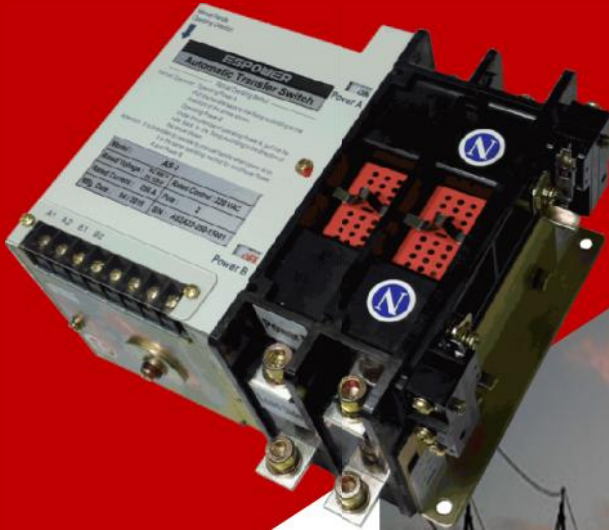


PRODUCT CATALOG 2018



ESPOWER

Power supply system & test equipment



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ESPOWER

Power supply system & test equipment

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Description

The "ESPOWER" Automatic Voltage Stabilizer (AVS) is electronic controlled and operated by Precision Servo Motor to distribute high precision AC voltage output. The front panel is designed for simple operation combine with LED Digital Meter which display for voltage and current output. It has excellent features, such as small waveform distortion, high efficiency, high power factor, free from the effect of frequency variation. It can be widely used in most situations where the voltage stabilization is required.

The AVS series Voltage has two regulator output, 110VAC and 220VAC which suitable for;

- ✓ Resistive load such as Heater, Lamp, etc.
- ✓ Inductive load such as Power Transformer, Electric Motor, Electric Drill, Air Conditioner, etc.

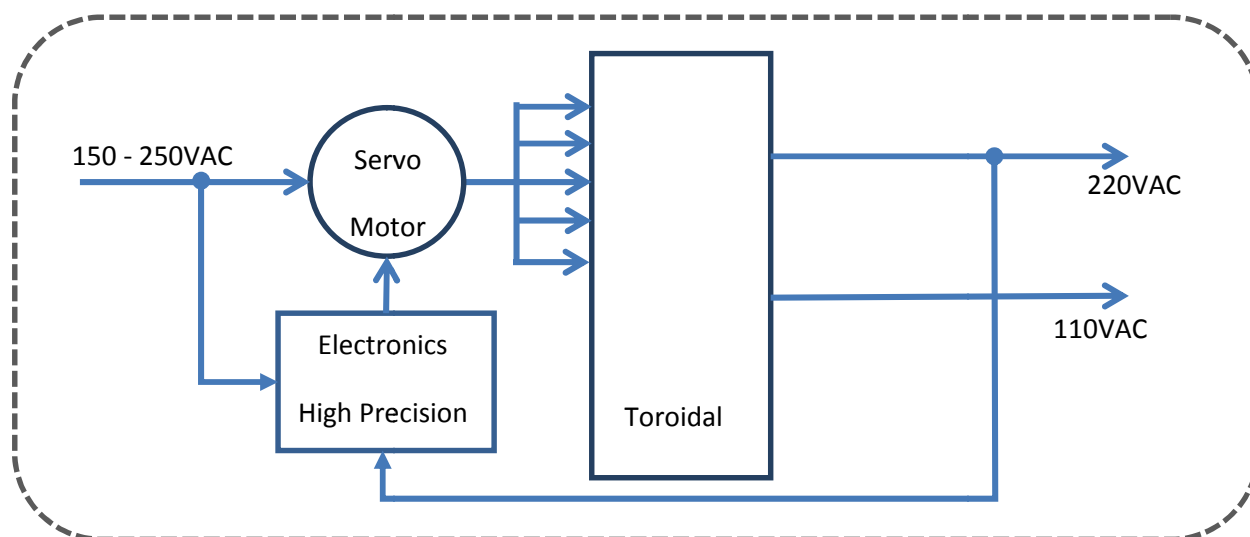
Features

- ✓ LED Front Display Output for Voltage & Current output
- ✓ Pure Sine wave AC Output
- ✓ 2 output voltage : 110VAC and 220VAC
- ✓ Wide range of AC input voltage : 150 - 250V
- ✓ Operating Temperature : -10°C to 40°C
- ✓ High Efficiency : >96% (from half load to full load)
- ✓ Power Factor : 0.8

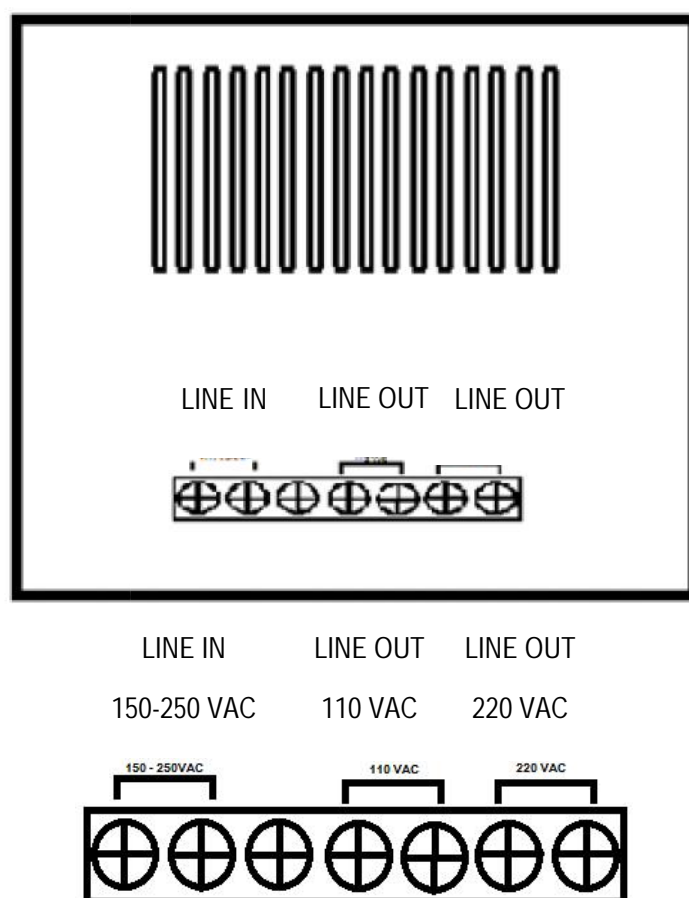
Application

- | | |
|------------------------|-------------------------------------|
| ✓ Computer System | ✓ CNC Machine |
| ✓ Sound System | ✓ Medical Equipment |
| ✓ Communication System | ✓ Laboratory Test Equipment |
| ✓ Security System | ✓ Industrial Process Control System |

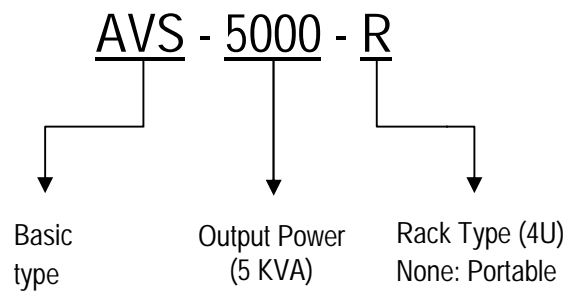
Block Diagram



Connecting Diagram



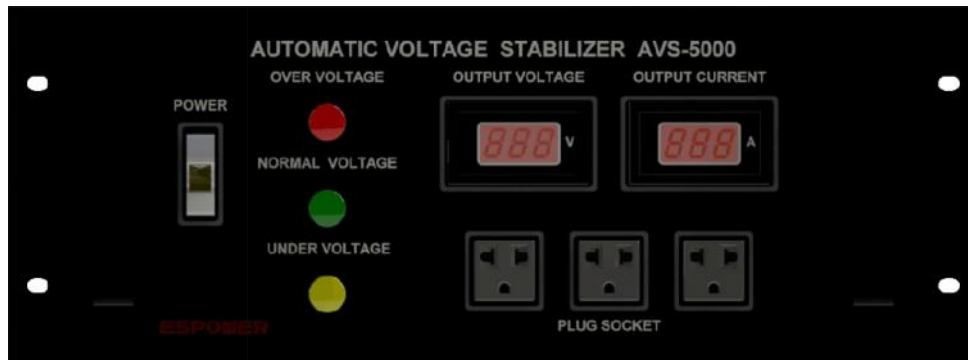
Product Coding



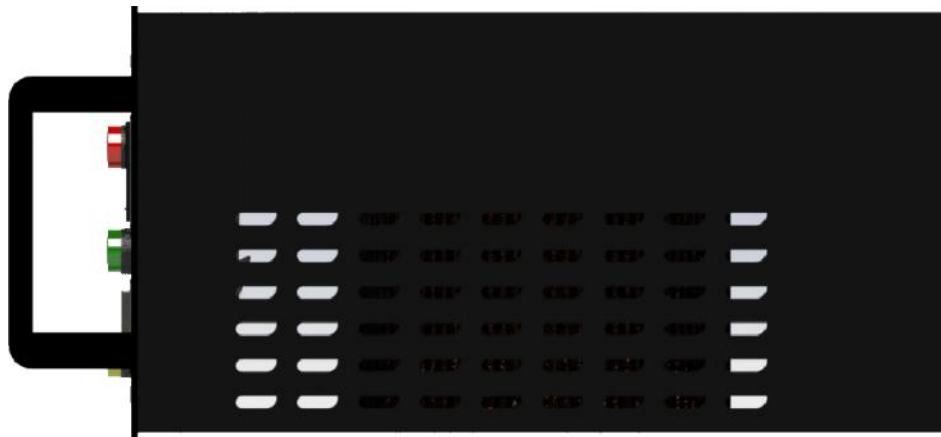
Specification

Model	AVS - 3000	AVS - 5000	AVS - 7500	AVS - 10000
Rating	3KVA	5KVA	7.5KVA	10KVA
Input Voltage	150VAC - 250VAC			
Stabilization Output Voltage	110VAC / 220VAC \pm 3%			
Max. Current	14 A	23 A	34 A	46 A
Frequency	50 / 60Hz.			
Response Time	Less than 1 second			
Operating Temperature	0 - 50°C			
Relative Humidity	<96%			
Waveform Distortion	Non - lack fidelity waveform			
Efficiency	>96%			
Power factor (cosØ)	0.8			
Insulation Resistance	>5M			
Display Panel	Output AC Volt Meter / Output AC Amp. Meter			
Connections	Hard wired Connection 110VAC / 220VAC & Front AC Plug 220VAC			
Dimensions cm (L x W x H)	45 x 24 x 18.5	45 x 24 x 18.5	47 x 26 x 22	47 x 26 x 22
Weight (Portable)	12.5 Kg.	14 Kg.	19.5 Kg.	24.5 Kg.

Dimension



Front View: Rack Type



Side View: Rack Type



Front View: Portable Type



Description

AS series automatic transfer switch, is used suitable in AC power supply system with frequency of 50Hz/60Hz are rated working voltage is AC 690V and up to DC 250V, rated working current is 20 A - 5000 A of two-path. When one power supply fails, ATS switch to standby power supply automatically to ensure reliable power supply.

Features

- ✓ Connection mode: Front panel connection, back panel connection
- ✓ Structure : Compact design with electrical operation and manual operation
- ✓ Characteristics : Quick transfer speed (transfer time is 0.1 - 0.2s)
- ✓ Conversion mode: Power network - power network, power network - generating network
- ✓ Safety mode : Mechanical latch
- ✓ Classification : Two steps
- ✓ Number of poles : 2, 3, 4 poles
- ✓ Frame current : 125, 250, 500
- ✓ Current rating : 80, 100, 125, 160, 200, 225, 250, 300, 350, 400, 500
- ✓ Ambient temp. : -5°C ~ + 50°C
- ✓ Standards : GB 14048.11, IEC60947-6-1

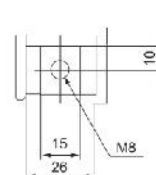
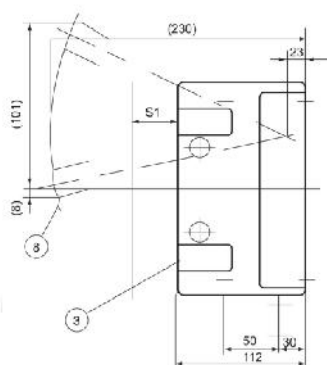
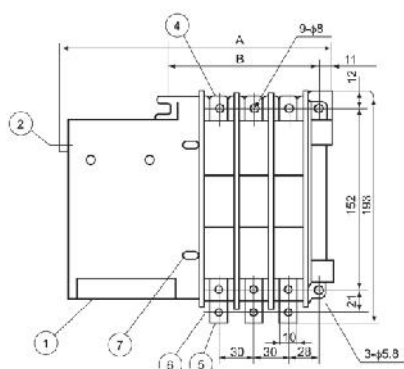
Specification

Type		AS								
Rated voltage		AC 230 / 400 / 690V, DC 48 / 110 / 125V / 250V								
Rated current		80A - 125A			160A - 250A			300A - 500A		
Poles		2P	3P	4P	2P	3P	4P	2P	3P	4P
Weight (kg.)		5	5.5	6	6	8	10	11	14	18
Operating current (A) at control voltage	DC 48V	3	3	3	3	3	3	5	5	7
	DC 110/125V	3	3	4	3	3	5	5	5	7
	AC 220V	1.5	1.5	2	1.5	2	2.5	2.5	2.5	3.5
Capability	Short time withstand current (KA)	5			10			12		
	Short time rated limit current (KA)	12.5			25			30		
Transfer time (ms.): power A side	Put in	55								
	Breaking	20								
Transfer time (ms.): power B side	Put in	80								
	Breaking	20								
Operation		Double Throw								
Connecting way		Front connection								
Auxiliary switch		Switch capability AC100V/5A, AC220V/2.5A, DC100V/0.5A								
Life service		Electrical life 2500 number, mechanism life 10000 number								
Operating recycle time		120 number/Hour								
Accessories		Protection cover and manual operated handle								

Dimension

80A-125A

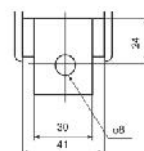
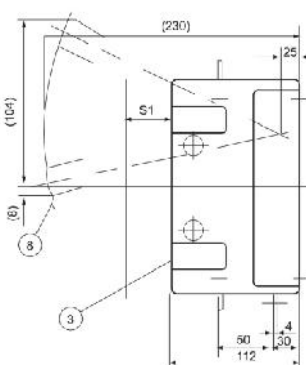
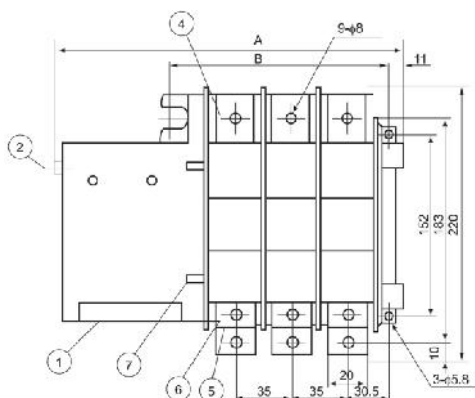
Panel safety distance S1 dimension : 30mm. (400V), 60MM. (690V)



	A	B
2P	209	103
3P	239	133
4P	269	163

160A-250A

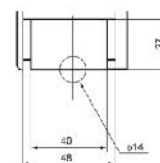
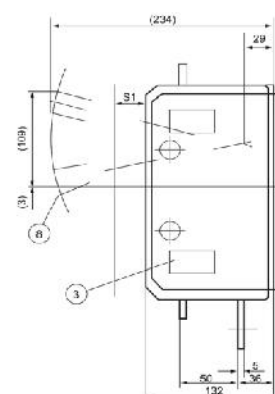
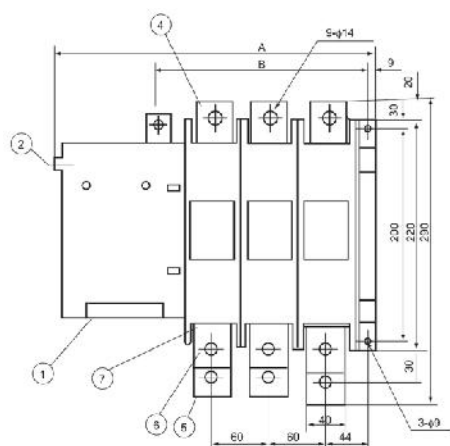
Panel safety distance S1 dimension : 30mm. (400V), 60MM. (690V)



	A	B
2P	219	113
3P	254	148
4P	289	183

300A-500A

Panel safety distance S1 dimension : 30mm. (400V), 60MM. (690V)

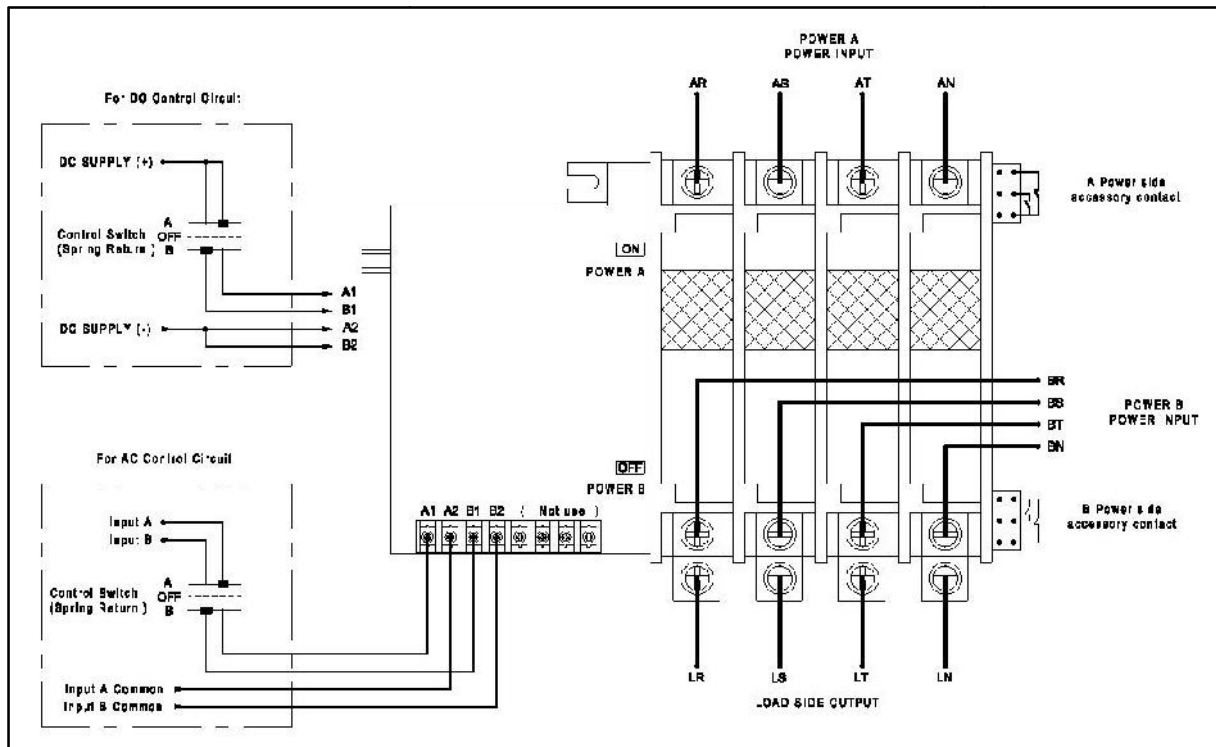
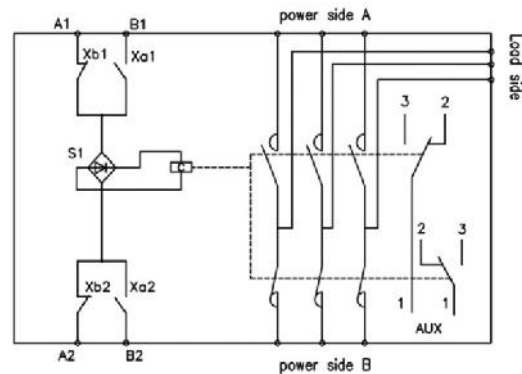


	A	B
2P	229	124
3P	275	160
4P	309	202

- 1) Operating circuit terminal
- 2) Hand - operated handle entrance
- 3) Auxiliary switch
- 4) A Power side main circuit terminal
- 5) Main circuit terminal load side
- 6) B Power side main circuit
- 7) ON/OFF selector
- 8) Hand - operated handle (Movable type)

Control Circuit Diagram

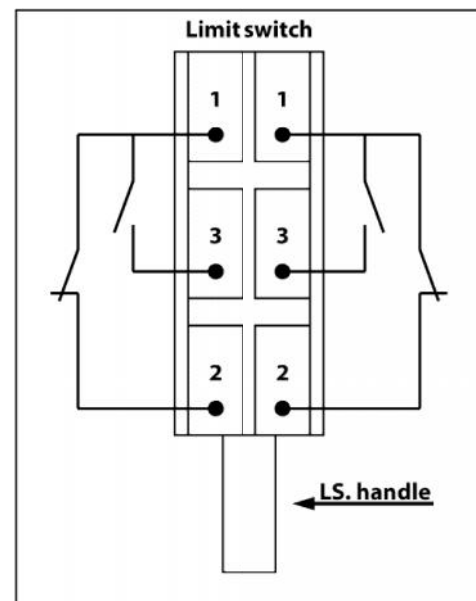
- B1, B2 : Internal control switch
 A1, A2 : Internal control switch
 C : Throw in coil
 S1 : Rectifier
 AUX : Auxiliary switch
 AT1-AT2 : A Power side tripping terminal
 BT1-BT2 : B Power side tripping terminal



Note : A1-A2, B1-B2 Input signal import by AC/DC as per rate control supply of device

: Do not supply continue of both side

: A, B auxiliary contact can be use in connecting the signal of indication or alarm function, and that depends on the customer requirement.



Rack & Tower Case Type



Description

The “**ESPOWER**” power inverter employs high frequency PWM technology with micro processor based design that controls all diagnostics and operations to address the critical AC powering requirements of equipment applications. The front panel is designed for a simple and efficient operation with LCD display that measures and indicates all important parameters.

Intelligent power inverters are fully protection of overload, short circuit, and reverse polarity, over/under input voltage and over temperature. In case of any failures occur that it will send an output alarm contact to show or control the equipment. The output of the inverter is the pure sinusoidal wave type. The waveform is shown as figure 1, is a perfect processor generated output, which is suitable for all types of loads. The “**ESPOWER**” power inverter INV/P series are generally applied for:

- ✓ Backup system for small industrial loads such as a computer system for machine control or computer for CSCS/SCADA/DCS.
- ✓ Power inverter INV/P series are suitable for sensitive powering of telecommunications and data-processing equipments.
- ✓ Office or domestic appliances such as a computer, photocopy machine, television, fluorescent lights, and kitchen appliances.

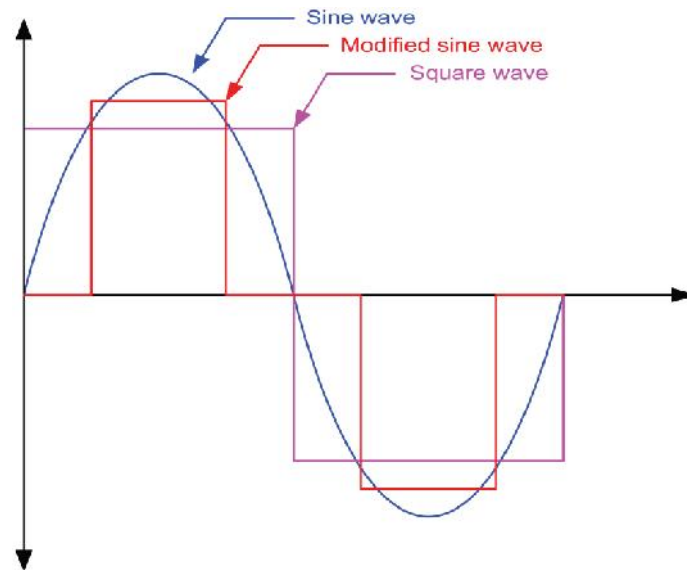
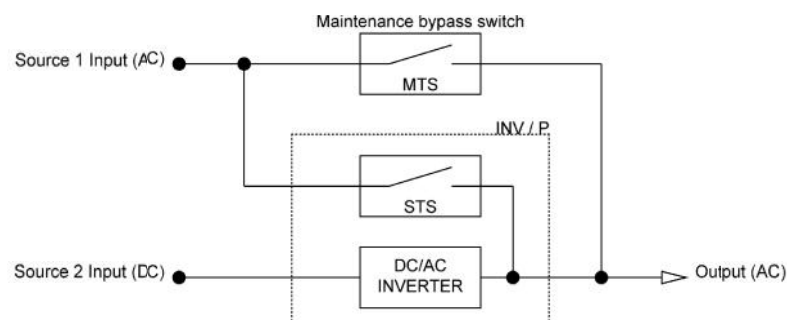


Figure 1

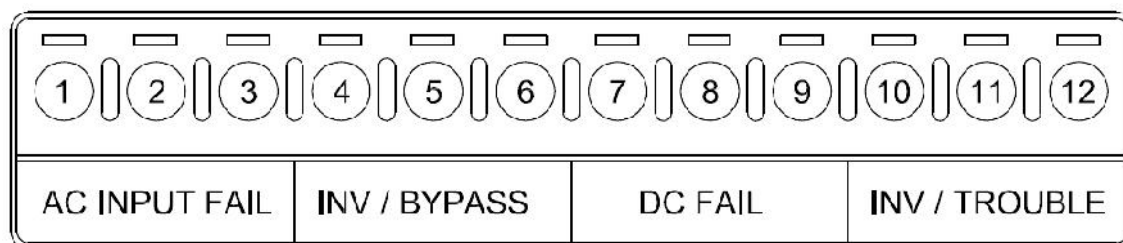
Features

- ✓ LCD Front Screen Display
- ✓ Pure Sine Wave AC Output
- ✓ Wide range of DC input voltage
- ✓ Fan's speed controlled by temperature
- ✓ Low Noise, less than 45 dB (A) at 1 m distance
- ✓ Dry contact alarm for control of operation equipment
- ✓ Compact size (2U), designed to use in 19" equipments racks or Tower case type for ease of mobility or movement.
- ✓ Complete with static bypass switch which transfer time 5 ms
- ✓ AC MCB and DC MCB for on-off function at front panel
- ✓ Ideal for handling sensitive loads for telecommunication and network field application
- ✓ APC (Advance Polarity Check) technology applied to replace old-style fuse and diode, which warn you when reversed wiring.

Block Diagram

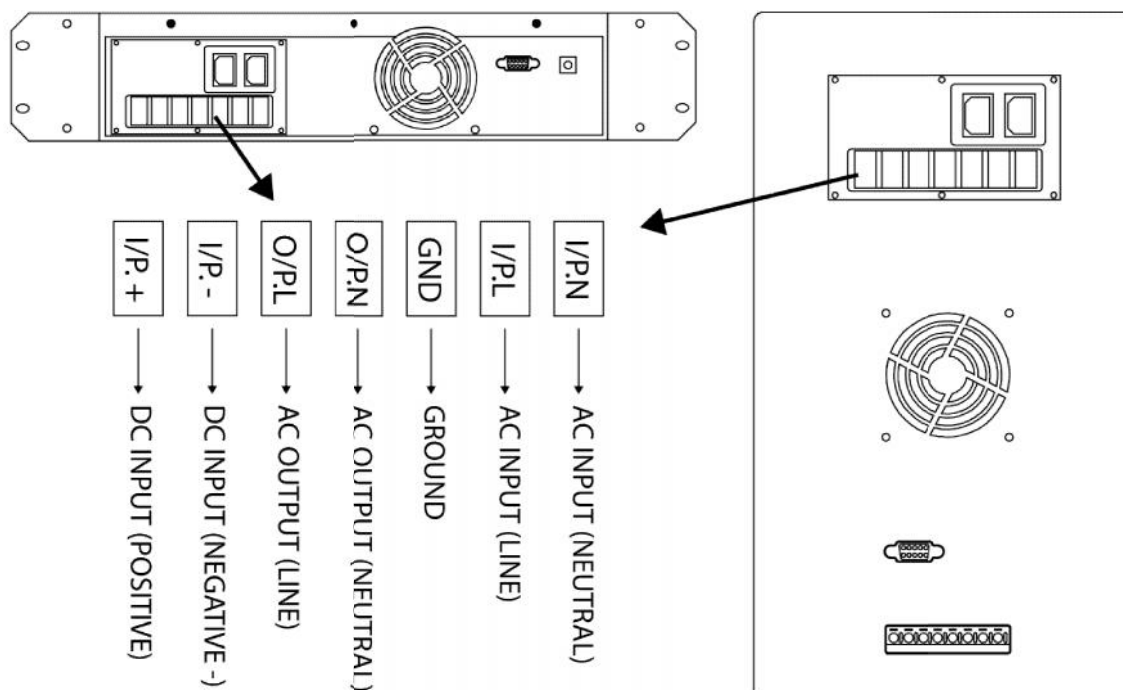


Dry Contact for Alarm Status



NO.	FUNCTION	DRAWING
1	AC INPUT FAIL	
2	INVERTER BYPASS	
3	DC FAIL	
4	INVERTER TROUBLE	

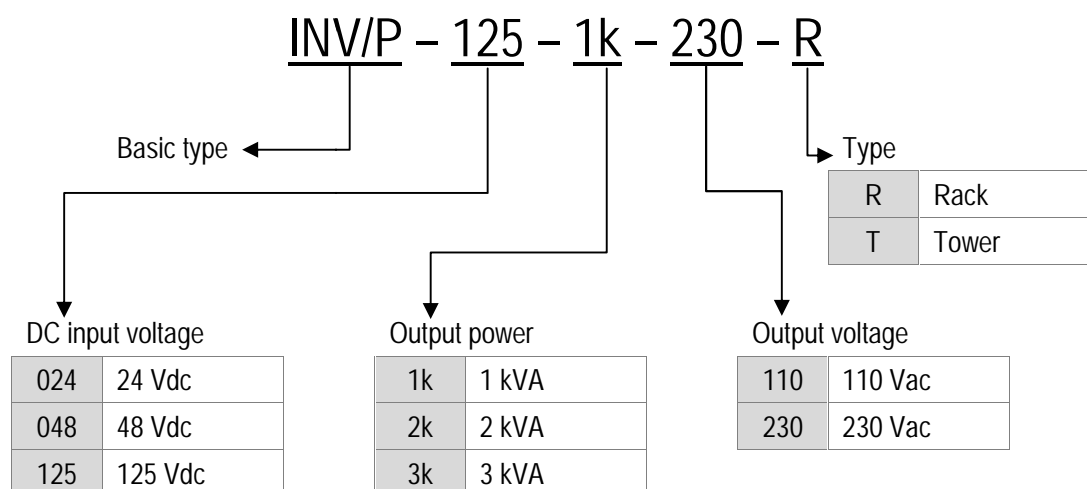
Connecting Diagram



Specification

Model		INV/P		
Rating		1kVA	2kVA	3kVA
DC input	Nominal voltage/ Max. current	24Vdc/38A 48Vdc/19A 125Vdc/7.6A	24Vdc/66A 48Vdc/38A 125Vdc/19A	48Vdc/57A 125Vdc/28A
	Voltage range	24Vdc (20~30Vdc) 48Vdc (40~64Vdc) 125Vdc (105~148Vdc)	24Vdc (20~30Vdc) 48Vdc (40~64Vdc) 125Vdc (105~148Vdc)	48Vdc (40~64Vdc) 125Vdc (105~148Vdc)
	Connections	Hard-wired connection		
	Efficiency	> 85% (Full Load) at 24 or 48 or 125VDC		
	Protection (ON-OFF)	DC circuit breaker		
Utility power (Bypass)	Nominal voltage	110VAC or 230VAC $\pm 20\%$		
	Frequency	50 or 60Hz ± 3 Hz		
	Protection (ON-OFF)	AC circuit breaker		
Inverter output	Output power	800W	1600W	2400W
	Max. surge power	1200W	2400W	3600W
	Voltage	110VAC or 230VAC $\pm 5\%$ *Re-settable $\pm 5\%$ of rating voltage via front panel		
	Voltage regulation	< 2% at Linear load		
	Frequency	50 or 60 Hz $\pm 0.1\%$ Auto sensing by AC power source		
	Waveform	Pure sine wave		
	THD distortion	< 3% at Linear load		
	Crest factor	3		
	Power factor	0.8		
	Cooling system	Forced ventilation		
	Protection (ON-OFF)	AC circuit breaker		
Protection	Short circuit	Inverter shut off, Manual reset when the unit get back to normal		
	Overload	105% ~ 125% for 60 Seconds 126% ~ 150% for 30 Seconds >151% for 1second; Switch to bypass		
	DC polarity reverse	Advanced polarity check (APC)		
	Over temperature	Acoustic warning before shut-off and auto restart and buzzer alarm		
Indicator and Alarm buzzer	LCD display	Input/Output : Voltage/Frequency, DC: Voltage/Current, Loading : Current/Percentage, Temp.: Operation/Over, Polarity reverse		
	Alarm buzzer	AC Input fail, DC Input fail, Inverter/Bypass, Fault/Overload		
Environment	Operating temp.	0°C to 40°C		
	Storage temp.	-10°C to 60°C		
	Relative humidity	0 - 90%, non-condensing		
Physical	Dimension	W480*D465*H88 mm (Rack type)		
		W200*D500*H360 mm (Tower type)		
	Net weight (Rack type)	10kg	11kg	12kg
	(Tower type)	14kg	15kg	16kg

Product Coding



Related product :

- 1) Maintenance bypass switch : (“ESPOWER” MTS series)



- 2) Isolate transformer : “1kVA, 2kVA, 3kVA” (“ESPOWER” IST series)





Description

Under normal conditions, every parameter of rectifier modules and distribution unit are all under control of the monitoring module, operating according to the pre-set parameter or user's commands. If AC mains fault, the system will be powered by the battery. With the battery discharge, the terminal voltage of the battery starts to descend. When the voltage is under $42V \pm 0.5V$, the monitor reports DC under voltage alarm signal and cuts off the load output then the power system stops working. When the external AC mains recovers, the system will resume to the normal work state (All above monitoring data are system default values that users can reset).

Except for battery over-discharge protection, battery or load over-temperature protection is prohibitive under default, users can send command to activate or inactivate according to the demanding. The operating temperature is $55^{\circ}C$ or more but power de-rating will be employed in case of operating temperature is over $55^{\circ}C$.

Regarding to the demand of Telecom Rectifier System, we can customize the requirements by using the following specification ;

- ✓ AC input : 90-290 VAC
- ✓ Rectifier 48VDC output, power can reach up to 1536 W
- ✓ Rectifier 24VDC output, power can reach up to 1280 W
- ✓ Rack mounting DC power supply system output current range : 32A to 640A

Features

- ✓ Adoption of active power factor compensation technology with factor >0.98
- ✓ Wide operating range of AC input voltage 175~280 VAC
- ✓ Operating temperature range $-15^{\circ}C \sim +55^{\circ}C$
- ✓ Zero current/voltage switching tech with high efficiency 92%
- ✓ Battery temperature compensation and LVBD protection
- ✓ Hot-swappable
- ✓ Input over/under voltage protection
- ✓ Output over voltage protection
- ✓ Output over current protection
- ✓ Output short circuit protection
- ✓ Auto current sharing
- ✓ Embedded mounting

Application

- ✓ Small scale program controlled exchanges
- ✓ Transmission equipment
- ✓ Communication system
- ✓ Access control network
- ✓ Security system
- ✓ Factory control system

System Configuration

SYSTEM CONFIGURATION

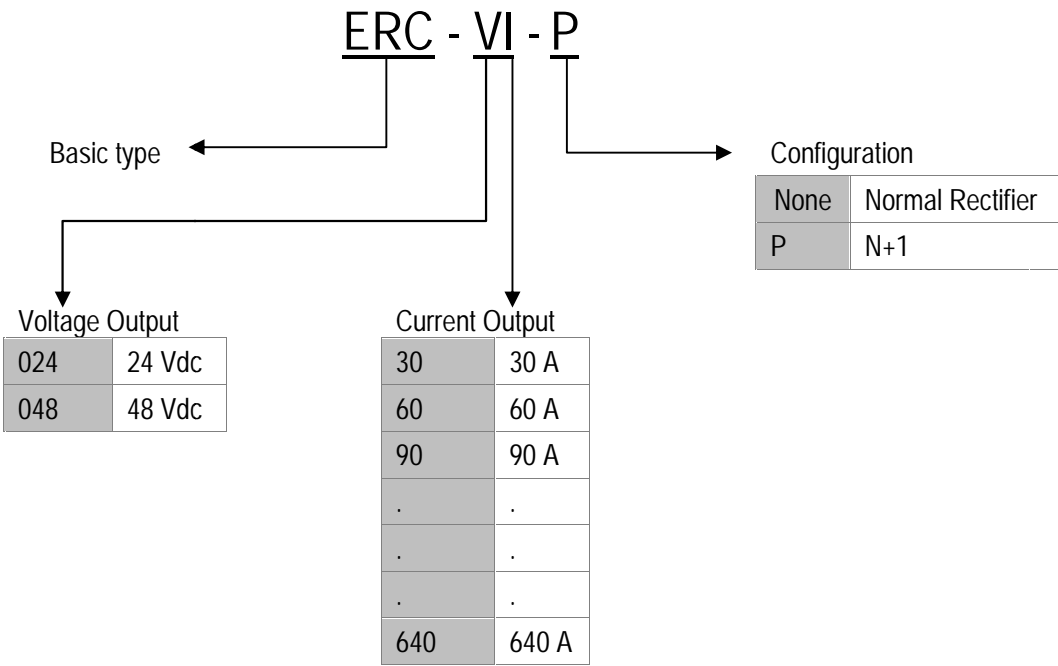
The system consists of distribution unit, rectifier module (up to 3 sets) and monitoring module. The configuration is optional, as following table.

Configuration	Rectifier Module	Monitoring Module	Output Current	DC Distribution
4500 W	GPR4830A x 3	GPM48DI x 1	90 A	DC output : 60A x 1 (Load) DC output : 30A x 1 (Battery)

SPECIFICATION

Input voltage range	Nominal operating voltage : 175 - 280 VAC
Input frequency	45 - 65 Hz
Inrush current	50 A ; Cold start @ 25°C, 285 VAC input tested at full load
Power factor	0.98
Output voltage range	42 - 58 VDC
Ripple (Vp-p)	200 mV
Output efficiency	92% at 230 VAC
Load regulation	± 1%
Output power	4500W at 176 - 285V Input
Output configuration	N + 1 (3000 + 1500W)
Max current output	90 A
Operating temp	- 15°C ~+ 55°C (For temperature between 55°C and 65°C, output De-rating to 80%)
Storage temp	- 40 ~+ 70°C
Relative humidity	5 - 95%
Altitude	0 - 4000m
Cooling method	Forced cooling, front-in & rear-out with speed programmable by temperature.

Product Coding





Features

- ✓ Manual close and trip by discrepancy switch are provided for user convenience and similar with manual operate the circuit breaker in substation.
- ✓ Indication LED semaphore indicator trip or close for circuit breaker status.
- ✓ The circuit breaker simulator has built-in protection against accidental reverse polarity or misapplied source voltage.
- ✓ "Local" or "Remote" can be operated.
- ✓ Operated on 48Vdc, 110Vdc, 125Vdc, 220Vdc system.
- ✓ 4 normally closed contact and 4 normally open contacts are available.
- ✓ "Trip" and "Close" connectors are provided for protective relay input.
- ✓ Designed for rack 19 inches.

Application

- ✓ Prove the trip and close operations while doing routine and commission testing of protective relay operations.
- ✓ Study the correct operation of relay protection configuration.
- ✓ Observation of relay operation in real time by focusing the suspicious tripping.
- ✓ Demonstration in learning school process with overall explanation of protection relaying.

Specification

MM01

Normal voltage input	48, 110, 125, 220Vdc
Operating time delay	< 10ms
Installation	Rack 19 inches.
Dimension	W43 x D43 x H13 cm.; front plate W58 x H13 cm.
Operating temperature range	+ 5°C to + 55°C ; Humidity < 90%
Storage temperature range	- 25°C to + 85°C
Manual operation	By Discrepancy switch
Operate indication	Red, Green for Aux. contact status
	LED semaphore indicator for circuit breaker status
	LED lamp for discrepancy switch

MM02 (Breaker/DS = 5 set, Fault switch = 8 EA)

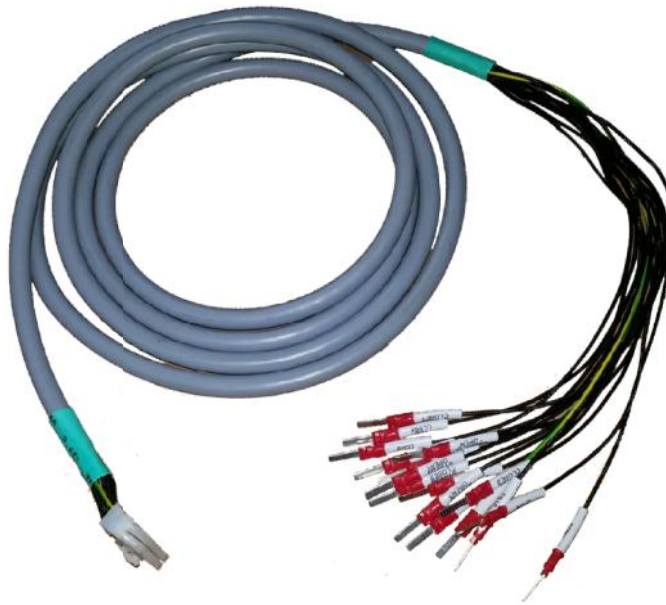
Normal voltage input	48, 110, 125, 220Vdc
Operating time delay	< 10ms
Installation	Compact Box
Dimension	W30 x D20 x H10 cm
Operating temperature range	+ 5°C to + 55°C ; Humidity < 90%
Storage temperature range	- 25°C to + 85°C
Manual operation	By push button switch of each breaker / DS
Operate indication	Red, Green of each Breaker / DS

MM03 (Breaker/DS = 6 set, Fault switch = 12 EA)

Normal voltage input	48, 110, 125, 220Vdc
Operating time delay	< 10ms
Installation	Compact Box
Dimension	W30 x D20 x H10 cm
Operating temperature range	+ 5°C to + 55°C ; Humidity < 90%
Storage temperature range	- 25°C to + 85°C
Manual operation	By push button switch of each breaker / DS
Operate indication	Red, Green of each Breaker / DS

Remark : Complete with wire connection set.

Wire Connection



Wire MM03 connection (Length 3 m.; 7 set in 1 Box)



Description

Power supply unit is working by switching regulator circuit. It makes the Power supply unit capable to work in wide range input voltage from 85 V to 265 V while output voltage is still regulated. Suitable for Capacitive & Inductive load, high efficiency, compact size and easy install.

Features

Features	Benefits
Structure	Compact design
Efficiency	Up to 92%
Wide Range Input	85 - 264 VAC / 120 - 370 VDC
LED Indicator	Green - DC OK, Red - Peak Power Mode (Overload)
Safety mode	Thermal Protection, Over current protection, Over - voltage protection
Ambient temp	- 10 °C to + 70 °C (60 °C to 70 °C derate to 75% load)
Standards	IEC/EN/UL60950 - 1, CE, UL508 Listed

Specification

Models	ESP-60-24	ESP-120-24	ESP-240-24
AC/DC Input voltage Range	85 - 265 VAC or 100 - 350 VDC		
Input Frequency	47 - 63Hz		
Inrush cold current	20 A		
Power Factor (115/230)	0.98/0.95	0.98/0.95	0.98/0.95
Input Current	1.2/0.6 A	2.4/1.2 A	4.7/2.5 A
Output voltage	24 V		
Output Current	2.5 A	5 A	10 A
Peak output current	3.75 A	7.5 A	15 A
Peak output power	90 W	180 W	360 W
Line regulation	<96 mV		
Load regulation	<240 mV		
Ripple and noise	<240 mV		
Over current protection	105 - 150% peak output current		
Over voltage protection	30 - 35.5V		
Hold up time (230VAC)	20 ms		
Average efficiency (230VAC)	88.6%	92.4%	92%
Standby input power (230VAC)	<0.5 W	<0.5 W	<0.75 W
DC OK relay	Relay contact 30V/1A (closed if Vout> 80% of rated output voltage)		
Operating temperature	- 10 °C to + 70 °C (60 °C to 70 °C derate to 75% load)		
Parallel operation	Possible		
Series operation	Possible		
LED indicators	DC OK signal-green (Vout>80% rated output voltage) Peak power mode-red		
Storage temperature	25 °C to + 85 °C		
Operating humidity	5 - 95% RH (non condensing)		
Operating altitude	3,000 m		
Cooling	Convection		
Withstand voltage	I/P to FG : 1.5kVAC (20mA), I/P to O/P 3kVAC (20mA), O/P to FG : 500VAC (100mA) for 1 min.		
Isolation resistance	I/P to FG, I/P to O/P and O/P to FG :>100M (500VDC) at 25°C & 70% RH		
Vibration	Non-operation, 10-55 Hz (sweep for 1 min.) : 19.6 m/s ² constant, X, Y, Z axis 1 hour each		
Shock	<196m/s ²		
Safety agency approvals	IEC/EN/UL60950-1, CE, UL508 listed, (ATEX/IECEX/Marine-GL approved models available)		
Emissions	EN55022 Class B, CISPR22-B		
Immunity	EN61000 - 4, - 2, - 3, - 4, -5, - 6, - 8, -11		
Weight	200 G	490 G	1,040 G
Size (W x H x D)	53 x 93 x 58 mm	40 x 130 x 125 mm	125 x 130 x 112 mm
Case material	Metal		
Warranty	2 Years		

