

AC-DC Converter

**POWER
SOLVE**

PAK650/PAK1000 Series 650W - 1000W Active PFC Single Output

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Features

- Universal AC Input with active PFC
- Programmable Output Voltage (30%-105%)
- Programmable Output Current (40%-100%)
- High Efficiency up to 90%
- +5V/0.5A Auxiliary Output
- Intelligent LED Indicators
- 1U profile, High Power Density
- Forced current sharing for parallel operation
- Power OK signal (Power good, logic low)
- Remote ON/OFF, Remote Sense function
- OVP, OLP, OTP, SCP, Fan Failure Protections



PAK650: 249(L) x 127(W) x 41(H) mm
PAK1000: 283(L) x 127(W) x 41(H) mm

Electrical Specification

Input Voltage	90-264Vac full range, 47-63Hz / 127-370VDC. Below 100Vac, derate load linearly to 90% at 90Vac.
Power Factor	>0.98 @ 230Vac / >0.99 @115Vac
AC Input Current (typ.)	7.5A @ 115Vac / 3.5A @ 230Vac (PAK650) 12A @ 115Vac / 5A @ 230Vac (PAK1000)
Inrush Current	27A @ 115Vac / 54A @ 230Vac
Leakage Current	<1mA @ 230Vac
Output Voltage	See Table
Output Current	See Table
Voltage Tolerance	±1%
Voltage Adjust Range	±5.0% typical adjustment by potentiometer
Overload Protection	>105% of rated output power. Total Power Limiting, output latches off, recycle AC input to recover
Overvoltage Protection	See Table for values. Output latches off, recycle AC input to recover
Over Temperature Protection	Shuts down output, recovers automatically when temperature goes down
Auxiliary Power	+5V @ 0.5A (±3%)
Remote ON/OFF Control	External switch or NPN transistor to turn on/off
Power OK Signal	Open drain signal low when PSU turns on. Max. sink current 20mA, max drain voltage 40V
Output Voltage Programming	Adjustment of output voltage between 30-105% of rated output (see graph)
Output Current Programming	Adjustment of output current between 40-100% of rated output (see graph)
Operating Temperature Range	-25°C to +60°C. Above 50°C, derate linearly to 60% load at 60°C
Operating Humidity	20-90% RH non-condensing
Storage Temperature Range	-40°C to +85°C
Storage Humidity	10-95% RH non-condensing
Temperature Coefficient	±0.02%/°C (0-50°C)
Vibration	Compliance to IEC 68-2-6, IEC 68-2-64
Safety Standards	UL60950-1 2nd edition, CSA C22.2 No. 60950-1-07 2nd edition, TUV EN60950-1: 2006 approved
Withstand Voltage	I/P-O/P: 3kVac, I/P-FG: 1.5kVac, O/P-FG: 0.5kVac
Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG: 100MΩ / 500VDC
EMI Conduction & Radiation	EN55022: 1998+A1 : 2000+A2 : 2003 Class B
Harmonic Current	EN61000-3-2: 2000+A2 : 2005 Class A, EN61000-3-3 : 1995+A1 : 2001
EMS Immunity	EN61000-4-2, 3, 4, 5, 6, 8, 11, EN50204 : 1998+A1 : 2001+A2 : 2003
Cooling	Controlled by power rating & temperature (internal fan)
Dimensions	249(L) x 127(W) x 41(H) mm (PAK650) 283(L) x 127(W) x 41(H) mm (PAK1000)
Weight	1.75Kg (PAK650) 1.90Kg (PAK1000)

Notes:

1. All parameters NOT specifically mentioned are measured at 230Vac input, rated load and 25°C ambient temperature
2. Ripple and noise are measured at 20MHz bandwidth by using a 12" twisted pair wire terminated with a 0.1µF ceramic & 47µF electrolytic capacitors across the output
3. Derating is required at low input voltages. Below 100Vac, derate linearly to 90% load at 90Vac
4. When parallel connected, only one unit may operate if the total output load is less than 5% of rated load
5. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC Directives

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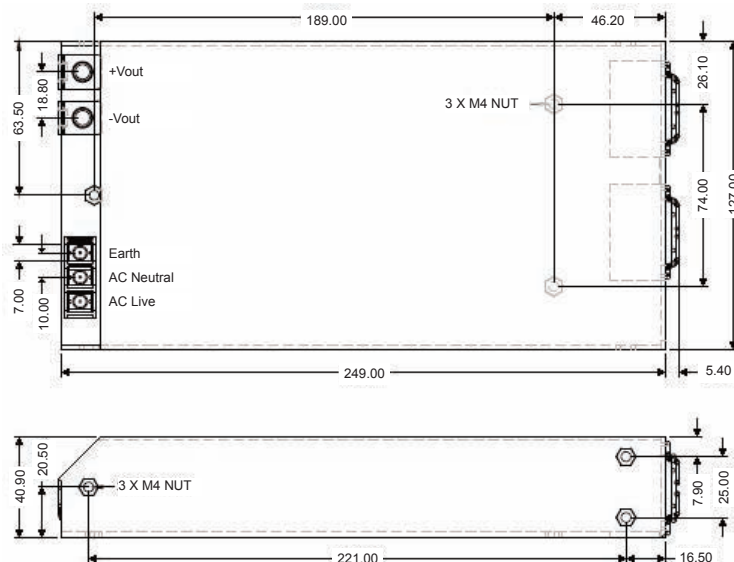
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Output Voltage and Current Ratings

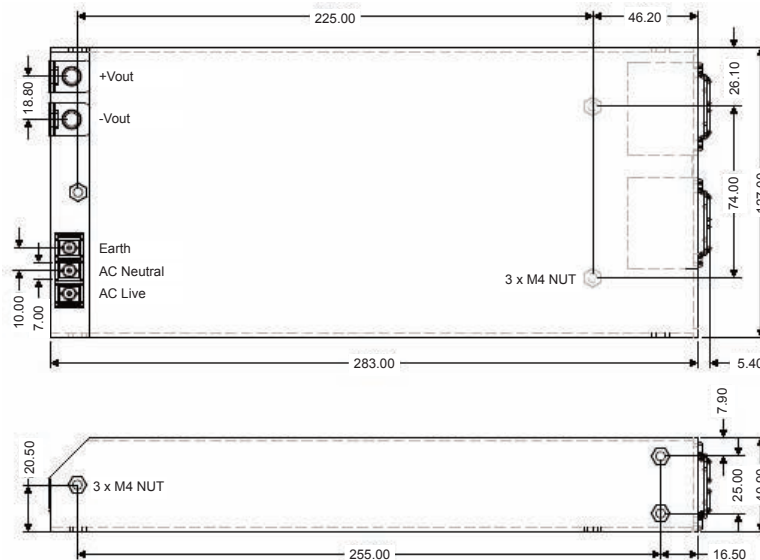
MODEL	OUTPUT VOLTAGE	MAX OUTPUT CURRENT	OVERVOLTAGE PROTECTION	RIPPLE & NOISE	LINE REG.	LOAD REG.	POWER Max.	EFF.
PAK650-05	5V	100A	5.75-6.25V	150mV p-p	±0.5%	±0.5%	500W	83%
PAK650-12	12V	50A	13.8-15.0V	150mV p-p	±0.5%	±0.5%	600W	88%
PAK650-15	15V	40A	17.0-19.0V	150mV p-p	±0.5%	±0.5%	600W	88%
PAK650-24	24V	27A	27.6-30.0V	150mV p-p	±0.5%	±0.5%	648W	90%
PAK650-27	27V	24A	31.0-33.75V	150mV p-p	±0.5%	±0.5%	648W	90%
PAK650-48	48V	13.6A	55.2-60.0V	150mV p-p	±0.5%	±0.5%	652W	91%
PAK1000-12	12V	62A	13.8-15.0V	150mV p-p	±0.5%	±0.5%	744W	87%
PAK1000-15	15V	50A	17.0-19.0V	150mV p-p	±0.5%	±0.5%	750W	88%
PAK1000-24	24V	40A	27.6-30.0V	150mV p-p	±0.5%	±0.5%	960W	89%
PAK1000-27	27V	37A	31.0-33.75V	150mV p-p	±0.5%	±0.5%	999W	89%
PAK1000-48	48V	21A	55.2-60.0V	150mV p-p	±0.5%	±0.5%	1008W	90%

Mechanical Details

PAK650: 249(L) x 127(W) x 41(H) mm



PAK1000: 283(L) x 127(W) x 41(H) mm



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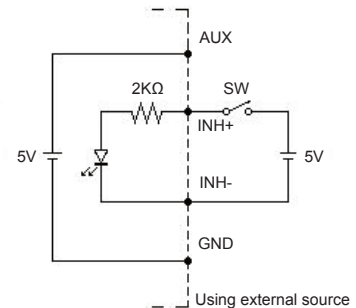
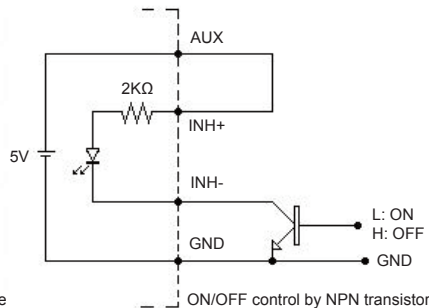
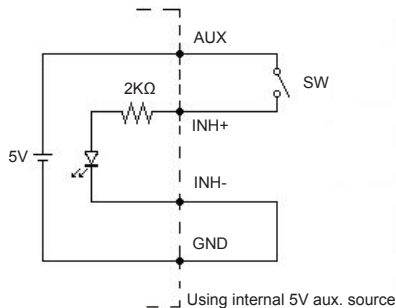
Function Description of CN9, Control Connector

Pin No.	Function	Description	Mating Housing	Terminal
1	VS+	Remote Voltage Sense (+)	JST PHDR-16VS	JST SPHD-002T-P05
2	VO+	Local Output Voltage Sense (+)		
3	VS-	Remote Voltage Sense (-)		
4	VO-	Local Output Voltage Sense (-)		
5, 6	Aux	+5V / 0.5A Auxiliary Power		
7	INH+	Inhibit ON/OFF (+)		
8, 10, 12, 14	GND	Ground		
9	INH-	Inhibit ON/OFF (-)		
11	POK	Power OK		
13	VCI	V Program		
15	ACI	I Program		
16	PAR	Parallel Operation Current Share		

LED Status

LED Colour	LED Signal	Status
Green LED	Solid	Power OK
	Slow Blink	Power Standby
	Fast Blink	Over Voltage Protection (OVP)
Red LED	Solid	Over Load Protection (OLP)
	Slow Blink	Output Short Circuit Protection (SCP)
	Intermittent Blink	Under Voltage Protection (UVP)
	Interlace Blink	Over Temperature Protection (OTP)
	Intermittent Blink	Fan Failure
	Interlace Blink	Power Failure

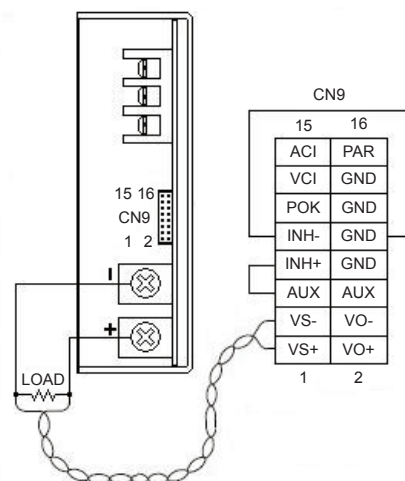
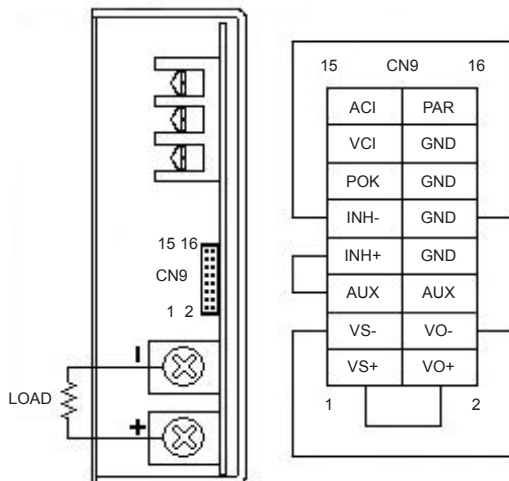
Remote ON/OFF



Functions

Local Sense

Remote Sense

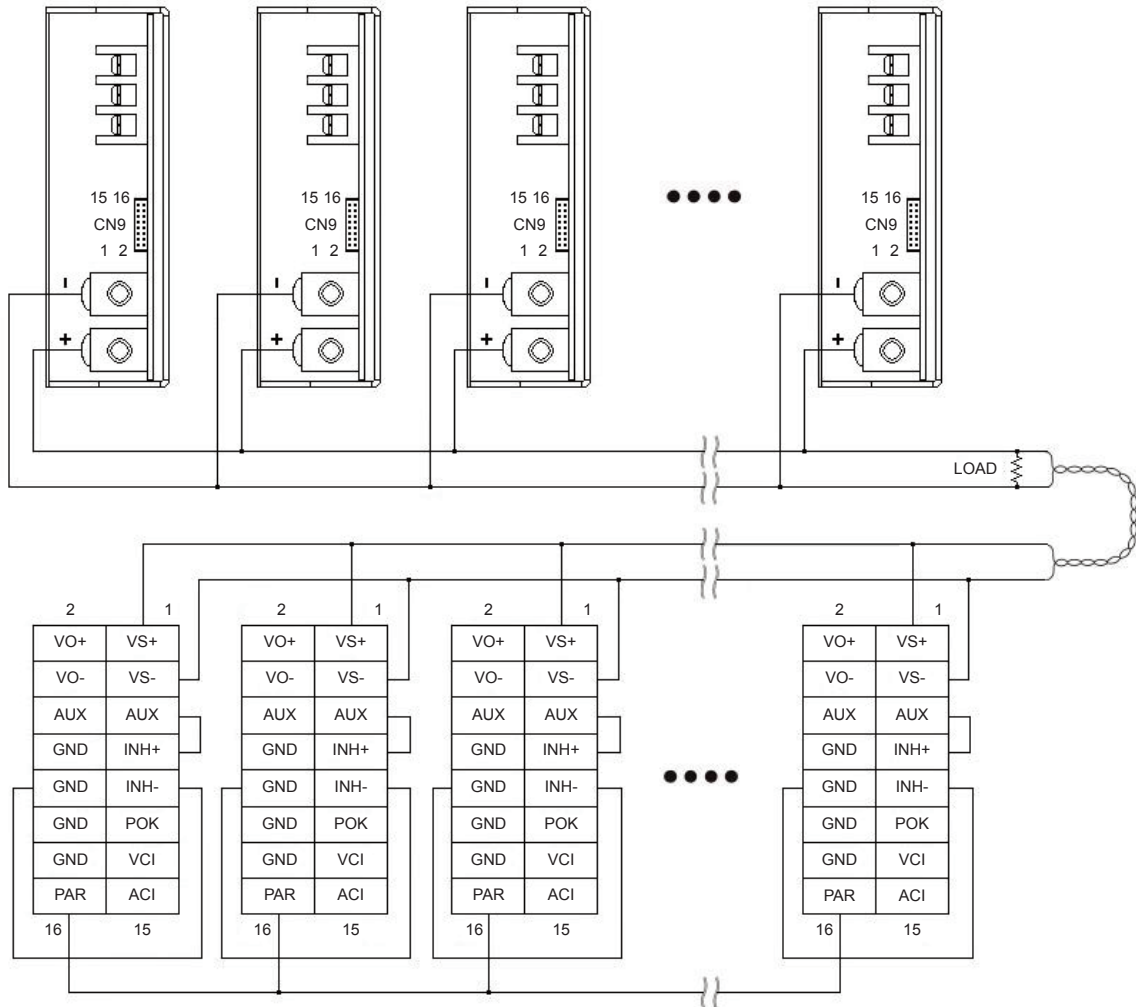


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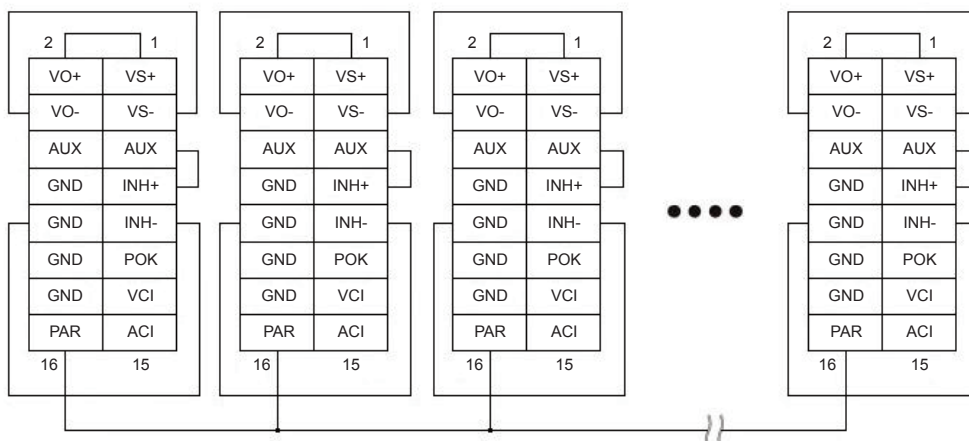


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Current Sharing with Remote Sensing



Current Sharing with Local Sensing

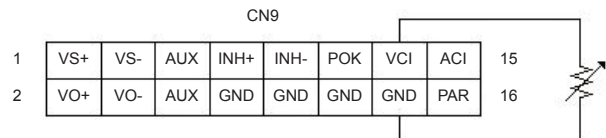
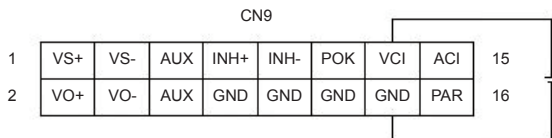
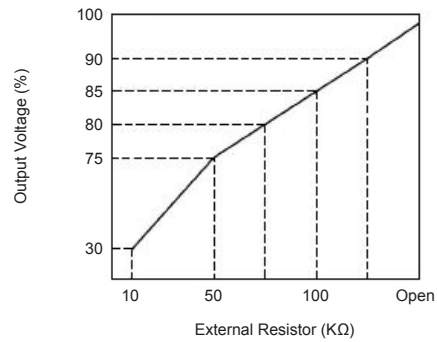
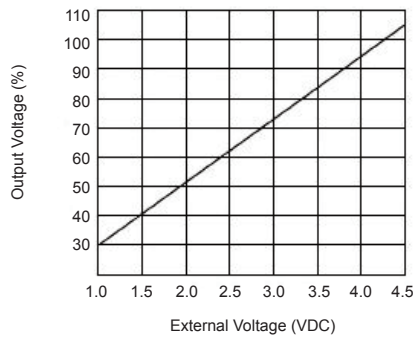


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Output Voltage Programming



Output Current Programming

