ESD Series Programmable DC Power Supply



Features

- Single system up to 500KW, and parallel system to 2MW
- Output voltage up to 2000V(std), higher voltage can be customized
- Applications: battery simulation, battery test (-BSS option),
 PV simulation (-PV option)
- Program accuracy up to 0.1%
- Seamless transition between source and sink modes (-R option)
- Current rise time (10%~90%) <1ms (-BSS option)
- CC/CV/CP/CR mode available
- Regenerative DC load function (-LD option)
- Hardware & software for PV Simulation (-PV option)
- Low-Voltage operation mode (-ZV option)
- Master-Slave interface (-MS option)
- Use water-cooling (-W option)
- LAN/RS485 interfaces (standard), CAN/RS232/ATI interfaces (optional)
- Emergency stop button and indicators on front panel
- TFT-Touch panel operation
- Mod-bus/SCPI protocols
- Output contactor
- Output terminal insulation monitoring function (-INS option)
- Remote sense
- CE conformity

Overview

The Bripower ESD series is IGBT PWM switching DC power supply, which contains multi output power levels from 30KW to 500KW for single system, up to 4 individual systems can be paralleled to up to 2MW system. Output power level of customized system goes up to 4MW and above.

ESD series uses bi-directional design, which makes it possible to be used as DC power source or regenerative DC load. CV/CC/CP /CR operation modes are available for both sourcing and sinking.

ESD series abopts dual DSP+FPGA design, with powerful calculation and control capabilities, and can display and save measured values at 10K/s sampling. The ESD series abopts optical fiber communication and performs multiple monitoring and protection of all main components, communication connections and systems. it is the most reliable power supply product in the industry.

With touch panel on the front panel, users can control the power source through GUI software. System status indicators and emergency stop button are installed on the front panel. RS485 and LAN standard interface, optional RS232 and analog control interfaces are available for automated test applications.



With the -R option, the unit can operate in source and sink mode, It has the capability to return the energy fully back to the grid.

Re-generative DC Load -LD option¹

ESD series with -LD option can be used as regenerative DC electronic load. DC load simulation includes constant current, constant resistance, constant voltage, and constant power modes.

Low Voltage Operation Mode -ZV option

ESD series DC electronic load with -ZV option can produce large current that meets the requirements under the input condition close to 0.4V, which can evaluate the electrical characteristics of the fuel cell (such as VI), etc.

Automatic wide range Output

ESD series DC power supply has an automatic wide-range output function. Under the condition of rated output power, the output range of voltage/current can be adjusted, such as: high-voltage small current or low-voltage large current (also applicable in sink power mode). The same type of power supply can cover a wider range of power applications. ESD standard models provide $\times 1/\times 3/\times 4$ current. For customized power/voltage/current, please consult the factory.



<3ms (std) , <1ms (BSS Option)

<5ms (std) , <2ms (BSS Option)

<3ms (std) . <1.5ms (BSS Option)

Example:100KW,1000V,±400A

Fast current rising

ESD Series has excellent dynamic performance of current rising, which makes it ideal for battery test and battery simulation. Two versions are provided, and current rise time of each version is different.



Current Rise Time(10%~90%)T_{Rise}≤1ms(Example ESD 50-400-125-R)

Current Rise Time(10%~90%)

Current Rise Time(-90%~90%) Regulation Time(0-100%Load change)

Battery Test

ESD series DC power supply can be used for characterization of power battery packs. It is used to test the charging and discharging performance, temperature rise characteristics, and cycle life of the power battery pack. Through the GUI software, different charging and discharging profiles can be programmed, and test results are displayed in real time.



ESD series DC power supplies can simulate the charging and discharging characteristics of the power battery pack/package and provide a convenient and efficient testing method for the development and testing of new energy vehicle motors etc.

								Fault
utput Voltage		Out	put Current		_	_	Output Power	Output www
210.30 y		1	10.15 A				110.15 kw	ev
Mode Discharge 🔍	(ime(s) 2.0	-	V(V) 0.0	-			-	0000
While Voluge(V) V	CHIAI 0.0	-	C-IAI 0.0	*	NU.	1	Keyboard.	Our Car
Value 0.0	P+1kW(1 0.0		P-[kW] 0.0	\$	State	0.0		CVACCACP
Mode Rest 🗸	time(s) 2.0	•	V[V] 0.0	-	No	-	Terr of	Occ.
While Votage(V) ~	C+(A) 0.0	-	C (A) 0.0	*		•	Keyboard	Q°
Value 0.0	Pitkwg 0.0	4	P-tkwg ovo	÷	State	0.0		Battery Simul
Mode Rest	Time(s) 2.0	3	VIVI 0.0	-	-		T Value 1	Ô!¥
While Votage(V) ~	C+141 0.0	-	C-141 0.0	-	40		Reyobaro	
Value 0.0 😤	PrikW1 0/0		P [kW] 0.0	*	State	0.0		oppy
Mode Rest.	Time(s) 2.0	ē.	VIVI 0.0	4	-		Territ I	Power Chi
While Votage(V) ~	C+141 0.0	+	C-141 0.0	\$	no	*	Neyodard	
Value 0,0	PIEKWE 0/0	-	P-[kW] 0/0	-	State	0.0		20 Empor



PV Simulation (-PV Option)

With -PV option, ESD series power supplies can be used to simulate IV curve of various solar panels under various temperature and irradiance condition, and conduct static and dynamic MPPT tests according to EN 50530:2010.

File Setting Normal Mode	Battery Mode PV	/ Mode Wa	e Fault Q	luery About		×	File Setting N	ormal Mos	e Battery Mode	W Mode Wave	Fault Query A	About	×	File Setting	Normal M	ode Batter	y Mode P	/ Mode W	ave Fault Query	About		×
I-V Curve Setting Dynamic M	PPT Test Static	MPPT Test			PV Mo	de	I-V Curve Setting	Dynam	nic MPPT Test Stati	c MPPT Test			PV Mode	I-V Curve Set	ting Dyn	amic MPPT 1	Test Static	MPPT Test			PV Mode	
0- -0.2- -0.4-						RT-P[kW] 0 Pmax[kW] 0	0	I[A] 0	RT-P[kW] 0.00	n[%] 0.00	Pmax[kw] 0	Um[V]	Im[A] FF 0 0		R	r-P[kW] 0		Pmax	[kW] 0			Temp of Module(°C)
-0.6- -0.8- -1-		2000			1/11 CF	haracteristics 0 \$ Um[V] 640 \$ Pmax[kw] 500 \$	31					-12 -11 -10	PV1 PV2 Shadow Parameters of PV module	MPP_0.05 MPP_0.1 MPP_0.2	Uoc[V] 800.00 800.00 800.00	Isc[A] 0.00 0.00 0.00	Um[V] 640.00 640.00 640.00	Im[A] 0.00 0.00 0.00	Waiting time[S] 300 300 300	Duration[S] 600 600 600	ŋMppt[96]	Irradiance[W/m2] 1000 ‡ Pmax[kW]
10%-50% PDCn Test 30%-10	1000 1300 10% PDCn Test	Start-up and :	hut-down Te	st Init Irradiance	G(W/m2) 10	PPT Init MPPT Test	22.5 20- ₹ 17.5					-9 -8 Power	Temp of Module(*C) 25	MPP_0.25 MPP_0.3 MPP_0.5 MPP_0.75 MPP_1	800.00 800.00 800.00 800.00 800.00	0.00 0.00 0.00 0.00 0.00 0.00	640.00 640.00 640.00 640.00 640.00	0.00 0.00 0.00 0.00 0.00	300 300 300 300 300 300	600 600 600 600 600		0 💽
[W/m2/s] Number E 0.5 2 800 1 2 400 2 3 200 3 4 133 5 6 80 7 8 57 10 40 14 20 10 20 30 10 20 30 10 20	ID IS 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	[5] 800 400 200 133 80 57 40 29 20 13 0	[S] 10 10 10 10 10 10 10 10 10 10	(5) 300 300 300 300 300 300 300 300 300 30	[5] 3540 1940 1560 1444 1380 1372 1300 1080 900 760		25 125 10 7,5 2,5 0 -1 5	0 100	150 200 250 Volgaç	300 350 e(V]	400 450 500	-6 rpowj -5 -4 -3 -2 -1 530	Isc(A) 648 © Ump(V) 645 © Imp(A) 775 © Mode Select Mode 1 V			Eur ŋMppt 0	opean [%]	ŋMi 0	CEC	Stat	tic MPPT Init	Reset

Graphical User Interface

GUI software is installed in front touch panel, which uses Windows OS. The software provides following functions:

- Output settings and limits
- Sequence output settings
- Display measurements: voltage, current, power, etc.
- Capture, display and save output voltage and current waveforms.
- Display power source faults

ESD					- 🗆 X	Bri ESD		- 0
le Hardware Limits	s Sequence Mea	surement Wave	Fault AC Source			File Hardware Limits Sequence Me	asurement Wave Fault AC Source	
		Sequence	Mode		Connected	Sub System Status and Errors Main (DC Output Contactor ON/OFF	Circuit Errors	IGBT1 Error(Module1)
Output Voltage		Output Current	A	Output Power	Fault Cutput	Reserved	AD Error	IGBT2 Error(Module1)
V[V] 0.0 + Internal R[ohm] 0.00 +	C+[A] 0.00 ÷ C-[A] 0.00 ÷	P+[kW] 0.00 * P-[kW] 0.00 *	Duration[ms] 100.0 + Switch T[ms] 100.0 +	NO. 1 Keyboard	Source Sink CV CC+	Reserved Reserved	IGBT Error Overrun Error Communication Error	IGBT3 Error(Module1) IGBT4 Error(Module1) IGBT1 Error(Module2)
[V] 0.0 • nternal R[ohm] 0.00 •	C+[A] 0.00 ÷ C-[A] 0.00 ÷	P+[kW] 0.00 + P-[kW] 0.00 +	Duration[ms] 100.0 + Switch T[ms] 100.0 +	NO. 1 Keyboard	Occ- Ocp+ Ocp-	Reserved Reserved	AC Port Error AC Port Communication Error Output Switch Error	IGBT2 Error(Module2) IGBT3 Error(Module2) IGBT4 Error(Module2)
/[V] 0.0 • nternal R[ohm] 0.00 •	C+[A] 0.00 + C-[A] 0.00 +	P+[kW] 0.00 + P-[kW] 0.00 +	Duration[ms] 100.0 + Switch T[ms] 100.0 +	NO. 1 Keyboard	Apply Power On	Reserved	IGBT Overtemperature Error	Reserved Module1 Over Temperature1
V[V] 0.0 + Internal R[ohm] 0.00 +	C+[A] 0.00 + C-[A] 0.00 +	P+[kW] 0.00 + P-[kW] 0.00 +	Duration[ms] 100.0 ÷ Switch T[ms] 100.0 ÷	NO. 1 Keyboard	DC Output Output Switch		Reserved Reserved Reserved	Module2 Over Temperature2 Module2 Over Temperature1 Module2 Over Temperature2



Block Diagram



General Specification (customized unit specification will be shown in the quotation)

AC Input	
AC input Voltage	3P+N+PE,380VLL±10% (std)
Frequency	47-36HZ
Efficiency	≥90%
Power Factor	0.95
Output	
Output Modes	CV, CC, CP and CR
Power Level	Up to 500KW in single controller, 2MW max power available.Customizable
Voltage Ranges	Up to 2000V,Customizable
Current Ranges	please refer to the Standard Models Specification
Load Regulation	0.1%FS
Line Regulation	0.1%FS
Voltage Ripple	0.1%FS
Stability	0.1%FS
Current Rise Time (10%~90%)	<3ms (std), <1ms (BSS Option)
Current Rise Time (-90%~90%)	<5ms (std), <2ms (BSS Option)
Regulation Time (0~100% Load change)	<3ms (std), <1.5ms (BSS Option)
Voltage Accuracy	0.1%FS
Current Accuracy	0.3%FS
Power Accuracy	0.3%FS
Power Resolution	0. 02KW (~100KW), 0.1KW (100KW~500KW)
Voltage Resolution	0. 05V(~800V),0.1V(800V~2000V)
Current Resolution	0. 05A (~800A), 0. 1A (800A~1600A), 0.2A(1600A~3200A)
Over Current	120%, 60 seconds





Measurements	
Measurements accuracy Power	0.3%FS
Measurements accuracy Voltage	0.1%FS
Measurements accuracy Current	0.3%FS
Others	
Protection	OVP, OCP, OTP
CE Conformity	EN 61010, EN 61326
Cooling	Forced Air Cooling
Temperature	Operating: 0~40°C,Storage: -20~85°C
Operating Humidity	20-90%RH (None Condensing)

Standard Models Specification

Model	Power	Voltage	Current	Dimension (W*D*H mm)	Weight (kg)
ESD 100-500-200			200A	900*900*2200	980
ESD 100-500-600		500V	600A	2*900*900*1800	1280
ESD 100-500-800			800A	2*900*900*1800	1350
ESD 100-1000-100			100A	900*900*2200	980
ESD 100-1000-300	100KW	1000V	300A	2*900*900*1800	1200
ESD 100-1000-400			400A	2*900*900*1800	1250
ESD 100-1500-67		1500V	67A	900*900*2200	850
ESD 100-1500-200	-		200A	900*900*2200	900
ESD 100-1500-267			267A	900*900*2200	930
ESD 200-500-400			400A	3*900*900*1800	2100
ESD 200-500-1200		500V	1200A	5*900*900*2200	3200
ESD 200-500-1600	-		1600A	6*900*900*2200	3800
ESD 200-1000-200			200A	2*900*900*1800	1600
ESD 200-1000-600	-	1000V	600A	3*900*900*2200	2200
ESD 200-1000-800	200KW		800A	4*900*900*2200	2750
ESD 200-1500-133			133A	2*900*900*2200	1800
ESD 200-1500-400		1500V	400A	3*900*900*2200	2100
ESD 200-1500-533			533A	3*900*900*2200	2200
ESD 300-500-600			600A	3*900*900*2200	2400
ESD 300-500-1800			1800A	7*900*900*2200	4800
ESD 300-500-2400] 300KW	500V	2400A	9*900*900*2200	6000
ESD 300-1000-300		1000V	300A	2*900*900*2200	2000



ESD 300-1000-900	300kw		900A	4*900*900*2200	3400
ESD 300-1000-1200		1000V	1200A	5*900*900*2200	4100
ESD 300-1500-200		1500V	200A	2*900*900*2200	2100
ESD 300-1500-600			600A	4*900*900*200	3700
ESD 300-1500-800			800A	5*900*900*2200	4500
ESD 400-500-800		500V	800A	6*900*900*2200	4200
ESD 400-500-2400			2400A	10*900*900*2200	6400
ESD 400-500-3200			3200A	12*900*900*2200	7600
ESD 400-1000-400		1000V	400A	4*900*900*1800	3200
ESD 400-1000-1200	400KW		1200A	6*900*900*2200	4400
ESD 400-1000-1600			1600A	8*900*900*2200	5500
ESD 400-1500-267		1500V	267A	4*900*900*2200	3600
ESD 400-1500-800			800A	6*900*900*2200	4200
ESD 400-1500-1067			1067A	6*900*900*2200	4400
ESD 500-500-1000			1000A	6*900*900*2200	4600
ESD 500-500-3000		500V	3000A	12*900*900*2200	8500
ESD 500-500-4000	500KW		4000A	14*900*900*2200	9800
ESD 500-1000-500			500A	4*900*900*2200	3800
ESD 500-1000-1500		1000V	1500A	8*900*900*2200	6800
ESD 500-1000-2000			2000A	10*900*900*2200	8400
ESD 500-1500-333			333A	4*900*900*2200	3900
ESD 500-1500-1000		1500V	1000A	8*900*900*2200	6800
ESD 500-1500-1333			1333A	9*900*900*2200	7600

Model Configuration

ESD AAA-BBB-CCC-DDD/EEE

AAA: Power, KW

BBB: Voltage range, V

CCC: Current range, A

DDD: Option

EEE: Input configuration

AC Input Configuration

Please specify the input voltage(L-L) /208,Input Voltage 208V±10%, 3-phase /230,Input Voltage 230V±10%, 3-phase /380,Input Voltage 380V±10%, 3-phase /400,Input Voltage 400V±10%, 3-phase



Options

- -232 RS232 program interface
- -BSS Hardware and software for Battery simulation
- -CAN CAN-bus program interface
- -LD Regenerative DC load function
- -PV Hardware and software for PV Simulation
- -R Regenerative mode
- -ATI Analog control interface (0~5V)
- -ZV Low Voltage Operation Mode
- -MS Master-Slave interface
- -W Use water-cooling
- -INS Output terminal insulation monitoring function

Contact us

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About Bripower

Bridge Technology is a company focusing on business of power supplies and test systems for new energy applications. We are devoted to providing high quality products and solutions for customers.

Bridge Technology has a top-class R&D team in China, works on modularization and standardization power supplies and systems. We have sales, technical support, R&D and manufacture in Shanghai, Nanjing and Chengdu. Nanjing Bridge New Energy Technology was founded on Jan 12th, 2016, focusing on R&D and manufacturing Bripower brand power

systems, including bi-directional AC sources for grid simulation, bi-directional DC sources for battery simulation, and regenerative loads. The Bripower AC&DC power systems are widely used in new energy and related fields.