



GENVOLT ESP03



High Frequency,
High Voltage Power Supply



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HIGH VOLTAGE POWER SUPPLIES

OVERVIEW



The ESP03 is a new type of high voltage power supply for electrostatic precipitators designed by Genvolt. This high frequency, high voltage power supply is an upgraded product of the traditional SCR low frequency power supply. It has achieved a qualitative change, thus showing a revolutionary significance in energy saving as well as increased efficiency.

When compared with the traditional SCR low frequency power supply, the ESP03 has many outstanding advantages, including: improved dust collection efficiency, low output voltage ripple, high average voltage, small size, light weight, integrated structure, high conversion efficiency and power factor, balanced three-phase supply and slight influence on power grid, etc.

The major switching devices of this high frequency and high voltage power supply integrate the most reliable components and are designed with full digital control and with a variety of communication methods.



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FEATURES

▲ **Improved Energy-saving:** With the high power conversion efficiency, this product has a smaller input power than that of the conventional power supply under the same power required by the electric field, thus realizing energy-saving. Besides, this product can greatly reduce the power of the electric field while ensuring the dust is fully charged with greater charging strength.

▲ **Balanced Three-phase Supply:** Designed for three-phase input, this product can realize a balanced three-phase supply. Moreover, it has a high power factor without mains pollution.

▲ **Enhanced Corona Power:** The output voltage ripple can greatly enhance the corona power, improve the charging capacity and drive velocity of the dust, thus enhancing the efficiency of dust collection. Moreover, the enhancement in corona power will cause an increase in corona current; as a result, the charging of the dust will be improved further to enhance the efficiency of dust collection. Therefore, this product is particularly suitable in environments with a high concentration of dust.

▲ **Better Power Adaptation:** This product has a better power adaptation compared with the low frequency power supply. Its output is composed of a series of high-frequency impulses, so this product can provide the most suitable voltage waveform according to the operating condition of electrostatic precipitators. For the pulse energisation, the width of supply pulse (duty ratio) can be adjusted. That is to say, this product has a more flexible duty ratio combination, so that the phenomenon of back corona can be controlled effectively. It is particularly suitable for the operating environments with high specific resistance dust.

▲ **Better Spark Control:** The spark of this product can be shut off quickly. Both the small spark energy and the fast-recovered electric field contribute to the improvement of the electrical field average voltage, thus enhancing the efficiency of dust collection.

▲ **Protective Function:** This product is equipped with many protective functions to ensure safe and reliable operation, including protection of input over-current, IGBT over-current, open circuit output, short circuit output, low DC bus voltage, IGBT and transformer oil, high tank pressure and low oil level.

▲ **Convenient Debug Interface:** Installed on the top of precipitators, this product has a LCD touch screen interface, allowing the user to turn it on/off, set the parameter and examining various operating parameters in-situ. Thus equipment debugging can be conveniently carried out.

▲ **Standard Communication:** The MODBUS protocol is applied to communicate with the host system, thus realizing the remote management and system integration.

▲ **Convenient Installation:** This product is smaller in size and more light weight due to its integrated structure. Directly installed on the top of precipitators, not only the space in the control room and most signal cables and controlling cables, but also installation costs can be reduced. The position of the high voltage outlet and the wheels are just the same with that of the low frequency rectifier transformer.



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TECHNICAL

Input and Output Parameters

Serial No	Installed Capacity	AC Input Voltage (V)	AC Input Current (A)	DC Output Voltage (kV)	DC Output Current (A)	AC Input Power (kVA)	DC Output Power (kW)
1	0.2A/72kV	380	24	72	0.2	15	14.4
2	0.4A/72kV	380	47	72	0.4	31	28.8
3	0.6A/72kV	380	71	72	0.6	46	43.2
4	0.8A/72kV	380	94	72	0.8	62	57.6
5	1.0A/72kV	380	118	72	1.0	77	72
6	1.2A/72kV	380	141	72	1.2	93	86.4
7	1.4A/72kV	380	165	72	1.4	108	100.8
8	1.6A/72kV	380	188	72	1.6	124	115.2
9	1.8A/72kV	380	212	72	1.8	139	129.6
10	2.0A/72kV	380	235	72	2.0	155	144
11	2.2A/72kV	380	259	72	2.2	170	158.4
12	2.4A/72kV	380	282	72	2.4	186	172.8
13	0.2A/80kV	380	26	80	0.2	17	16
14	0.4A/80kV	380	52	80	0.4	34	32
15	0.6A/80kV	380	78	80	0.6	52	48
16	0.8A/80kV	380	104	80	0.8	69	64
17	1.0A/80kV	380	131	80	1.0	86	80
18	1.2A/80kV	380	157	80	1.2	103	96
19	1.4A/80kV	380	183	80	1.4	120	112
20	1.6A/80kV	380	209	80	1.6	138	128
21	1.8A/80kV	380	235	80	1.8	155	144
22	2.0A/80kV	380	261	80	2.0	172	160
23	2.2A/80kV	380	287	80	2.2	189	176
24	2.4A/80kV	380	313	80	2.4	206	192



SERVICE CONDITIONS

1. The environment temperature shall be -20 to 40°C.
2. The gas around the equipment shall be free of conductive dust; gas insulating materials or gas corroding the metal and steam.
3. The alternating voltage shall meet the following specification: the waveform shall be a sine wave; the frequency shall be 50Hz; the wave range cannot exceed 2%.
4. This product cannot be placed in an explosive environment and cannot be sharply shocked or dropped. The vertical inclination cannot exceed 5%.
5. The ground wire of this product is a braided bare copper wire whose section is equal to or greater than 25mm² ($\geq 25\text{mm}^2$) or the galvanized band iron (3mm×30mm). The ground resistance is under 2Ω ($< 2\Omega$) so it can be connected to the ground securely.

Display of Operating and Setting Parameters

This equipment can display the operating and setting parameters below:

- ▲ Input primary voltage
- ▲ Input primary current and rated value
- ▲ Operating and setting values of secondary voltage
- ▲ Operating and setting values of secondary current
- ▲ Operating and setting values of transformer oil's temperature
- ▲ Operating and setting values of IGBT case's temperature
- ▲ Operating and setting values of flash-over frequency
- ▲ Setting value of power-on time for pulse energisation
- ▲ Setting value of power cycle for pulse energisation
- ▲ Setting value of operation mode

Protective and Warning Functions

This equipment possesses the following protective and warning functions:

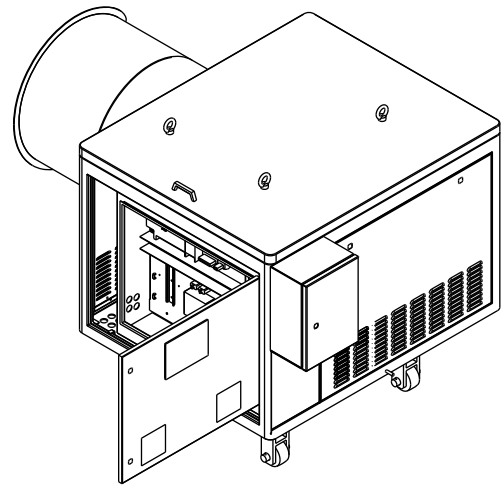
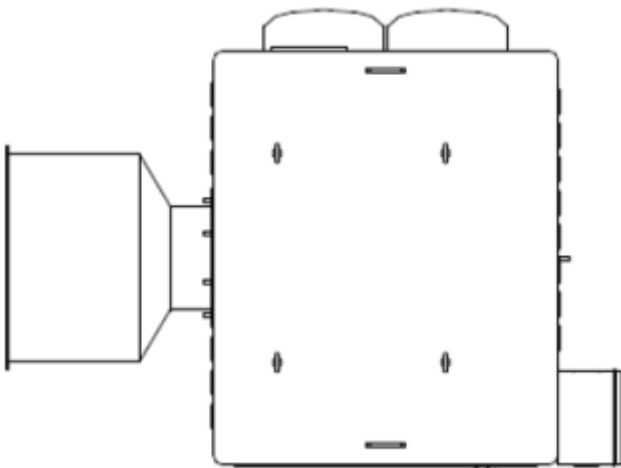
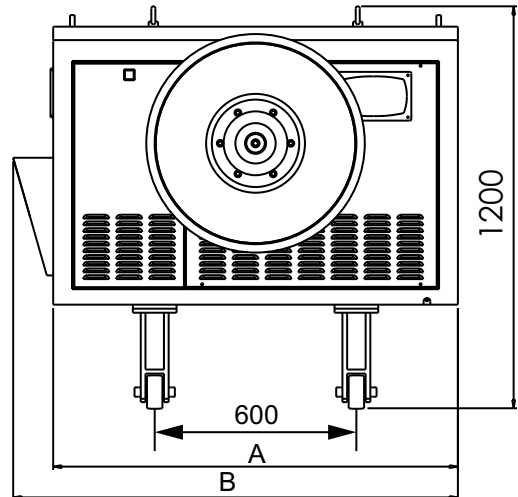
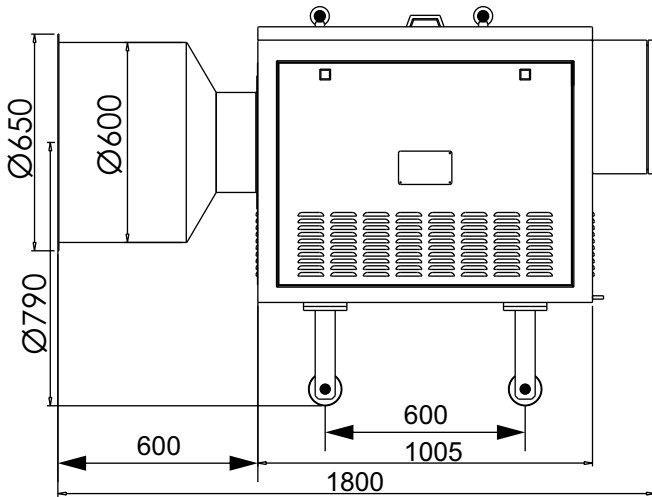
- ▲ Open circuit output protection
- ▲ Short circuit output protection
- ▲ Low DC bus voltage protective alarm
- ▲ Over-current protective alarm for Input primary current
- ▲ Pre-alarm for excessive transformer oil temperature
- ▲ Protective alarm for excessive transformer oil temperature
- ▲ Protective alarm for excessive IGBT case temperature
- ▲ Protective alarm for excessive IGBT temperature
- ▲ Over-current protective alarm for IGBT
- ▲ Protective alarm for high transformer tank pressure
- ▲ Protective alarm for low transformer oil level



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DIMENSIONS



Note: The trundle can rotate 90°

Specification	A	B	
0.4-1.0A/(60-80)kV	905	1025	495
1.2-1.6A/(60-80)kV	1205	1325	685
1.8-2.0A/(60-80)kV	1205	1325	710
2.2-2.4A/(60-80)kV	1505	1625	920



UK Office:

Genvolt, New Road, Bridgnorth, Shropshire, WV16 6NN, United Kingdom

Tel: +44 (0) 1746 862 555

Email: info@genvolt.co.uk Website: www.genvolt.com

India Office:

Genvolt India Private Limited

806, Suratwala Mark Plazzo, Hinjewadi Village, Hinjewadi, Pune, Maharashtra - 411057, India

Email: supportindia@genvolt.co.uk Website: www.genvolt.in

Research and Development:

Genvolt Ltd

New road, Bridgnorth, Shropshire, WV16 6NN

Factories:

Genvolt Ltd

New road, Bridgnorth, Shropshire, WV16 6NN

Boher High Voltage Power Supplies Ltd (Genvolt China)

No. 79 Yandangshan Road, Suyu District, Suqian City, Jiangsu, China