

HFE1600 SERIES SPECIFICATIONS:

		HFE1600-12	HFE1600-24	HFE1600-48	
1	Rated output voltage	V	12	24	48
2	Output voltage set point	V	12+/-1%	24+/-1%	48+/-1%
3	Output voltage range	V	9.6~13.2	19.2~29.0	38.4~58
4	Rated Output Current at Vin > 170Vac	(*1) A	133	67	33
5	Rated Output Current at 100 ≤ Vin ≤ 132Vac	(*1) A	100	50	25
6	Rated Output Current at 85V ≤ Vin < 100Vac	(*1) A	Linear derating 1% per 1Vac from output current at 100Vac.		
7	Rated output power Vin > 170Vac	W	1596	1608	1584
8	Rated output power 100 ≤ Vin ≤ 132Vac	W	1200	1200	1200
9	Rated output power 85Vac ≤ Vin < 100Vac	W	Linear derating 1% per 1Vac from output power at 100Vac.		
10	Input voltage / frequency range	(*2)(*15) ---	85~265Vac continuous, 47~63Hz, Single phase		
11	Maximum input current (at 115/230Vac)	A	12.4/8.1		
12	Power Factor (Typ) (at 115/230Vac)	---	>0.99/0.98 at maximum output power		
13	Efficiency at 75% rated load (Typ)	(*3) %	87/90	88/90	89/92
14	Efficiency at 100% rated load (Typ)	(*3) %	87/90	87/90	88/91
15	Inrush current	(*4) A	Less than 35		
16	Hold-up time	ms	≥ 10ms typical at 115/230Vac input, rated output voltage and less than 80% of rated load.		
17	Maximum line regulation	(*5) %	0.25		
18	Max load regulation	(*6) %	0.50		
19	Output Ripple and noise P-P	(*7) 0~+70°C mV	240	240	480
		-10~0°C mV	360	360	780
20	Temperature stability	---	0.05% of rated Vout for 8hrs after 30min warm-up. Constant line, load and temperature.		
21	Temperature coefficient of output voltage	ppm/°C	+/-200		
22	Remote sensing	(*8) ---	Possible. Refer to Instruction Manual.		
23	Parallel operation	(*9) ---	Possible. Single wire current share, 5% accuracy of rated Iout, up to 10 units of the same voltage rating		
24	Series operation	---	Possible (with external diodes), 2 units. Refer to Instruction Manual.		
25	Over current protection	85V ≤ Vin < 132Vac --- 170V ≤ Vin < 265Vac ---	Minimum 105% of rated output current 105~120% of rated output current.		
26	Over voltage protection	(*10) V	Tracking OVP, range: 1.1xVout, accuracy: +/-3%, refer to Instruction Manual		
27	Over temperature protection	---	Inverter shut down method, automatic recovery		
28	Remote On/Off control	---	Two complementary inputs. By electrical signal or dry contact. Refer to Instruction Manual.		
29	"DC OK" signal	(*13) ---	Tracking, On when Vout>90+/-5% of output voltage setting		
30	Over-Temperature warning	(*13) ---	Refer to Instruction Manual.		
31	"AC FAIL" signal	(*13) ---	On when 85Vac<Vin<270Vac.		
32	Auxiliary power supply output	(*11) ---	11.2~12.5V, 0.5A. 240mVp-p ripple and noise		
33	Vout programming by external voltage	---	By 0~5V, equal to Vout min ~ Vout max. Refer to Instruction Manual.		
34	Vout programming by external resistor	---	By 1Kohm potentiometer. Refer to Instruction Manual.		
35	Front panel indicators	---	AC OK, DC OK/FAIL		
36	I ² C Interface	---	Optional, PMBus compatible. Refer to Instruction Manual.		
37	Operating temperature	---	-10~+50°C: 100% load. +50°C to +60°C Derate 2%/°C of load +60°C to +70°C Derate 2.5%/°C of load		
38	Storage temperature	---	-30~85°C		
39	Operating humidity	---	10~90% RH, no condensation.		
40	Storage humidity	---	10~95% RH, no condensation.		
41	Cooling	---	By internal Fans. Variable speed control based on ambient temperature and power level.		
42	Vibration	---	Built to meet IEC60068-2-64 (Basic Transportation)		
43	Shock	---	Built to meet IEC60068-2-27 (Basic Transportation)		
44	Conducted emission	(*14) ---	Built to meet EN55032 Class B, FCC part 15 Class-B, VCCI Class-B		
45	Radiated emission	---	Built to meet EN55032 Class A, FCC part 15 Class-A, VCCI Class-A		
46	Immunity	---	Built to meet IEC61000-4-2 (Level 2,3), -3 (Level 2), -4 (Level 2), -5 (Level 3,4), -6 (Level 2), -8 (Level 4), -11		
47	Applicable safety standards	---	IEC 62368-1 UL62368-1 CSA22.2 No.62368-1 EN62368-1.		
48	Withstand voltage	Input-Output: --- Input-Ground: --- Output - Ground: ---	3000Vrms, 1min. 2000Vrms, 1min. 500Vrms, 1min. 2250Vdc, 1min.		
49	Isolation resistance	---	More than 100Mohm at 25°C and 70% RH. Output-Ground: 500Vdc		
50	Leakage current	(*12)(*15) mA	Less Than 0.75/1.5 at 115/230Vac range		
51	Weight (Typ)	Kg	Max. 1.55		
52	Size (W*H*D)	---	85x41x300mm. Refer to Outline Drawing.		

Notes:

- *1 Refer to Fig. 1
- *2 For cases where conformance to various safety standards (UL, EN etc.) is required, to be described as 100-240Vac (50/60Hz)
- *3 At 115/230Vac, 25°C ambient temperature.
- *4 Not applicable for the noise filter inrush current less than 0.2ms
- *5 From 85~132Vac or 170~265Vac, constant load.
- *6 From No-load to Rated load, constant input voltage. Measured at the sensing point in Remote sense
- *7 Measured with JEITA-RC9131A 1:1 probe with 2x270uF electrolytic capacitors and 1uF film capacitor on the output, 20MHz B.W. When Power Supplies are installed in HFE1600-S1U shelf, measured with 1uF film capacitor on the output terminals of the HFE1600-S1U.
- *8 Voltage drop on load wires: HFE1600-12: 0.25V/wire, HFE1600-24: 0.5V/wire, HFE1600-48: 1V/wire
- *9 Accuracy applicable for load current > 50% of rated output current. Derate maximum output power by 5%
- *10 Inverter shut down method. Reset by AC voltage recycle or by On/Off control
- *11 Measured with JEITA-RC9131A 1:1 probe with 470uF electrolytic capacitor and 0.1uF film capacitor on the output, 20MHz B.W. Capacitors are not required when the Power Supply is installed in HFE1600-S1U shelf.
- *12 Measured according to UL, EN method at 60Hz, 25°C ambient temperature
- *13 Open collector signal. Maximum sink current: 10mA, maximum voltage 15V
- *14 HFE1600 series considered as professional equipment and not intended for sale to generic public
- *15 Possible to operate at Input frequency 400Hz +/-10%, leakage current would increase to 6mA/12mA at 115/230Vac, Power factor would decrease. However the operation of the power supply is normal. Safety certification is for frequency range 47~63Hz only

Vin(AC)	Model			
	V/I	HFE1600-12	HFE1600-24	HFE1600-48
85V	V1 (V)	12	24	48
	V2 (V)	13.2	29	58
100~132V	I1 (A)	76	34	17
	I2 (A)	85	42.5	21
170~265V	I1 (A)	91	42	21
	I2 (A)	100	50	25
170~265V	I1 (A)	121	56	28
	I2 (A)	133	67	33

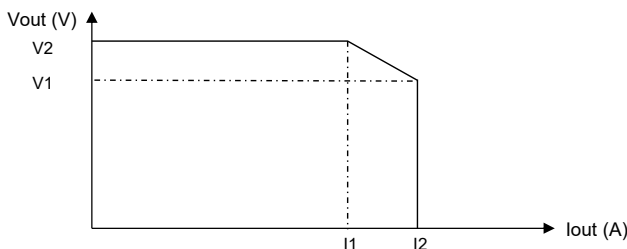


Fig. 1: Rated output current

HFE1600 SERIES I2C SPECIFICATIONS:

1. FEATURES

1.1 Output voltage measurement
1.2 Output voltage programming
1.3 Output current measurement
1.4 Internal ambient temperature measurement
1.5 Product information
1.6 Status information
1.7 SMBus alert
1.8 Clock frequency : 100KHz
1.9 Address lines : 4

1. OUTPUT VOLTAGE MEASUREMENT

		HFE1600-12	HFE1600-24	HFE1600-48
1.1 Measurement accuracy	-	+/-2% of full scale, Refer to instruction manual		
1.2 Measurement resolution	-	10 bit		
1.3 Measurement range (Full Scale)	V	0~15	0~30	0~60

2. OUTPUT VOLTAGE PROGRAMMING

		HFE1600-12	HFE1600-24	HFE1600-48
2.1 Programming accuracy	-	+/-2% of full scale		
2.2 Programming resolution	-	10 bit		
2.3 Programming range	V	9.6~13.2	19.2~29.0	38.4~58

3. OUTPUT CURRENT MEASUREMENT

		HFE1600-12	HFE1600-24	HFE1600-48
3.1 Measurement accuracy	-	+/-10% of full scale		
3.2 Measurement resolution	-	10bit		
3.3 Measurement range (Full Scale)	A	0~160	0~80	0~40

4. INTERNAL AMBIENT TEMPERATURE MEASUREMENT (Refer to Instruction Manual)

4.1 Measurement device accuracy	-	±3°C
4.2 Measurement resolution	-	10bit
4.3 Measurement range	°C	0~100

5. PRODUCT INFORMATION

5.1 Factory programmed	-	Product ID
5.2 Factory programmed	-	Model Name
5.3 Factory programmed	-	Revision
5.4 Factory programmed	-	Serial Number
5.5 Factory programmed	-	Manufacturing location
5.6 Factory programmed	-	Coefficients

6. STATUS INFORMATION

6.1 "FAN FAIL" Signal	-	"1"-FAIL, "0"-OK
6.2 "DC FAIL" Signal	-	"1"-FAIL, "0"-OK
6.3 Output "OVP" Signal	-	"1"-OVP, "0"-OK
6.4 "TEMPERATURE ALARM" Signal	-	"1"-ALARM, "0"-OK
6.5 "OTP" Signal	-	"1"-OTP, "0"-OK
6.6 "AC FAIL" Signal	-	"1"-FAIL, "0"-OK
6.7 I2C ON/OFF Control	-	"1"-ON, "0"-OFF
6.8 "SMB ALERT" Signal	-	"1"-OK, "0"-ALERT