

NEW

Suitable for applications requiring “low noise” and “high stability”

Low noise Compact High Voltage Power Supply

ES series

Max.output voltage : 1 kV to 5 kV / Max.output current : 0.6 mA to 15 mA / Max.output power : 3W, 6W, 15W

Low noise and high stability

Simple operation that thoroughly pursues ease of use

Wide lineup that can select the optimum one



ES series

High Performance High Voltage Supply thoroughly pursued “Compact” and “Low noise”



ES series is a handy high voltage power supply with compact size and high performance.

With its space saving compactness and light-weight it is suitable for the operation in the lab with limited space. Due to the low ripple and high stability, PMT is one of the suitable applications among many others. User-friendly operation and full protections offer the best match power supply for bench top experiment and as learning materials. With remote control functions, various interface options and many options it is well suitable for building systems too.

Features

**ULTRA-LOW RIPPLE·
HIGH STABILITY**

**OUTSTANDING
OPERABILITY**

**WIDE RANGE OF
LINEUP**

Lineup

Output Voltage	Output Current	Output Power	MODEL	Ripple
				(mVp-p)
0 to 1 kV	3 mA	3 W	ES-1*3	5
	6 mA	6 W	ES-1*6	
	15 mA	15 W	ES-1*15	
0 to 1.5 kV	2 mA	3 W	ES-1.5*2	5
	4 mA	6 W	ES-1.5*4	
	10 mA	15 W	ES-1.5*10	
0 to 2 kV	1.5 mA	3 W	ES-2*1.5	5
	3 mA	6 W	ES-2*3	
	7.5 mA	15 W	ES-2*7.5	
0 to 3 kV	1 mA	3 W	ES-3*1	10
	2 mA	6 W	ES-3*2	
	5 mA	15 W	ES-3*5	
0 to 5 kV	0.6 mA	3 W	ES-5*0.6	20
	1.2 mA	6 W	ES-5*1.2	

*P...Positive Polar output N...Negative polar output R...Reversible polar output

Applications

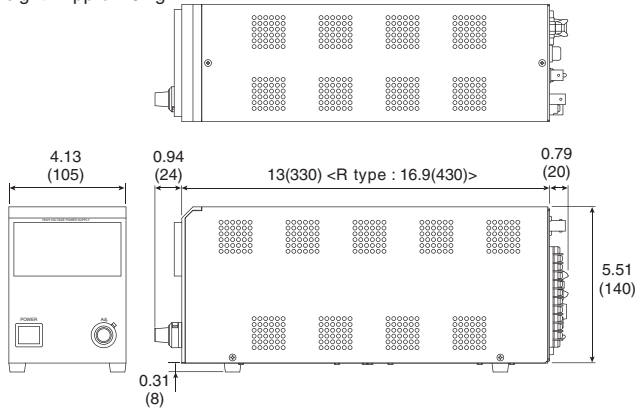
- PMT(Photomultiplier)
- MCP(Micro channel plate)
- Geiger counter
- Nuclear device
- For Biasing
- Electrostatic testing
- Breakdown voltage test
- General HV Testing

Specifications

Input voltage / current	115 Vac ±10%, 50/60 Hz, 1Ø 0.5 A typ.	Other Functions	External-interlock Enable to cut off HV output with external switch
Output voltage control	10-turn potentiometer on front panel		Remote 0 to 10 V programmable (Input impedance is greater than 10 kW)
Voltage Regulation	Line : ±0.005 % of maximum voltage for ±10 % input line change Load : 0.005 % of maximum voltage for full load change		Remote ON / OFF : GND = ON, OPEN = OFF Current monitor 10 V max, BNC connector Voltage monitor 10 V max, BNC connector
Stability	0.005 % / Hr, 0.01 % / 8 Hr	Output display	3.5-digit voltage meter ±1999
Temperature coef.	50 ppm / °C	Temperature	Operating : 0 to +40°C Storage : -20°C to +70°C Humidity : 20 % to 80 %RH(no condensation)
Protections	Over voltage protection (limit at approx.105 % of rated voltage) Over current protection (cut off high voltage output, manual recovery) Automatic protection against overload, short and arc by cutting off the output	Accessories	AC line input cable 3P 2.5 m(1) Shielded HV output cable 2.5 m(1) With BNC-HV(MHV) plug(SHV plug for -LSH option) Instruction manual(1)

■ Dimensions inch(mm)

Weight : Approx. 3 kg



■ Options

- LG Connector for USB, RS-232C, RS-485, GPIB interface. (need CO series controller)
- LSh SHV output connector (SHV type receptacle for output connector on rear panel) (Plug on HV output connector become SHV type)
- L(230V) Input Voltage 200 to 240 Vac $\pm 10\%$ 50/60 Hz 1 ϕ
- L(3m) } High voltage output shielded cable length change
- L(5m) } Please choose high voltage output cable length from 3, 5, 7 meters.
- L(7m) } (Please contact nearby sales office if specific length other than above)

When ordering, add the above option mark to the model number.
 <e.g.>ES-1P3-LGSh(230 V)(7 m)
 Alphabetical, input voltage and cable length order

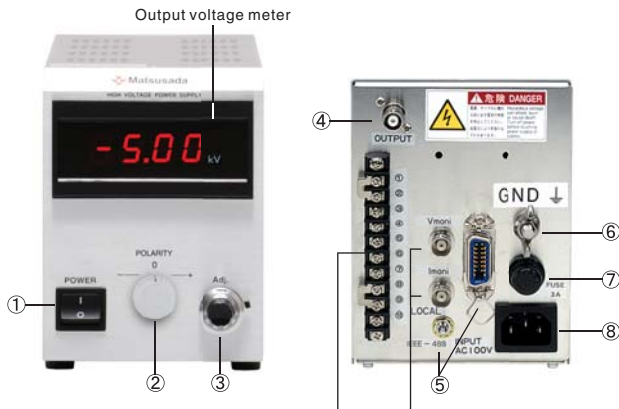
■ Input / Output Cable

*Please refer to each individual catalog for details of diameter etc. of each cable.

Input		Output				
Standard (Accessories)	with -L (230 V)option (Accessories)	Standard (Accessories)*	with -LSh option (Accessories)*	Standard (Selling separately)*	Standard (Selling separately)*	w=ith -LSh option (Selling separately)*
CABLE TYPE1 (with 3 pin plug)	CABLE TYPE3 (Flying lead)	CN-BNC-HVP	CN-SHV-HVP	CN-BNC-HVPP (terminal : BNC-HV)	CN-BNC-HVPPSP (terminal : SHV)	CN-SHV-HVPP (terminal : SHV)

■ Functions

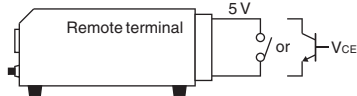
Normal operation ▶ Output①→②, conversely to stop operation.



- ① **POWER ON / OFF switch**
 Enable the output. Remote ON / OFF switch works only when front panel ON / OFF switch is on. This switch also reset the cut off mode.
- ② **Polarity change switch (for R type)**
- ③ **Output voltage setting potentiometer (10-turn lockable)**
 Change shall be made when POWER switch is off. Changing polarity with high voltage output can affect the performance of power supply.
- ④ **HV output connector BNC-HV(MHV) receptacle**
- ⑤ **Connector for GPIB adapter select switch(optional)**
- ⑥ **GND terminal M6**
- ⑦ **Fuse**
- ⑧ **AC inlet**

REMOTE TERMINAL

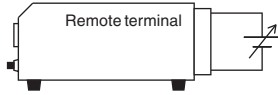
● REMOTE SWITCH ON/OFF*



Output	External relay	Open collector
ON	Short	$V_{CE} \leq 0.4\text{ V}$
OFF	Open	$V_{CE} \geq 2\text{ V}$

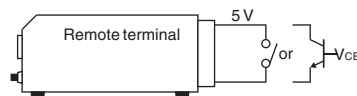
Sink Current $\geq 10\text{ mA}$

● OUTPUT CONTROL*



Output Voltage	Vcon
0 to MAX	0V to 10V Input imp $\geq 10\text{ k}\Omega$

● DOOR SWITCH

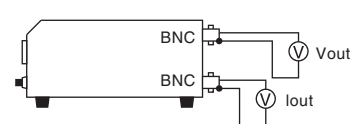


Sink Current $\geq 10\text{ mA}$

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

*-LG option : When switch ⑤ is on IEEE-488 side, remote switch and output control is not enable from remote terminal, but from only IEEE-488 operation.

● OUTPUT MONITOR BNC receptacle*



Vout : 0 V to $\pm 10\text{ V}$ (0 to +10 V)
 [standard] Monitor polarity equals output polarity.
 [-LG option] Positive polarity regardless of HV polarity.

Iout : 0 V to +10 V
 output Imp. is 1 k Ω .

When selecting -LG option, it will output whether switch ⑤ is on or off.