

3000W FAN COOLED

The HDS3000 series offers users both output voltage and output current programming (0–105%) via resistance, voltage or I^2C bus in a very high efficiency, high power density 3kW chassis mount package. Measuring just 5.0" x 14.41", the HDS3000 also features active current sharing, remote on/off, remote sense and a power OK signal. The standby output is available whenever the mains supply is present and can be user selected as either 5V at 0.5A or 9V at 0.3A.

AC-DC POWER SUPPLIES



Features

- High efficiency up to 93%
- High power density
- Programmable output voltage (0-105%)
- Programmable output current (0-105%)
- Parallel operation
- Fully featured signals and controls
- 3 year warranty

Applications







Industrial Electronics & Robotics

Lasers

LED Heating



Single Phase Programmable

3D Printing

Dimensions

5.0" x 5.0" x 14.41" (366.0 x 127.0 x127.0mm)

Models & Ratings

Model Number	Output Voltage V1	Output	Current	F45 -: (1)	Disculs C Naiss	0.4.4.0
		Min	Max	Efficiency ⁽¹⁾	Ripple & Noise	Output Power
HDS3000PS12	12.0VDC	0.0A	250.0A	89%	150mV	3000W
HDS3000PS15	15.0VDC	0.0A	200.0A	90%	150mV	3000W
HDS3000PS24	24.0VDC	0.0A	125.0A	91%	200mV	3000W
HDS3000PS30	30.0VDC	0.0A	100.0A	91%	200mV	3000W
HDS3000PS36	36.0VDC	0.0A	83.5A	92%	200mV	3000W
HDS3000PS48	48.0VDC	0.0A	62.5A	92%	200mV	3000W
HDS3000PS60	60.0VDC	0.0A	50.0A	93%	300mV	3000W

Notes:

1. Measured with 230VAC input and full load.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions	
Input Voltage	90		264	VAC	See derating curve	
Input Frequency	47		63	Hz		
Power Factor		0.99/0.98			115/230VAC Full load	
Input Current			36/18	А	115/230VAC	
Inrush Current			60/90	А	115/230VAC	
Earth Leakage Current			2.5	mA	264VAC/60Hz	
Input Protection	2 x F20A/250 V internal fuse					

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions		
Output Voltage	12		60	VDC	See Models & Ratings table		
Output Trim		±5.0		%	By potentionmeter		
Output Voltage Program	0		105	%	Of rated output		
Output Current Program	0		105	%	Of rated output		
Voltage Tolerance(1)			±1	%			
Current Tolerance(1)			±2		Of rated output ⁽¹⁾		
Minimum Load	0		±3	%	Of rated output ⁽¹⁾		
Start Up Delay			2	s			
Start Up Rise Time			150	ms	At full load		
Hold Up Time	8			ms			
Line Regulation			±1	%			
			±1	%	V1, 0-100% load		
Load Regulation			±3	%	5V standby, 0-100% load		
Transient Response			1	%	For a 25% step load change		
Ripple & Noise	150		300	mV pk-pk	1.25% for 12V model. Measured with 20MHz bandwidth and using 12" twisted pair wire terminated with 0.1µF ceramic capacitor and 47µF electrolytic.		
Overvoltage Protection	Tracks output	t voltage. See	application note	s, recycle AC to	o reset		
Overtemperature Protection	Primary and	secondary hea	atsinks monitored	d. Output shuts	down, auto recovers		
Overload Protection		105		%	Rated power, constant current		
Short Circuit Protection	Auto recover	У					
Temperature Coefficient		±0.02		%/°C	0-50°C		
Remote Sense	Compensate	s for 0.5V max	voltage drop If	remote sense is	not required, local sense must be used		
Enable	Output must	be enabled. S	ee application n	otes, power sup	pply is shipped with enable links fitted		
Current Share	5 supplies ca	an share within	5%				
Standby Output	5V at 0.5A. p	resent whenev	ver AC is applied	(9V at 0.3A. us	er selectable, by connecting 'VSET', Pin 8 of CN2 to 'GND')		

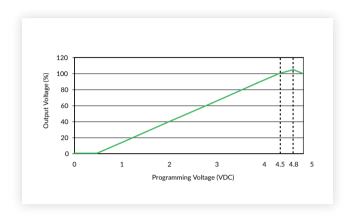
Notes:

 ${\bf 1.}\, {\bf Tolerance}\, {\bf includes}\, {\bf setup}\, {\bf time}\, {\bf tolerance}, \\ {\bf line}\, {\bf regulation}\, {\bf and}\, {\bf load}\, {\bf regulation}.$

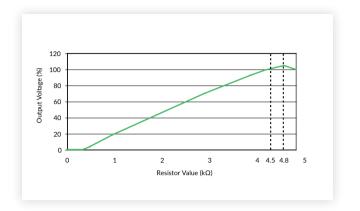
Output

Output Voltage Programming

Via External Voltage

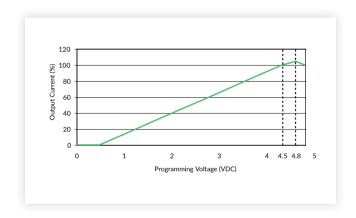


Via External Resistor

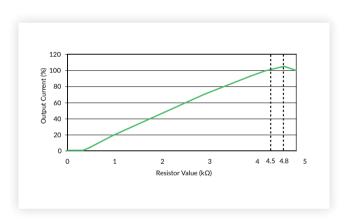


Output Current Programming

Via External Voltage



Via External Resistor



General

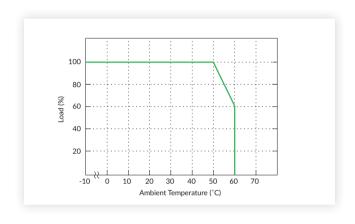
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	89		93	%	See Models and Ratings
Isolation: Input to Output	3000			VAC	
Input to Ground	1500			VAC	
Output to Ground	500			VAC	
0 11 11 -		65		1.11-	PFC converter
Switching Frequency	40		200	kHz	PWM, variable
Power Density			8.1	W/in³	
Signals and Controls					Enable, Current Share, V Program, I Program, 5V Standby, Power OK
Mean Time Between Failure		90		khrs	MIL-HDBK-217F, Notice 2 25°C GB
Weight		11.57 (5.25)		lb (kg)	

Environmental

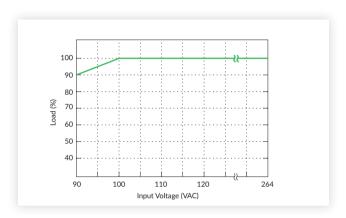
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-25	-25 +60 °C Derate linearly from 100% load at 50°C		Derate linearly from 100% load at 50°C to 60% load at 60°C	
Storage Temperature	-40		+85	°C	
Cooling	Internal fan f	Internal fan fitted, speed increases with load and internal temperature			emperature
Humidity	20	20 90 %RH			
Vibration			2	g	10-500 Hz, 10 min/cycle, 60 min period for each axis, compliant to IEC68-2-6, IEC 68-2-64

Derating Curve

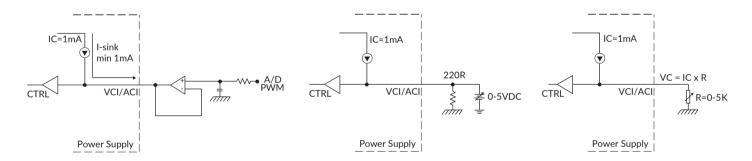
Thermal Derating Curve



Input Derating Curve



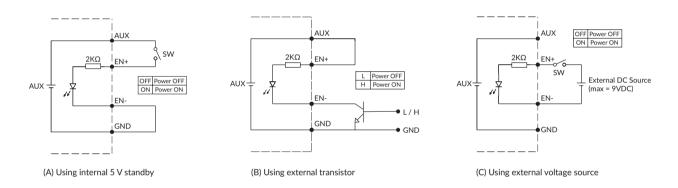
External Programming Voltage Connection



Signals & Controls

LED Status	Output Status			
Solid (Green)	DC Output OK			
Solid (Orange)	DC Output OK in remote control mode			
Slow Blink (Green)	Output Not Enabled			
Slow Blink (Orange)	Output Not Enabled in remote control mode			
Fast Blink (Red)	Over Voltage			
Solid (Red)	Over Loaded			
Slow Blink (Red)	Over Temperature			
Intermittent Blink (Red)	Fan Fail			
Short & Long Blink (Red)	AUX Standby Failure			

Remote Enable



*GND shown in above diagram is referring to the GND of CN2, not the grounding from output power (NEG (-))

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class A	
Radiated	EN55032	Class A	
Harmonic Currents	EN61000-3-2	Class A	
Voltage Flicker	EN61000-3-3		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	2/3	Α	±4kV contact, ±8kV air discharge
Radiated	EN61000-4-3	3	Α	
EFT/Burst	EN61000-4-4	3	Α	10V/m
Surges	EN61000-4-5	Installation class 3	Α	
Conducted	EN61000-4-6	3	Α	10V/m
Magnetic Field	EN61000-4-8	3	Α	30A/m
		Dip 30% 500ms	A/B	High line/Low line
Dips and Interruptions	EN55035	Int >95% 10ms	Α	
		Int >95% 5000ms	В	

Safety Approvals

Certification	Standard	Notes & Conditions		
СВ	IEC62368-1			
UL	UL62368-1, CSA C22.2 No 62368-1-14	Information Technology		
TUV	EN62368-1			
CE	Meets all applicable directives			
UKCA	Meets all applicable legislation			

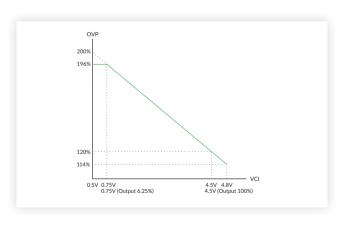
Application Notes

POK Signal

Power not OK Power OK CN2 Connector

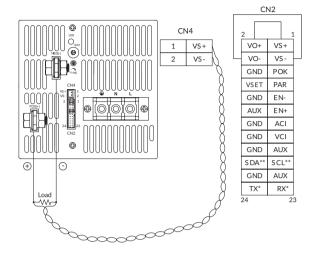
Open drain signal, low when PSU turns on Maximum sink current: 20mA Maximum drain voltage: 40V

OVP Setting

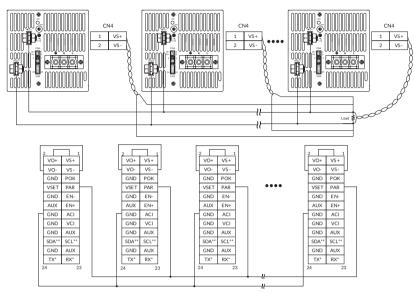


Application Notes

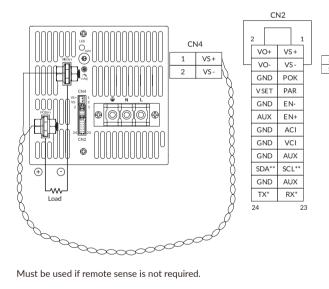
Remote Sense



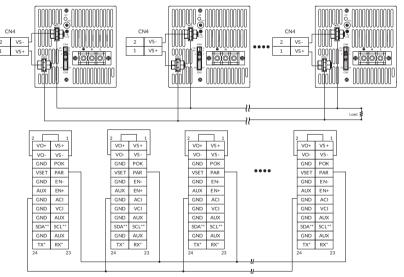
Current Share with Remote Sensing



Local Sense



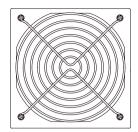
Current Share with Local Sensing

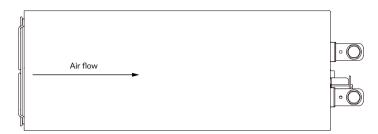


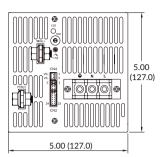
Notes:

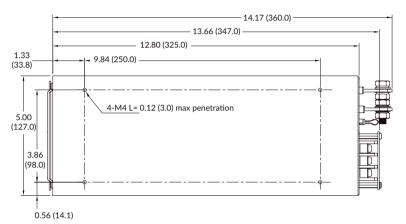
In parallel operation, it is possible that only one unit will operate if the load is less than 5% of the combined rated output load. *Pin 23 and 24, only usable with driver board "KIT-RS232-X" or "KIT-RS485-1". **If units are connected in parallel, and the I²C bus is used on each of them, then each I²C bus must be isolated to the others.

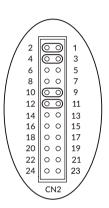
Mechanical Details











Pin	Function					
1	ACL					
2	ACN					
3						

CN4	CN4 Control Pin Connections					
Pin	Function					
1	+VS					
2	-VS					

	CN2 Control Pin Connections									
Pin	Function	Description	Pin	Function	Description	Pin	Function	Description		
1	VS+	Remote Sense (+)	9	EN-	Inhibit On/Off (-)	17	AUX	+5V/0.5A or +9V/0.3A Standby power		
2	VO+	Positive Output Voltage	10	GND	Ground	18	GND	Ground		
3	VS-	Remote Sense (-)	11	EN+	Inhibit On/Off (+)	19	SCL**	I ² C Serial Clock		
4	VO-	Negative Output Voltage	12	AUX	+5V/0.5A or +9V/0.3A Standby power	20	SDA**	I ² C Serial Data		
5	POK	Power OK	13	ACI	I Program	21	AUX	+5V/0.5A or +9V/0.3A Auxiliary power		
6	GND	Ground	14	GND	Ground	22	GND	Ground		
7	PAR	Parallel Operation Current Share	15	VCI	V Program	23	RX*	Receive		
8	VSET	AUX Output Setting	16	GND	Ground	24	TX*	Transmit		

Notes:

- 1. Dimensions shown in inches (mm).
- 2. Weight: 11.57 lb (5.25 kg)
- 3. Mating Connector: CN2 JST PHDR-24VS Housing, SPHD-002T-P0.5 Contact
- 4. Mating connector: CN4 JST XHP-2 Housing SXH-001T-P0.6 Contact
- *Only usable with driver board "KIT-RS232-X" or "KIT-RS485-1".
- **If units are connected in parallel, and the I2C bus is used on each of them, then each I2C bus must be isolated to the others.