创联电源
CHUANGLIAN POWER SUPPLY

Industrial Power Supply Datasheet

A-1600FKM-Series

A-1600FKM-XP

◇ Product Category: 1600Watts Industrial Power Supply
◇ Version No.:R1.0
◇ Issued Date: Jul.23rd,2024

CHUANGLIAN

Product Features

- Universal Input Voltage Range: 90-264VAC/120-370VDC
- PFC>0.95
- LED power indicator
- Built-in DC fan forced cooling, fan temperature control design
- With output remote voltage compensation, output switch control and DC OK signal
- All-around Protection Function: SCP, OVP, OCP,OTP
- Active parallel up to 6400W
- Operating Temperature: -30℃~+75℃ (Refer to "Derating Curve")
- 3 Years warranty

CE RoHS

Product Description

A-1600FKM-XP series product is an 800W air-cooled metal case industrial power supply. The entire series voltage input range 90-264VAC/120-370VDC, provides an output voltage of 12V, 15V, 24V, 27V,36V, 48V and 55V for option. It can be adapted to different load application and meet various industrial application requirements. Besides, the EMC and safety regulations comply with the IEC/EN/UL62368, GB4943 standards. High conversion efficiency, compact housing design, good heat dissipation, and all-round protection guarantee the high reliability and stability of this power supply.

Applications

Industrial control system, Mechanical and electrical equipment, Electronic instruments and equipment, Industrial automation machinery, Semiconductor device

Model Encoding

A-1600 FKM-X-P-YY

- YY: Internal code (Blank or alphanumeric combination
- P: PFC function
- X: output voltage (12V, 15V, 24V, 36V, 48V etc.))
- FKM: Series
- 1600: output power
- A: single channel output

◎ Model List:

Model	Output Power (W)	Output Voltage (V_{dc})	Output voltage adjustable range[3] (V_{dc})	Output Current (A)	Ripple and noise(mV)[2]	Efficiency @ 230VAC (Typ.) [1]	Maximum capacitive load(uF)
A-1600FKM-12P※	1510	12	12-14.4	0-125	200	91%	40000
		5	-	0-2.0	250	-	1000
A-1600FKM-24P	1610.8	24	24-28.8	0-66.7	250	93%	10000
		5	-	0-2.0	250	-	1000
A-1600FKM-36P※	1612	36	36-43.2	0-44.5	250	93%	6000
		5	-	0-2.0	250	-	1000
A-1600FKM-48P※	1608.4	48	48-52	0-33.3	250	93%	4000
		5	-	0-2.0	250	-	1000
A-1600FKM-55P※	1616	55	53-58	0-29.2	250	93%	3000
		5	-	0-2.0	250	-	1000

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Changzhou Chuanglian Power Supply Technology Corporation

Note: [1] All Parameters not specially mentioned are measured at rated input voltage, full load and 25℃ ambient temperature.

[2] Ripple & noise are measured at 20MHz of oscilloscope bandwidth(oscilloscope probe cap and ground clamp are removed)by using a 20±2cm twisted pair-wire terminated with a 47uF electrolytic capacitor and a 0.1uF high frequency capacitor that are connected in parallel at the output end.

[3] Under any steady operating condition, the total output power shall not exceed the rated output power. When the output voltage is raised, the total output power cannot exceed the rated output power. When the output voltage is turned down, the output current cannot exceed the rated output current.

※ For the product models under development, please contact our sales team or distributor for more information.

◎Input Specification:

Parameter	Min.	Typ.	Max.	Notes
Input AC Voltage	90 V_{ac}		264 V_{ac}	
Rated Input AC Voltage	100 V_{ac}		240 V_{ac}	
Input DC Voltage	120 V_{dc}		370 V_{dc}	
Input Frequency	47 Hz		63 Hz	
Maximum Input Current			18 A	115Vac/full load
			9 A	230Vac/full load
PFC	0.96			115Vac,full load
	0.95			230Vac,full load
Leakage Current			2 mA	240Vac/50Hz
Surge Current		20 A		115Vac,cold start
		40 A		230Vac,cold start

◎ Output Specifications:

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-1.0%		+1.0%	All models
	-2.0%		+2.0%	5V auxiliary source
Line Regulation	-0.5%		+0.5%	All models
	-0.5%		+0.5%	5V auxiliary source
Load regulation	-1.0%		+1.0%	All models
	-2.0%		+2.0%	5V auxiliary source
Accuracy of current sharing[4]	-5%		+5%	When used in parallel, each unit carries more than 50% rated load
Turn On Delay Time			2000ms	115Vac/230Vac,full load
Rise Time			100ms	115Vac/230Vac.full load
Stand-by power consumption	8 ms			115Vac/230Vac, full load

Note: [4] Calculation formula flow balancing accuracy=(Io_max-Io_min)/ Io_max*100%
Io_max: the maximum output current of the parallel power supply, and Io_min: the maximum output current of the parallel power supply

◎ Efficiency:

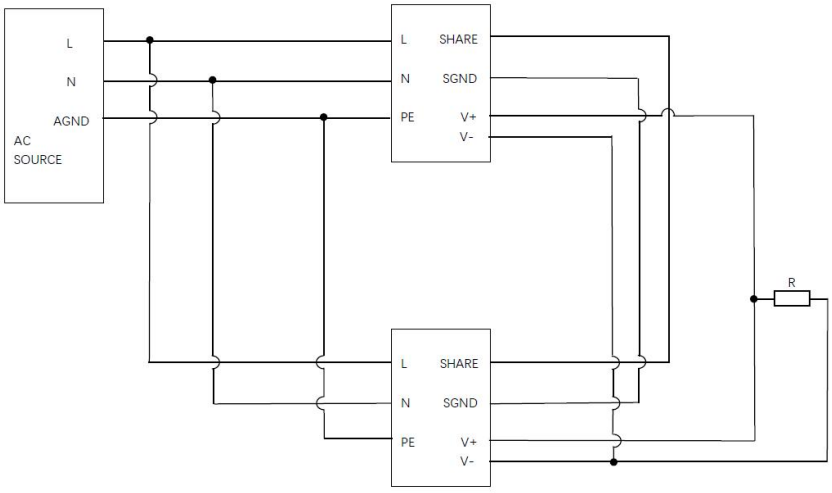
Parameter	Min.	Typ.	Max.	Notes
Efficiency@115 V_{ac}				
A-1600FKM-12P	88%	89%		Ambient temp. 25±5°C, full load
A-1600FKM-24P	90%	91%		
A-1600FKM-36P	90%	91%		
A-1600FKM-48P	90%	91%		
A-1600FKM-55P	90%	91%		
Efficiency@230 V_{ac}				
A-1600FKM-12P	90%	91%		Ambient temp. 25±5°C, full load
A-1600FKM-24P	92%	93%		
A-1600FKM-36P	92%	93%		
A-1600FKM-48P	92%	93%		
A-1600FKM-55P	92%	93%		

◎Function overview:

Function	Description
Temperature control fan	Fan speed is temperature-dependent and linearly adjusted (normally on)
Remote compensation	S+/S-, the signal line needs to be connected to the positive and negative terminals of the load terminal, and the load line voltage drop compensation is up to 0.2V. For detailed application instructions, contact FAE to obtain the A-1600FKM Power Supply Application Manual.
Output ON/OFF control	RC+/RC-, please contact FAE for the A-1600FKM Power Supply Application Manual. High level or open circuit: off; , short circuit or low level: on; Low: < 1.2V; High level: 4~10V
Auxiliary power	5V 2A Independent auxiliary power supply, see output feature "AUX 5V" (optional)
Current sharing	4 parallel up to 6400W. Current sharing accuracy ±5%(load 50% and above) (optional)

◎Current sharing function:

A-1600FKM series products have active current sharing function and support up to 4 parallel devices to provide higher output power. The parallel connection diagram is as follows:



Notes:

1. Wires of the same specification and length must be used between the output end of each parallel power supply and the final load R to ensure balanced distribution.
2. If the terminal load R exceeds the overcurrent point of a single power supply, try to ensure that the electrical connection conditions from the AC power supply to each power supply are correct to prevent the power supply from starting into protection mode.
3. This method is now commonly used to build power expansion, that is, N power supplies are connected in parallel to support the maximum load current N*Iomax, where Iomax is the rated output current of each power supply. This power supply supports up to 4 power supplies in parallel for current sharing.
4. When using the current sharing function, first power on and do not directly add a load to the system that exceeds the rated load of a single product.
5. When any power supply in parallel connection fails, the operation of other power supplies will not be affected.
6. In actual application, the current of each power supply may not be completely balanced.

◎Protection:

Parameter	Min.	Typ.	Max.	Notes
Over Load	110%		150%	Hiccup mode, recovers automatically after fault condition is removed
Output over voltage	115%Vo		145%Vo	When the power supply overvoltage protection, output constant voltage; When the fault is rectified, the output automatically recovers to normal
Over-temperature protection (ambient temperature)		/		over-temperature fault, the power output is turned off. When fault is resolved, resumes normal output.
Short circuit	When output side has short circuit fault, recovers automatically after fault condition is removed.			
Input undervoltage protection	75 Vac	80 Vac	85 Vac	When the input voltage rises to 80~90V or above, the output is automatically restored
Input overvoltage protection	270 Vac	280 Vac	290 Vac	When the input voltage drops to 260~280V or below, the output is automatically restored

◎Safety & EMC:

Safety Category	Country/ Territory	Item	Standards
UL/CUL	USA/ Canada	Safety Standard	UL 62368-1
			CAN/CSA C22.2 No. 62368-1:19
CE	Europe		EN 62368-1
CB	CB Countries		IEC 62368-1
CCC	China		GB 4943.1

EMI Category	Country/ Territory	Item	Standards/Criteria	
FCC	USD/ Canada	Conducted Emission	FCC part 15(ANSI C63.4)	Class B
		Radiated Emission	FCC part 15(ANSI C63.4)	Class B
CE	Europe	Conducted Emission	EN 55032	Class B
		Radiated Emission	EN 55032	Class B
		Harmonic Current	EN 61000-3-2	Class A
		Voltage Flicker	EN 61000-3-3	
CCC	China	Conducted Emission	GB/T 9254.1	Class B
		Radiated Emission	GB/T 9254.1	Class B
		Harmonic current	GB/T 17625.1	Class A

EMI Category	Country/ Territory	Item	Standards/Criteria		
CE	Europe	Electro-static Discharge	EN 61000-4-2	Air 8 kV / Contact 6 kV	Criteria A
		Radiated Susceptibility	EN 61000-4-3	80MHz–1GHz 10V/m	Criteria B
		Electrical Fast Transient	EN 61000-4-4	±2KV	Criteria B
		Surge Immunity	EN 61000-4-5	CM±4KV/DM ±2KV	Criteria A
		conducted Emission Immunity	EN 61000-4-6	10Vr.m.s	Criteria B
		Power Frequency Magnetic Field Immunity	EN 61000-4-8	30A/m, continuous	Criteria A
				300A/m, 1 s	Criteria A
		Voltage Dips, Drops and Interruptions Immunity	EN 61000-4-11	Drop 100%, 0.5 cycle	Criteria B
				Drop 100%, 250 cycle	Criteria B
				Drop 30%, 25 cycle	Criteria B
				Interrupt 100%, 250 cycles	Criteria C

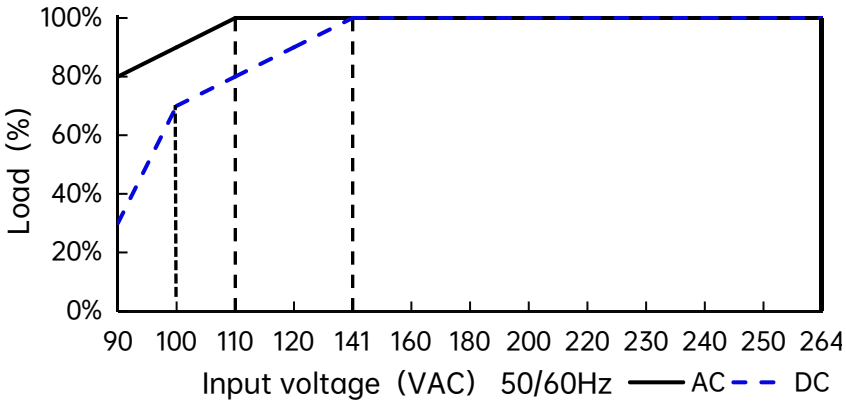
Note: The power supply is considered as a component which will be installed into a final equipment. All the EMC tests are be executed by mounting the unit on a metal plate with size 400mm*400mm*3mm. The final equipment must be re-confirmed that it still meets EMC directives.

◎General Specifications:

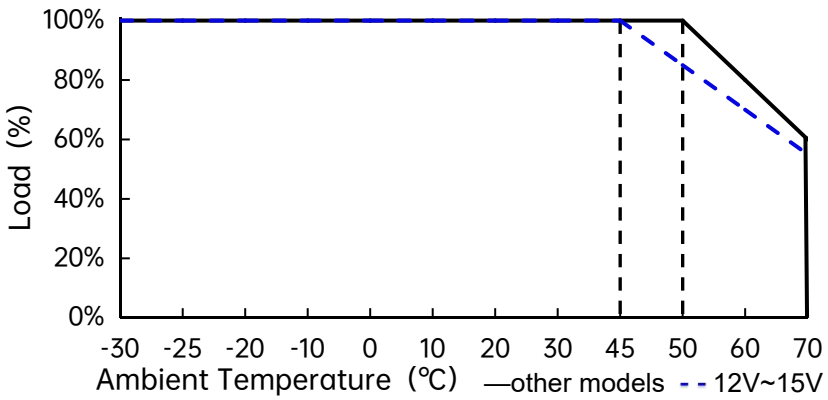
Parameter		Min.	Typ.	Max.	Notes
Dielectric Strength[4]	Input-Output	3000 V_{ac}			Last for 60s, leakage current < 10mA
	Input-PE	1800 V_{ac}			
	Output-PE	500 V_{ac}			
Insulation Resistance	Input-Output	100MΩ			Test Voltage: 500Vdc
	Input-PE	100MΩ			
	Output-PE	100MΩ			
Working Temp.		-30°C		+70°C	Refer to "Derating Curve"
Working Humidity		20%RH		95%RH	Non-condensing
Storage Temp.		-40°C		+85°C	
Storage Humidity		10%RH		95%RH	Non-condensing
Temp. Coefficient		-0.03%/℃		0.03%/℃	0~50℃
Mean Time Between Failure(MTBF)		1000000 hours			Ambient temp. 25℃, MIL- HDBK-217F
Dimension		245*127*40.5mm			L*W*H
Net Weight			1370g		
Packing		8PCS/16Kg/Carton，Carton Dimension：290(L)*270(W)*200(H)mm			

◎Performance Curve:

AC input voltage VS. Output power

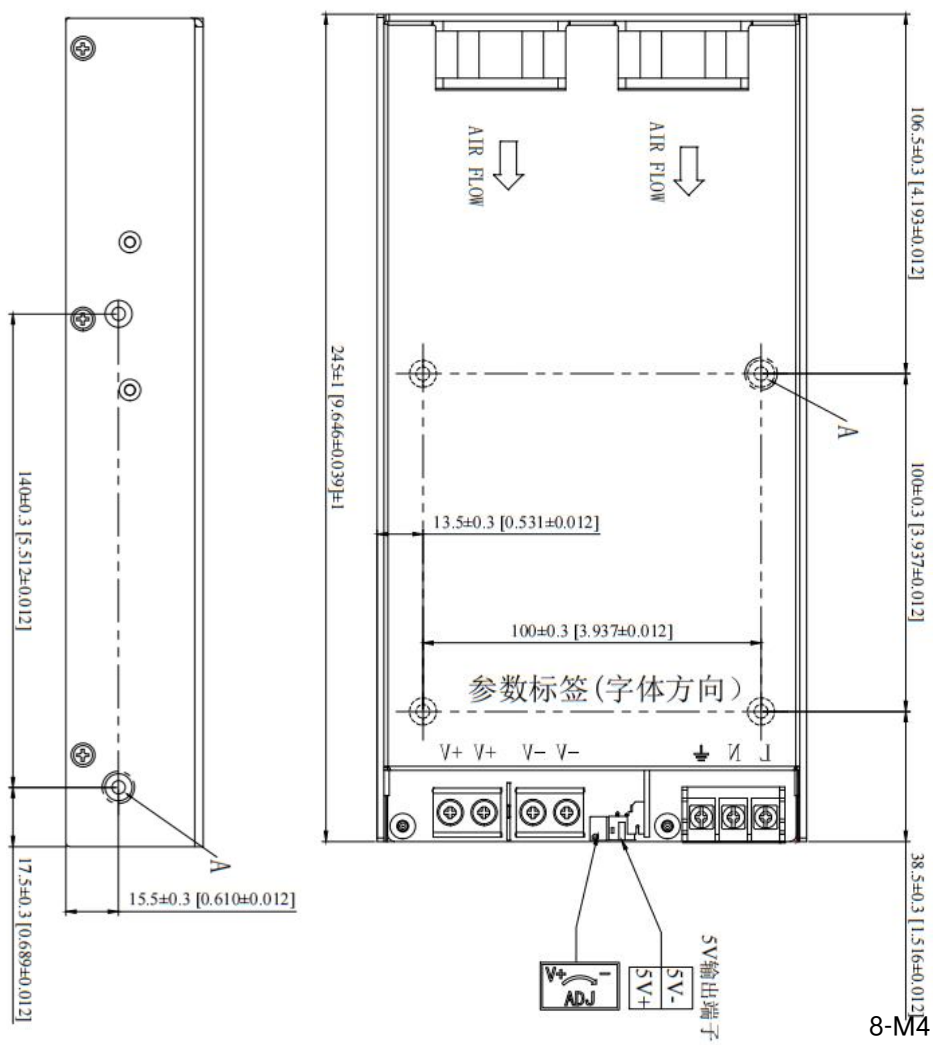


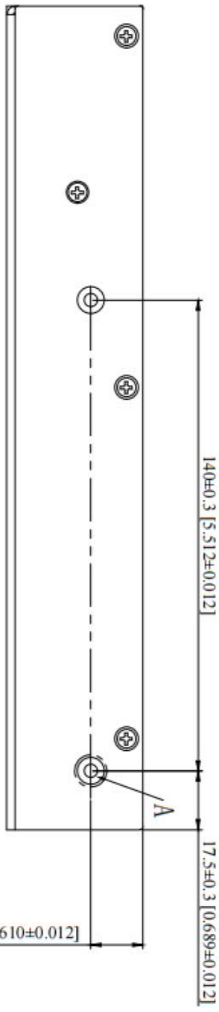
Working ambient temperatureV VS. Output power

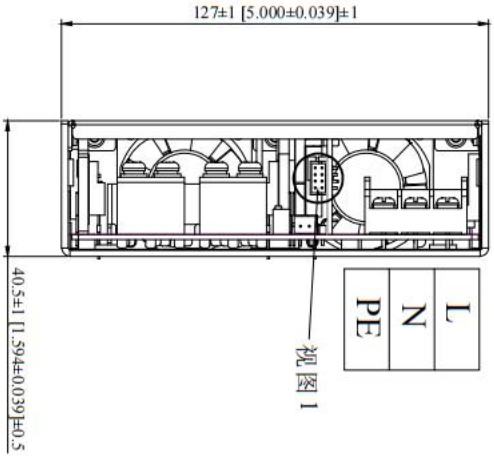


Notes:
1. If you need to know more detailed test data during application, please contact our technical support to obtain application notes of the corresponding product.
2. This product is suitable for use in natural air convection environments. If used in a closed environment, please consult our technical support staff.

◎Mecanical Specification:







8-M4 Mounting holes for the customer system
Mounting screw: M4*8
Installation torque :8Kgf.cn(0.8N.m)
Screw into the housing is not more than 3mm
Unit: mm[inch]; The unmarked tolerance ±0.5[±0.020]

Input/Output pin function

Pin	Function	Screw Torque
L	AC LINE	screw: M4×7 torque: 10 Kgf·cn(1.0 N·m)
N	AC NETURAL	
⏚	EARTH	
V-	DC output -	screw: M4×7 torque: 10 Kgf·cn(1.0 N·m)
V+	DC output +	
RC+	Output ON/OFF control signal+	
RC-	Output ON/OFF control signal-	
PG	Power Good	
SHARE	Share control	
GND	GND	
5V	AUX 5V	

◎Installation requirements

In order to ensure that this product meets the electrical performance requirements declared in the specification, this product must be installed on an aluminum plate or metal casing.
The recommended dimensions of the aluminum plate are as shown in the figure below (unit: mm).
At the same time, the product must be tightly installed in the center of the aluminum plate with screws, and thermal conductive silicone grease should be applied to assist in its heat dissipation.