

AC-DC Converter

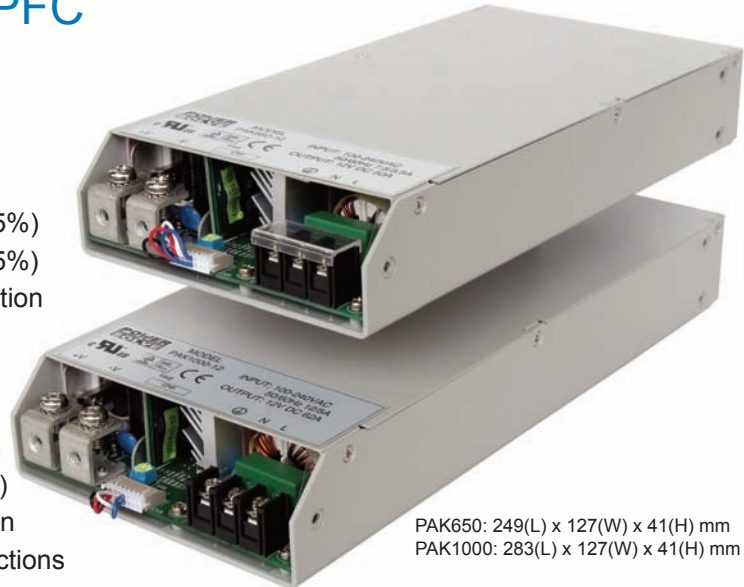
**POWER
SOLVE**

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%-105%)
- Forced current sharing for parallel operation
- High Efficiency up to 91%
- +5V/0.5A Auxiliary Output
- Intelligent LED Indicators
- 1U profile, High Power Density
- 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 at 230VAC / >0.99 at 115VAC at full load
AC Input Current (typ.)	7.5A at 115VAC / 3.5A at 230VAC (PAK650) 12A at 115VAC / 5A at 230VAC (PAK1000)
Inrush Current	27A at 115VAC / 54A at 230VAC
Leakage Current	<1mA at 230VAC
Output Voltage	See Table
Output Current	See Table
Voltage Tolerance	±1%
Voltage Adjust Range	±5.0% typical adjustment by potentiometer
Overload Protection	105-125% of rated output power. Total Power Limiting, output latches off, recycle AC input to recover
Overvoltage Protection	Variable OVP, 125% ±10% of Vout. 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 40-105% 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 IEC68-2-6, IEC68-2-64
Safety Standards	UL60950-1 2nd edition, TUV EN60950-1: 2006+A11 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: 2006 Class B
Harmonic Current	EN61000-3-2: 2006 Class A, EN61000-3-3 : 1995+A1 : 2001+A2: 2005
EMS Immunity	EN55024 : 1998+A1: 2001+A2 : 2003 light industry level, criteria A
MTBF	PAK650: 166.2K Hrs, PAK1000: 142.8K Hrs, MIL-HDBK-217F
Cooling	Internal fan controlled by power rating & temperature, allow 50mm clearance at each end for airflow
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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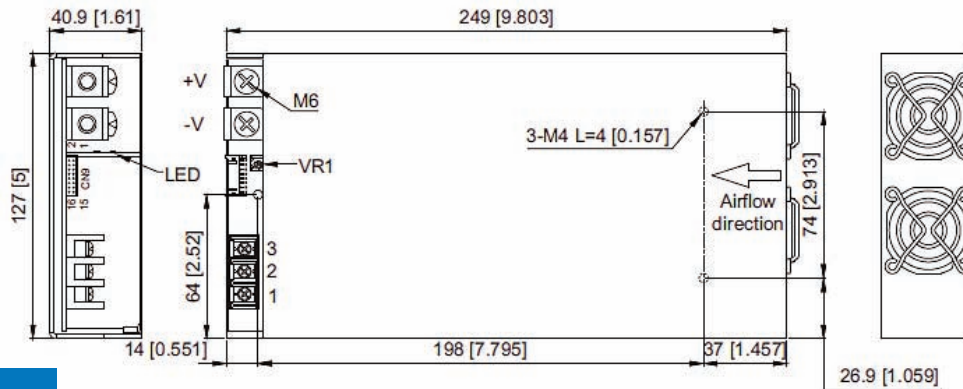
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Output Voltage and Current Ratings

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

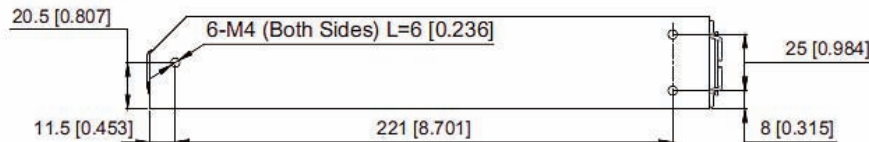
Mechanical & Connection Details

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

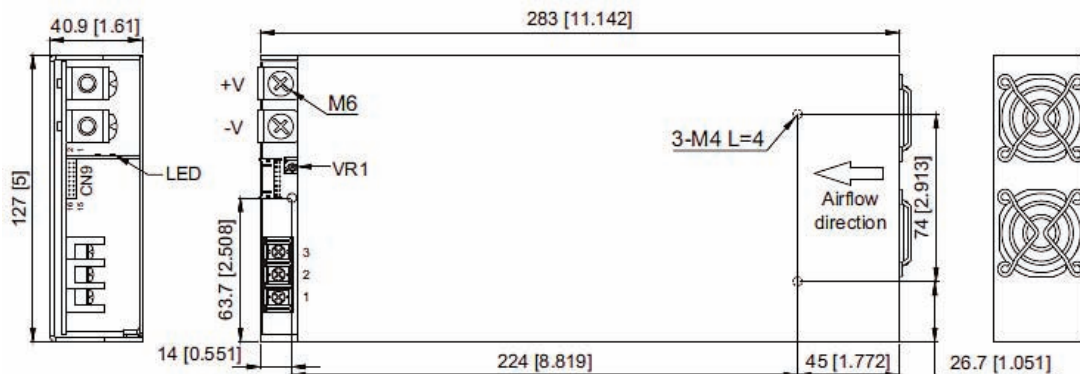


Connections

Pin	Function
1	Live
2	Neutral
3	Earth

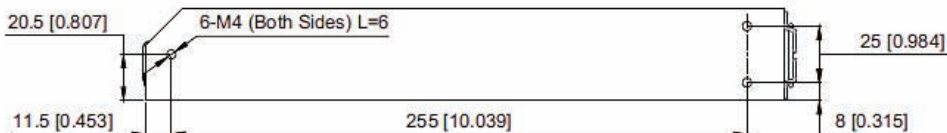


PAK1000: 283(L) x 127(W) x 41(H) mm



Connections

Pin	Function
1	Live
2	Neutral
3	Earth



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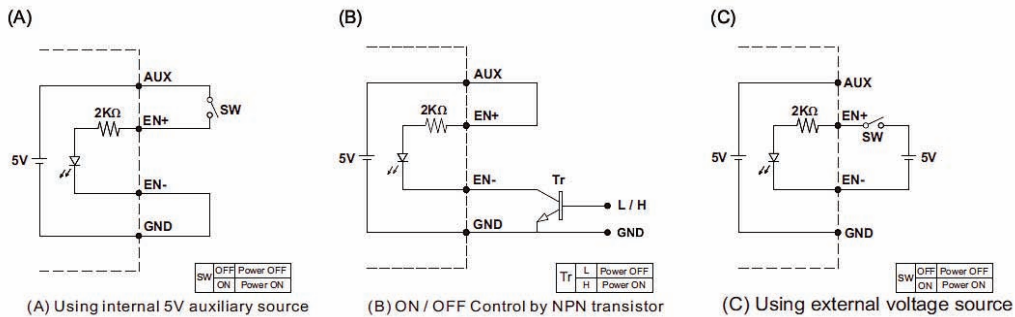
Function Description of CN9, Control Connector

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

LED Status

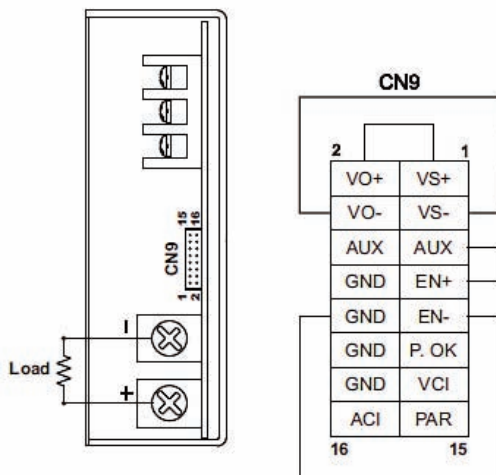
LED Colour	LED Signal	Status
Green LED	Solid	Power OK
	Slow Blink	Power Standby
	Fast Blink	Over Voltage Protection (OVP)
Red LED	Solid	Over Load Protection (OLP)
	Slow Blink	Output Short Circuit Protection (SCP)
	Intermittent Blink	Under Voltage Protection (UVP)
	Interlace Blink	Over Temperature Protection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

Remote ON/OFF

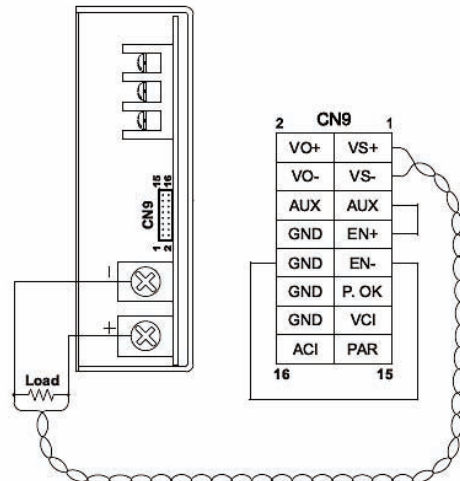


Functions

Local Sense



Remote Sense

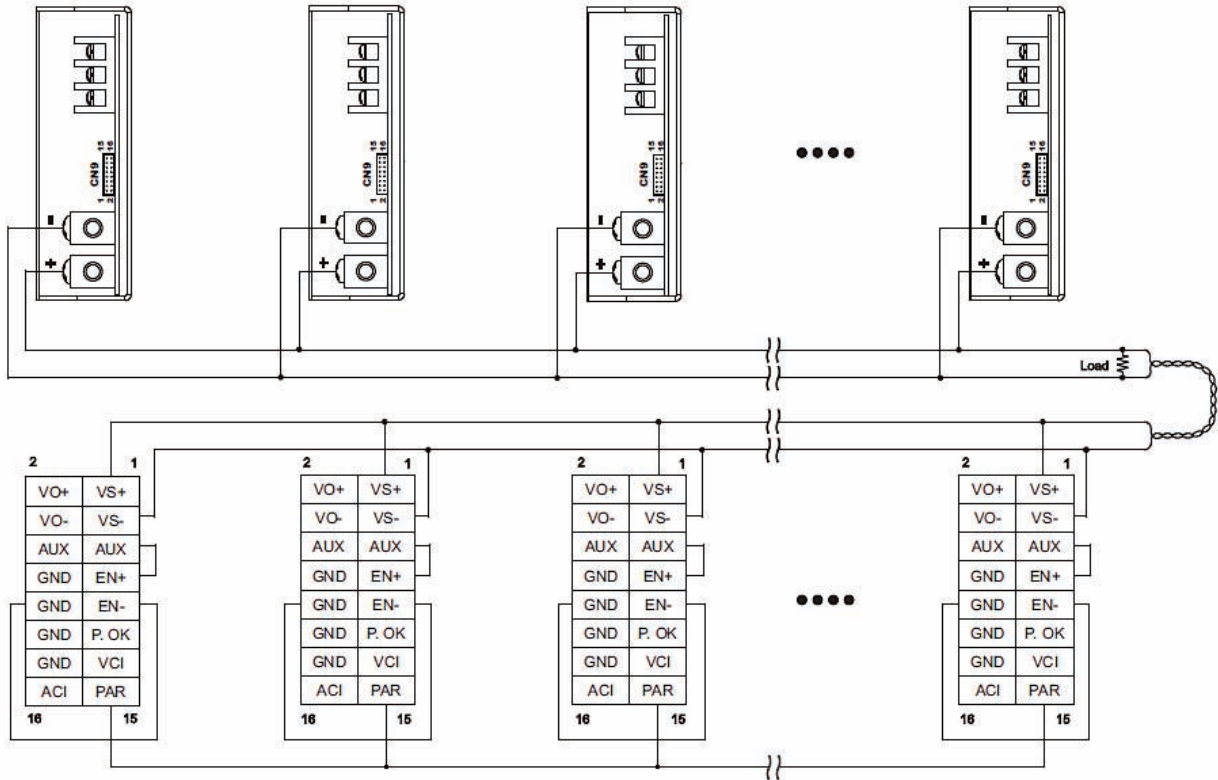


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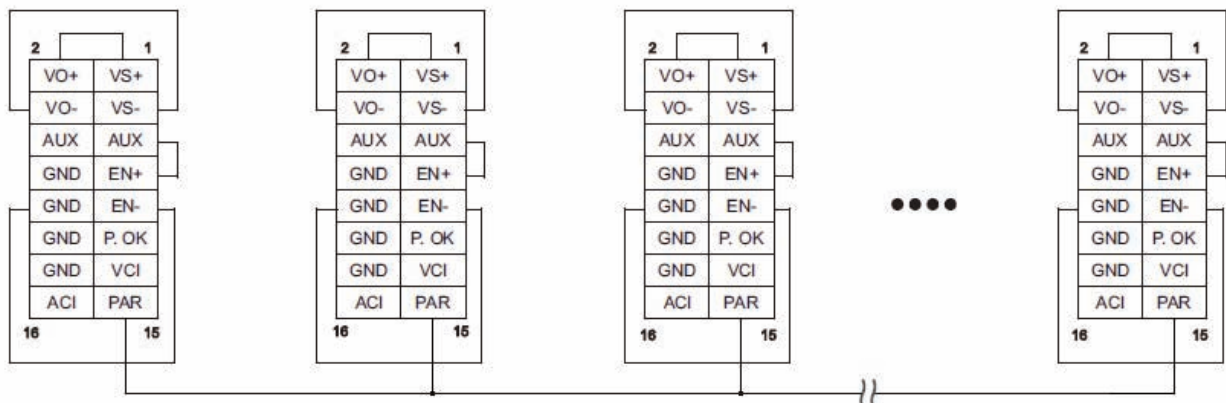


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Current Sharing with Remote Sensing



Current Sharing with Local Sensing

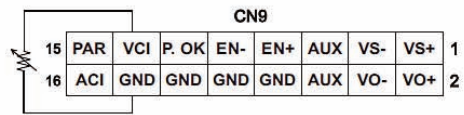
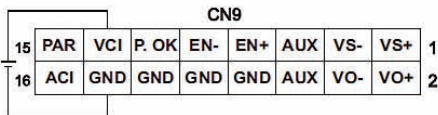
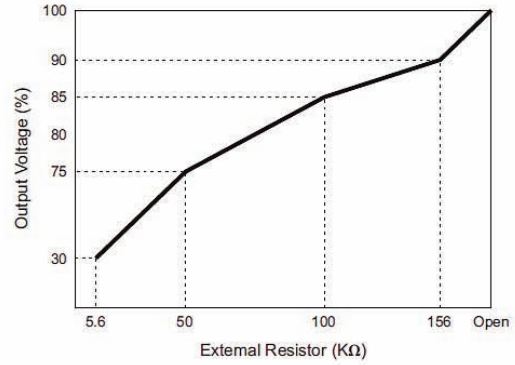
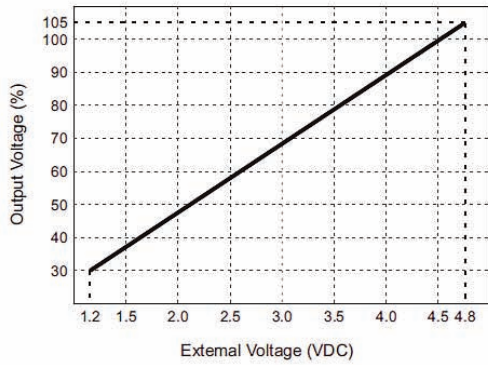


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Output Voltage Programming



Output Current Programming

