



# Matsusada Precision

## ES series 1kV to 5kV / 3W to 15W

《USB》《Ethernet》《RS-232C》《RS-485》《GPIB》



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

ES series is a high voltage power supply with compact design and simple operation. In addition to those features, the output ripple noise is as small as 5mVp-p, so ideal solution for such applications as PMT or Geiger counter, which are vulnerable to faint noise.

#### OUTSTANDING OPERABILITY

Simple design with only power switch and voltage meter for standard operation, and no complicated setting or operation is required. Simple but the potentiometer is 10-turn and the digital meter is 3.5 digit for "certain setting".

#### WIDE RANGE OF LINEUP

Wide output range from 1kV to 5kV, total 42 different models. No need to chose a product with over specifications hence avoiding wasted investment.

### APPLICATIONS

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

### LINEUP

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

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

### SPECIFICATIONS

**Input voltage** 115Vac ±10%, 50/60Hz, 1Ø 0.5A typ.

**Output voltage control** 10-turn potentiometer on front panel

**Voltage Regulation** Line : ±0.005% of maximum voltage for ±10% input line change  
Load : 0.005% of maximum voltage for full load change

**Stability** 0.005% / Hr, 0.01% / 8Hr

**Temperature coef.** 50ppm / °C

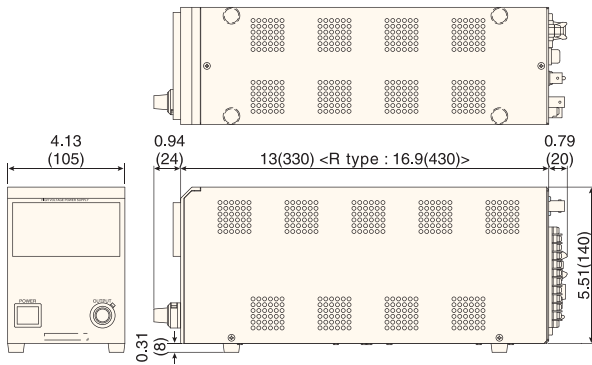
**Output display** 3.5-digit voltage meter ±1999

**Protections** Automatic protection against overload, short and arc by cutting off the output

**Temperature** Operating : 0 to +40°C  
Storage : -20°C to +70°C  
Humidity : 20% to 80%RH(no condensation)

**Accessories** AC line input cable 3P 2.5m(1)  
Shielded HV output cable 2.5m(1)  
With BNC-HV(MHV) plug(SHV plug for -LSh option)  
Instruction manual(1)

## DIMENSIONS inch(mm)



## INPUT/OUTPUT CABLE

Input	Standard		CABLE TYPE1 (with 3 pin plug)
	with -L(230V) option		CABLE TYPE2 (Flying lead)
Output	Standard		CN-BNC-HVP
	with -LSh option		CN-SHV-HVP
	Standard(Other)		CN-BNC-HVPP (terminal BNC-HV)
	Standard(Other)		CN-BNC-HVSP (terminal SHV)

## OTHER FUNCTIONS

- External-interlock  
Enable to cut off HV output with external switch
- Remote 0 to 10V programmable  
(Input impedance is greater than 10kΩ)
- Remote ON/OFF : GND = ON, OPEN = OFF
- Current monitor 10V max, BNC connector
- Voltage monitor 10V max, BNC connector

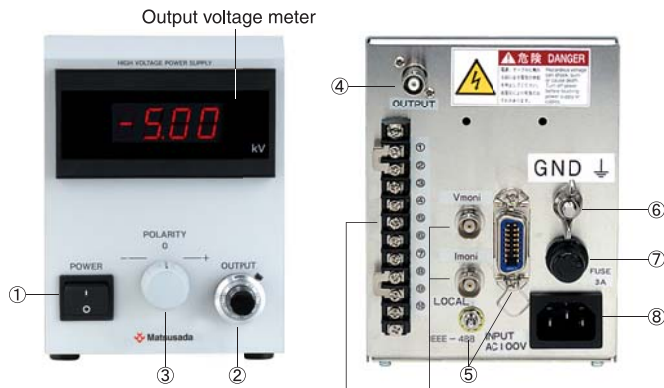
## OPTIONS

- 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 240Vac ±10% 50/60Hz 1Ø
- 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, suffix the above option mark to the model number.  
<e.g.>ES-1P3-LGSh(230V)(7m)  
Alphabetical, input voltage and cable length order

## FUNCTIONS

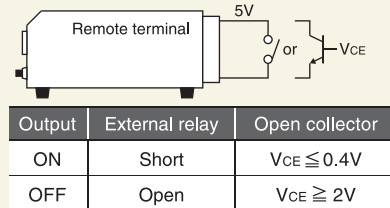
Normal operation: Output ①→②, conversely to stop operation.



- 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.
- Output voltage setting potentiometer(10-turn lockable)**
- Polarity change switch(for R type)**  
Change shall be made when POWER switch is off. Changing polarity with high voltage output can affect the performance of power supply.
- HV output connector BNC-HV(MHV) receptacle**
- Connector for GPIB adapter select switch(optional)**
- GND terminal M6**
- Fuse**
- AC inlet**

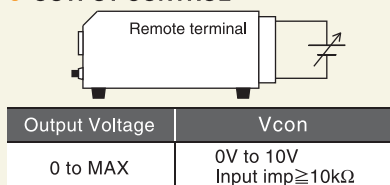
### REMOTE TERMINAL

#### REMOTE SWITCH ON/OFF \*

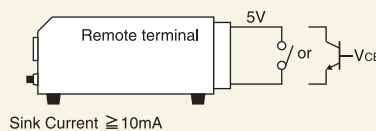


Sink Current  $\geq 10mA$

#### OUTPUT CONTROL \*



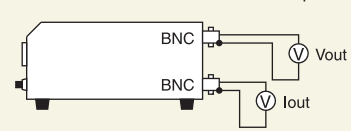
#### DOOR SWITCH



It is possible to output in external relay short or a status of  $V_{CE}$  less than 0.4V. Output will be cut off when open or 2V 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 0.4V.

\*-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:** 0V to ±10V (0 to +10V)  
[standard] Monitor polarity equals output polarity.  
[-LG option] Positive polarity regardless of HV polarity.

**Iout:** 0V to +10V  
Output Imp is 1kΩ.

\*-LG option: Generates output no matter switch ⑤ is on or off.

