

Ultra High Speed HV Amplifier

Additional output ranges for solar battery panel evaluations!



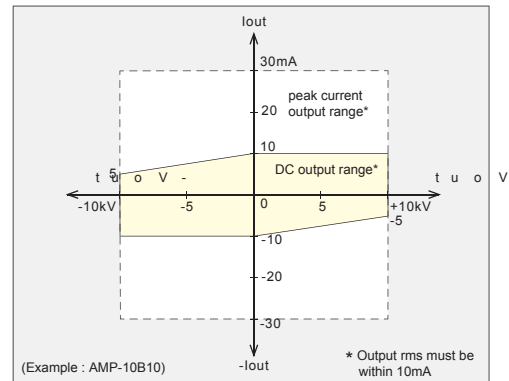
AMP series is an ultra high speed high voltage amplifier. It realized as fast as $700V / \mu s$ even with load, and approximately 2 times faster than existing models. With the capability of peak current output of 3 times, it suppress the distortion of waveform when with capacitive load.

For measuring voltage and / or current

When the voltage at load is lower than the rated maximum output of AMP series, constant voltage and high speed operation is possible by sinking the output current with current sink feature.

As example of solar battery application, cell / panel voltage and current data can be obtained by logging the change of current sink by changing the voltage to solar battery cell / panel gradually. At that time with its high slew rate of $300v / \mu s$ AMP can get more detailed sampling. AMP is a bi-polar power supply with 0 crossing, and so, it can measure the output short current at 0V. Moreover, it can output peak current of 3 times more than rated current(at DC). (see right chart)

OUTPUT RANGE



Suitable for the trend to higher voltage for cell / panel evaluation

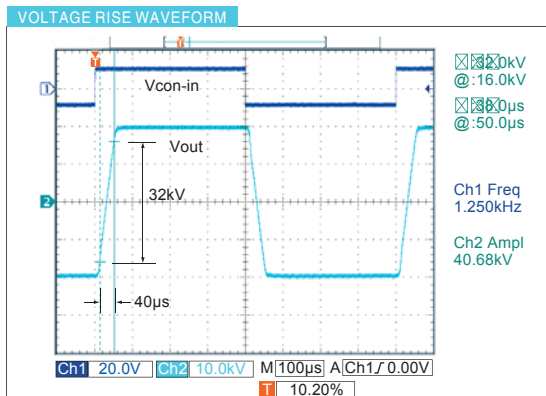
Voltage rating required for solar battery(panel) evaluation is getting higher and higher. AMP series added more lineups ranging from $\pm 600V$ to $\pm 30kV$ to meet the demand for evaluation of higher voltage solar battery panel as well as evaluation of cell / panel with wider output range.

APPLICATION

- Solar battery panel evaluations
- Corona discharge
- Electrophotography process
- Electroviscosity fluid
- Various electrostatic testing
- Beam deflection
- Electrostatic chuck
- Breakdown voltage testing
- Lighting discharge tube

High speed response of slew rate $700V/\mu s$ *

*Change model to model



Slew rate with actual load is as high as $700v / \mu s$, and solve the problem of "When actual operation with load, the response become slow."

Ideal for higher speed printer or material evaluation testing.

Example of waveform : model AMP-20B20
 Operation condition : V_{con-in}= $\pm 10V$ V_{out}= $\pm 20kV$
 R_L= $1M\Omega$ F=1.25kHz
 Slew rate: SR= $32kV / 40\mu s > 700V / \mu s$

LINEUP

Output Voltage	Output Current (DC+AC)	Max. output power	MODEL	Slew Rate	Frequency Response(-3db)*1	
					Full scale *2	Small bandwidth (10% of full scale)
-600V to +600Vdc	±200mA max and ±400mApk 1mS max	1200W	AMP-0.6B2000	≥ 300V / μs	DC to 40kHz	DC to 60kHz
-1kV to +1kVdc	±1200mA max and ±2400mApk 1mS max	1200W	AMP-1B1200		DC to 30kHz	DC to 50kHz
-2kV to +2kVdc	±200mA max and ±400mApk 1mS max	400W	AMP-2B200	≥ 700V / μs	DC to 20kHz	DC to 50kHz
-5kV to +5kVdc	±80mA max and ±160mApk 1mS max	400W	AMP-5B80		DC to 10kHz	DC to 30kHz
-10kV to +10kVdc	±10mA max and ±30mApk 1mS max	100W	AMP-10B10		DC to 7kHz	DC to 25kHz
	±40mA max and ±120mApk 1mS max	400W	AMP-10B40			
-20kV to +20kVdc	±20mA max and ±60mApk 1mS max	400W	AMP-20B20		DC to 4kHz	DC to 20kHz
-30kV to +30kVdc	±10mA max and ±30mApk 1mS max	300W	AMP-30B10	≥ 360V / μs	DC to 1kHz	DC to 5kHz
-40kV to +40kVdc	±20mA max and ±40mApk 1mS max	800W	AMP-40B20		DC to 1kHz	DC to 5kHz

*1 Typical value at sine wave operation with resistive load.
 *2 At frequency of full scale, output voltage may be clipped by power limitation.
 *3 CE marking model corresponds to low voltage directive.

SPECIFICATIONS

Input voltage / current 230VAC±10% 50 / 60Hz single phase 8Atp(AMP-0.6B2000, AMP-1B1200)
 230VAC±10% 50 / 60Hz single phase 5Atp(AMP-2B200, AMP-5B80, AMP-10B40, AMP-20B20, AMP-30B10)
 200V to 240VAC ±10% 50 / 60Hz single phase 10Atp(AMP-40B20)
 100V to 240VAC ±10% 50 / 60Hz single phase 3.5Atp@100VAC(AMP-10B10)

Output voltage control External control voltage Vcon-in = -10V to +10V *1
 (Input Impedance greater than 10kΩ)

DC Bias Front panel 10-turn potentiometer enables setting between -100% and +100%

Regulation Line : ±0.05%(115V or 230V ±10% input change)
 Load : 0.05%(10% to 100% load change) *2

Ripple Less than 0.02% +1Vp-p *2

Stability 0.016% / Hr typ *2

DC output voltage display 3.5-digit digital meter *3

Output voltage monitor -10V to +10V from front panel BNC terminal
 (Output impedance 1kΩ)

Output current monitor -10V to +10V(10Vpeak) from front panel BNC terminal
 (Output impedance 1kΩ. Up to 3kHz bandwidth)

Remote switch ON/OFF Output ON / OFF with external contact signal
 (Short : ON, Open : OFF)

Protection Over current protection with cut off, over voltage protection
 output short circuit protection, arc protection and blackout protection.

Operating Temp. 0°C to +40°C

Storage Temp. -20°C to +60°C

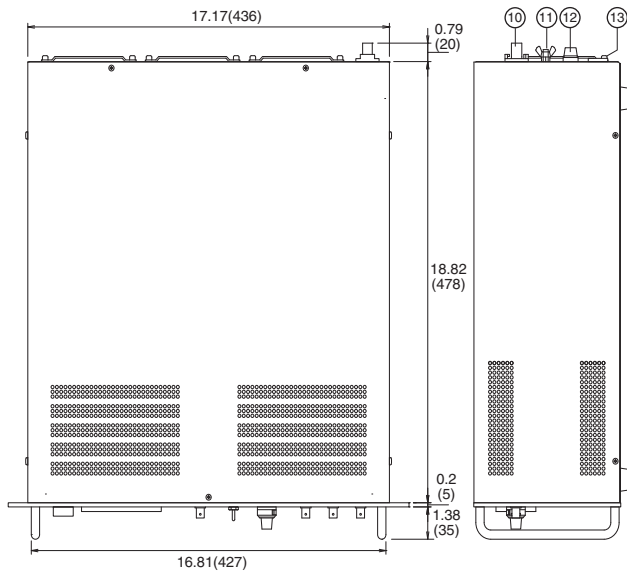
Humidity 20 to 75%RH(no condensation)

Accessories Input AC cable 2.5m (1)
 ■With 3-pin connector for 115VAC input ■Flying lead(open end) for 230VAC input
 Output HV cable flying lead 1.5m (1)
 Instruction Manual (1)

*1 Offset voltage at Vcon-in = 0V is less than 0.1% of rated output.
 *2 At DC operation with resistive load maximum rated output.
 *3 At DC output : DC voltage display. At more than 10Hz output : Average voltage display

AMP series

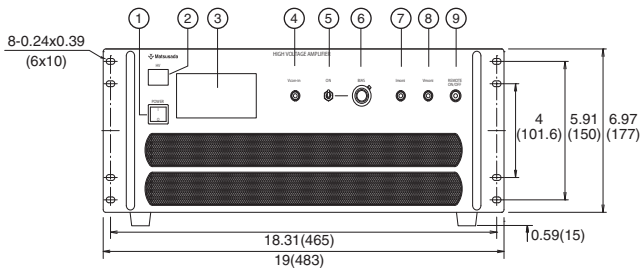
DIMENSIONS inch(mm)



- ① **POWER ON / OFF switch** Have priority to all other operations for safety reason.
- ② **HV ON / OFF switch** To be also used to reset output cutoff status due to output over load, output short circuit protection or black out protection. Remote switch operation is possible only when output switch is on.
- ③ **OUTPUT voltage meter**
- ④ **External control voltage (Vcon-in) input connector** BNC receptacle
- ⑤ **Bias ON/OFF switch**
- ⑥ **Bias setting dial** 10-turn potentiometer
- ⑦ **OUTPUT current monitor terminal** BNC receptacle
- ⑧ **OUTPUT voltage monitor terminal** BNC receptacle
- ⑨ **Remote ON/OFF terminal** BNC receptacle
- ⑩ **OUTPUT connector**
- ⑪ **Ground terminal** M6
- ⑫ **FUSE**
- ⑬ **AC inlet**

AMP-10B10
D=19.06(484)*
Weight : 23kg approx.

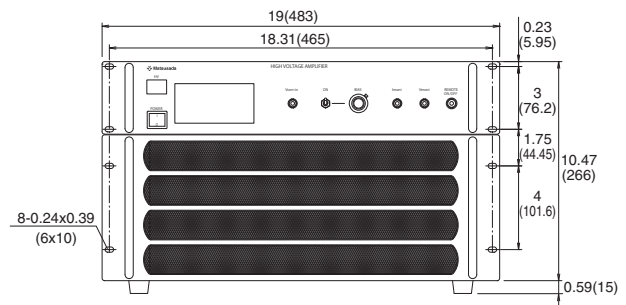
*Except projection



AMP-2B200, AMP-5B80
AMP-10B40, AMP-20B20
D=21.65(550)*
Weight : 28kg approx.

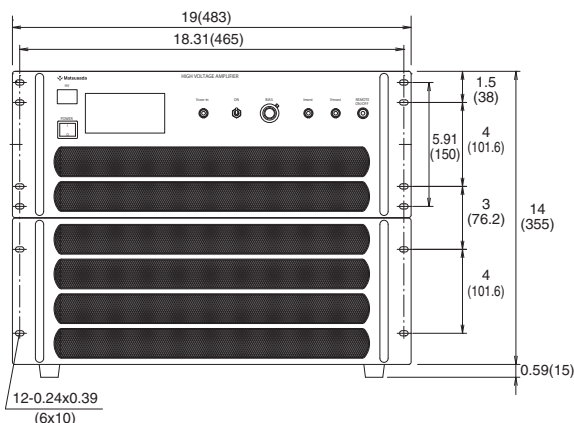
AMP-0.6B2000
D=24.02(610)*
Weight : 45kg approx.

*Except projection



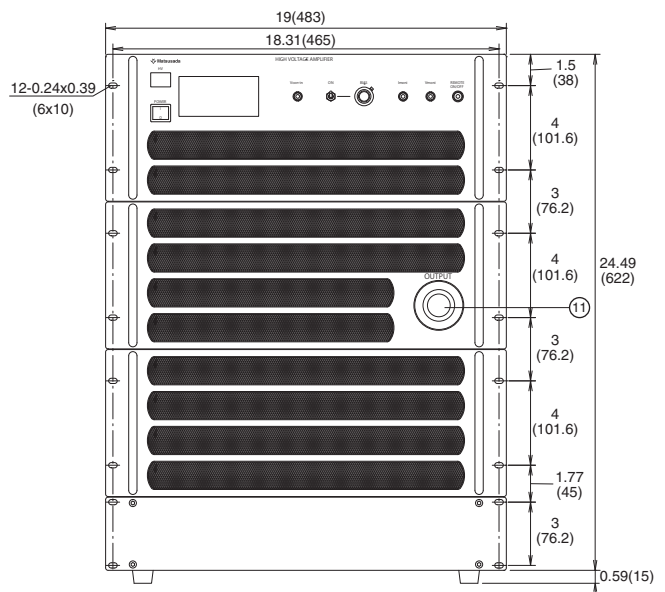
AMP-1B1200
D=24.02(610)*
Weight : 50kg approx.

*Except projection



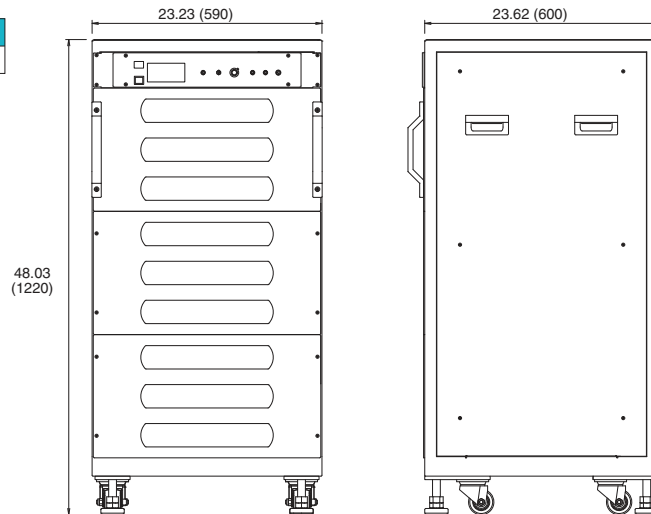
AMP-30B10
D=21.65(550)*
Weight : 50kg approx.

*Except projection



AMP-40B20
Weight : 160kg approx.

*Except projection



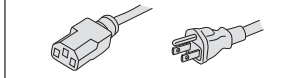
INPUT / OUTPUT CABLE

Input cable

[AMP-10B10]

CABLE TYPE 1 (Standard)*

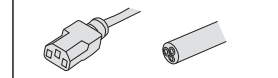
3-pin plug(Type-A) / Inlet type / 125V rated / Single phase(3-core) / Black



[300W and 400W models]

CABLE TYPE 3 (Standard)

Inlet type / Flying lead / 250V rated / Single phase(3-core) / Black



[800W,1200W models]

CABLE TYPE 5 (Standard)

M4 round terminalx3 / Flying lead / 250V rated /Single phase(3-core) / Black



The length is 2.5m for both.(Please see CABLE series catalog for details)

*CABLE TYPE 3 is needed separately when the input voltage is 200V to 240VAC.

Output cable

- 800V to 10kV models
 - ➔ CN-40-AHVP HV output cable 1.5m (standard)
 - ➔ CN-40-AHVP(5) HV output cable 5m (-L(5m) option)
- AMP-20B20
 - ➔ CN-40-AHVP TU* HV output cable 1.5m (standard)
 - ➔ CN-40 AHVP TU(5)* HV output cable 5m (-L(5m) option)
- AMP-30B10, AMP-40B20
 - ➔ CN-50-AHVP HV output cable 3m (standard)
- Less than 600V models
 - ➔ using terminal board output line 1.5m (standard)

*TU : With silicon tube

OPTION

-LOc	Adjustable cut-off current setting value * Limit setting value to trigger to cut off the output current becomes variable by adjusting the potentiometer on the front panel between the range 10% to 105% of the rated current.
-LC	Current limit * Output current will not be cut off but will be regulated by lowering the output voltage at a occurrence of overcurrent.
-LCc	Variable current limit * Output current will not be cut off but will be regulated by lowering the output voltage at a occurrence of overcurrent. The setting value to trigger to regulate the output current becomes variable by adjusting the potentiometer on the front panel between the range 10% to 105% of the rated current.
-LN	Cancellation of blackout protection
-L(5m)	HV output cable 5m (more than 1kV models except AMP-30B10 and AMP-40B20) Please note that using 5-meter long cable may decrease slew rate, response time, and distort output waveforms. Please see "Capacitive load" for details.

* These options cannot be selected together. Need to be selected either one.
When ordering, suffix -L mark(option mark) to the model number.
<e.g.> AMP-10B10-LCN(5m), AMP-2B200-LNOc(5m)

