 25pin female (mating connector enclosed). Use for GPIB connection too.

REMOTE/LOCAL change



Mode	Output relay Open colle	
REMOTE	SHORT	Vce ≦ 0.4V
LOCAL	OPEN	Vce ≧ 2V

TB₁

Output relay

SHORT

OPEN

Sink Current ≧ 10mA

Output

ON

OFF

Sink Current ≧ 10mA

REMOTE HV ON/OFF

OUTPUT CONTROL

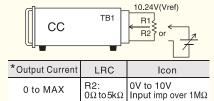


TB1

10.24V(Vref)

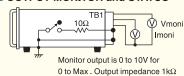
R1 <

Remote analog programming



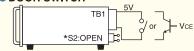
- *Model with -LC
- It is possible to conduct control with the combination of Vcon and output current setting potentiometer ® of front panel.
- Open circuit (fixed at MAX value) is possible by entering Vref.

OUTPUT MONITOR and STATUS



Internal relay of status output turns ON in a status when output is possible or when output (entrained to OUTPUT ON display LED). Contact open-circuit voltage 30V, permissible current 100mA max.

DOOR SWITCH



It is possible to output in exernal relay short or a status of VCE less than 0.4V. Output will be cut off when open or 2V or more. To resume the output again, turn OUTPUT button ON after resetting by turning OUTPUT button OFF in a status of short or less than 0.4V.

Sink Current ≥ 10mA

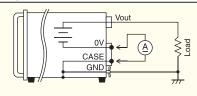
*Door switch become effective when S2 terminal is open

-LF option: FLOATING GROUND TERMINAL (M3)

Open collector

Vce ≤ 0.4V

Vce ≧ 2V

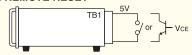


Case GND"CASE" and power supply GND"0V" can be isolated up to 50V. Minimal current in load can be measured by measuring the current between these 2 points to avoid the effect of ground noise.

*Not for floating applications

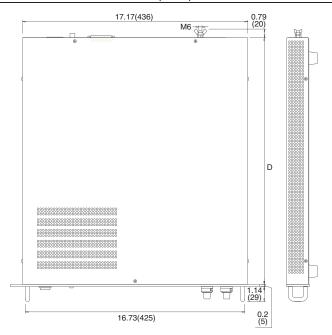
*All equipments that connect to Remote Control Connector (TB1) must be on floating ground in case this feature is intended to use.

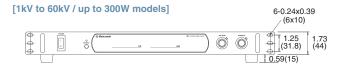
REMOTE RESET



Output relay	Open collector	Timing
OPEN	Vce ≧ 2V	
SHORT	Vce ≦ 0.4V	} }
Sink Current	Reset	

DIMENSIONS inch(mm)

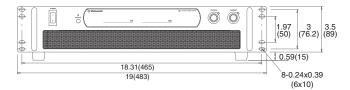




[1kV to 60kV / 600W, 1200W models] [80kV to 120kV / 30W to 1200W models]



[2200W models]



MODEL	D	
1kV to 60kV	18.82(478)	
80kV to 120kV	23.86(606)	

OPTIONS

-LStc	Constant Curreent status signal
-------	---------------------------------

Constant Current mode or when OCP(Over Current Protection) activated, the open collector will turn on.(Vce > 2V)

-LStv Constant Voltage status signal

When operation mode is Constant Voltage mode, the open collector will turn on.(Vce > 2V)

-LC Constant voltage and constant current*2

Current regulation 0.05%

(-LC option eliminates Overload Trip function)

-LF Floating ground(withstanding voltage of 50Vdc)*1

Used when measuring minimal current in load.

All equipments that connect to Remote Control Connector (TB1) must be on floating ground in case this feature is intended to use.

(Cannot be used for the purpose of floating high-voltage power supply.

-LMs Master slave control (600W, 1.2kW and 2.2kW models only)*1*2*3

Maximum of 4 slave units can be controlled with one master unit.

-LW Slow start*

Takes about 10 seconds to reach a set voltage from when OUTPUT switch, remote switch and remote switch are turned on.

-L(220V) 200VAC to 240VAC single phase input.(30W to 300W models only)

-L(115V) 100VAC to 120VAC single phase input.(600W models only)

-L(U) Input voltage switch over 100VAC to 120VAC/200VAC to 240VAC

single phase input.

Internal switch over.(30W to 300W models only)

-L(200V3P) three-phase input (2200W models only)

-L(3m) The length of HV output shielded cable is changed to 3m.

-L(5m) The length of HV output shielded cable is changed to 5m.

(only for ≤ 40kV models)

-L(7m) The length of HV output shielded cable is changed to 7m.

(only for ≤ 15kV models)

-LPs Setting value display

The set voltage value and the set current value are displayed on the meter, while you pressing the SET button on the front panel.

(This button is attached only when -LPs option is chosen.)

And also, Slave unit is equipped with -LC option, therefore, if Slave unit is used indivdually, out will be either CV or CC.

And also, Master unit and each Slave unit equipped with -LC option, therefore, if each unit is used individually, out will be either CV or CC.

When ordering, suffix the above option mark to the model number. $% \label{eq:control_eq} % \label{eq:control_eq}$

<e.g> AU-15P80-LCFMsPsStcStvW(7m)

AU-30N10-LCFStcStvW(U)(5m)

AU-100R22-LCFMsStcStvW(200V3P)(3m)

Alphabetical, input voltage and cable length order

 * Digital control option is available with combination of CO series.

^{*1} In case selecting -LMs option with -LF option or -LW option, all AU power supplies which connected as Master-Slave, need to equip -LF option or -LW option.

^{*2} In case power supply operate as cut off the output when overcurrent with Master-Slave connection, do not select -LC option for Master unit(the other options can be selected), and select -LC option for only Slave unit(the other options can be also selected together). Combinations other than above, cut off the output when overcurrent will not work.

^{*3} In case you operate power supplies with CV/CC mode under Master-Slave connection, select -LC option for Master unit and all Slave units (the other options can be also selected together). Combinations other than above, CV/CC will not work.



USA/Canada: +1-888-652-8651 other countries: +81-6-6150-5089

Customer Inquiry Sheet (AU series)

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 requ	irement / comment		
■ Please fill in below	V.		
Address:			
Company:			
Dept.:		Title:	
Name:		I	
Tel:		Fax:	
E-mail:			

We warrant the specification, unless otherwise specified, at max. rated output after warm up, and scope of application is between 10% and 100% of max. rated output. 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. We will not inspect, adjust or repair any of our power supply products in the field or at any customer site. If you suspect that there has been a power supply failure in the field, please inspect your whole unit by yourself in an effort to determine that the problem is, in fact, arising out of our power supply products. If it is found that the problem is arising out of such power supply product after inspection, please contact your local sales office for additional troubleshooting. A "Return Merchandise Authorization" is required in case the power supply must be sent back to the factory in Japan for inspection and repair. 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 intrastructure facility, medical equipment, etc.). The use under such environment is not covered by this warranty and may require additional design and manufacturing processes. No modification or supplement of this warranty shall be binding unless in writing and signed by a duly authorized officer of Matsusada. Matsusada reserves the right to make any changes in the contents of catalogs or specifications at any time without advance notice. Due to compelling reason such as unavailability of components used, products might be un available or unable to repair. The products specified in catalogs or specifications are designed for use by the person who has enough expertise or under the control of such person, and not for general consumers. Schematics of products shall not be submitted to users. Test result or test data for the products shall be available upon request with charge.

Make sure you read the specification in the latest catalog before you order. Contact nearby sales office for the latest catalog. PLEASE SEE THE LINK BELOW FOR THE COMPLETE WARRANTY TERMS



Website www.matsusada.com

San Jose Office: 2570 N.First Street Suite 200 San Jose, CA 95131 North Carolina: 5960 Fairview Rd. Suite 400, Charlotte, NC 28210 International Office: Osaka-City, Osaka Japan Tel: +1-408-273-4573 Fax: +1-408-273-4673 Office Tel: +1-704-496-2644 Fax: +1-704-496-2643

Tel: +81-6-6150-5088 Fax: +81-6-6150-5089

Boston Office: 859 Willard Street, Suite 400, Quincy, MA 02169 Tel: +1-781-353-6407 Fax: +1-781-353-6476 Headquarters: 745 Aoji-cho Kusatsu Shiga 525-0041 Japan