500 Watts

VER:A\_9



ARF500U SERIES

## **KEY FEATURES**

- Universal Input 90-264Vac
- 500 Watt with 30CFM Forced Air
- 450W with Conduction Cooling
- 330W with Natural Convection
- High Efficiency up to 92%
- Safety Approval to UL / IEC / EN 62368-1
- -30°C to +80°C Wide Range Operation Temperature
- Operating Altitude 5000M
- Active PFC Function
- I/O Isolation 4000VAC
- Built-in 12V/0.3A Auxiliary Output
- Standby 5V@1A with Fan, @0.4A without Fan
- 3-Year Product Warranty





### **ELECTRICAL SPECIFICATIONS**

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

ge (with 30CFM FAN) (W) ge (Conduction Cooling) (W) ge (Natural Convection) (W) oltage requency (Hz)	(Note 6)	,	ARF500U-24S	ARF500U-48S		
ge (Conduction Cooling) (W) ge (Natural Convection) (W) pltage	· · · · · ·	400 W (100 VAC) / 450 W (	220 \/AC\			
ge (Natural Convection) (W)	· · · · · ·	,	220 \/AC\	500 W		
oltage	(Note 2)		400 W (100 VAC) / 450 W (230 VAC)			
<u> </u>	(Nloto 2)	250 W (100 VAC) / 330 W (	230 VAC)			
requency (Hz)	Voltage (Note 3)		C			
		47-63 Hz				
urrent (Full load)		<6.3 A max. (115 VAC) / <3	.15 A max. (230 VAC)			
rush Current (<2ms) (Clod Start	)	< 40 A max. (115 VAC) / < 8	30 A max. (230 VAC)			
eakage Current		< 0.1 mA / 264 VAC (Touch	Current)			
ower Factor (at 230 VAC)		PF>0.94 at Full Load				
oltage (V.DC.)		12V	24V	48V		
oltage Adj Range (V.DC.)		±5% Output Voltage				
oltage Accuracy		±2%				
Current (with 30CFM FAN) (A) (max.)		41.5	20.8	10.41		
Current (Conduction Cooling) (A) (max.)	at 100 VAC	33.3	16.6	8.33		
	at 230 VAC	37.5	18.75	9.375		
urrent	at 100 VAC	20.83	10.42	5.21		
(Natural Convection) (A) (max.)	at 230 VAC	27.5	13.75	6.87		
ne Regulation (100-264 VAC)		±1%				
oad Regulation (10-100%) (typ.)		±1%				
inimum Load		1%				
aximum Capacitive Load		5,000μF	2,500μF	1,250μF		
ipple & Noise (typ.)	(Note 1)	160mV	240mV	480mV		
fficiency (at 230VAC)		90.5%	91%	92%		
old-up Time (at 115 VAC)	(Note 2)	8 ms min.				
ver Power Protection		Auto recovery				
ver Voltage Protection		Auto recovery				
ver Temperature Protection		Auto recovery				
la aut Oivavit Duata atiau		Protection level 1 (nominal) : Continuous, Auto recovery				
Short Circuit Protection		Protection level 2 (instantaneous high current) : Latch				
put-Output	(Note 5)	4000VAC or 5656VDC				
put-PE	(Note 5)	2000VAC or 2828VDC				
utput-PE	(Note 5)	1500VAC or 2121VDC				
	rush Current (<2ms) (Clod Start rakage Current  ower Factor (at 230 VAC)  oltage (V.DC.)  oltage Adj Range (V.DC.)  oltage Accuracy  urrent (with 30CFM FAN) (A) (m  urrent conduction Cooling) (A) (max.)  urrent latural Convection) (A) (max.)  one Regulation (100-264 VAC)  ond Regulation (10-100%) (typ.)  ficiency (at 230VAC)  old-up Time (at 115 VAC)  over Power Protection  over Voltage Protection  over Temperature Protection  out-Output  put-PE	rush Current (<2ms) (Clod Start)  rakage Current  ower Factor (at 230 VAC)  oltage (V.DC.)  oltage Adj Range (V.DC.)  oltage Accuracy  urrent (with 30CFM FAN) (A) (max.)  at 100 VAC  at 230 VAC  one Regulation (100-264 VAC)  ond Regulation (10-100%) (typ.)  onimum Load  aximum Capacitive Load  opple & Noise (typ.) (Note 1)  old-up Time (at 115 VAC) (Note 2)  over Power Protection  over Voltage Protection  over Voltage Protection  over Temperature Protection  out-Output (Note 5)  out-PE (Note 5)	rush Current (<2ms) (Clod Start)  eakage Current  cover Factor (at 230 VAC)  obtage Adj Range (V.DC.)  obtage Accuracy  current (with 30CFM FAN) (A) (max.)  current (with 30CFM FAN) (A) (max.)  current (at 100 VAC)  current (at 100 VAC)  dat 230 VAC)  obtage Regulation (100-264 VAC)  cover Regulation (100-264 VAC)  cover Regulation (10-100%) (typ.)  cover Power Protection  cover Power Protection  cover Voltage Protection  cover Potection  cover Protection  cover Potection   Auto recovery  cover Temperature Protection  cover Potection   Auto recovery  cover Potection   Auto recovery	Author   Carrent   Carre		

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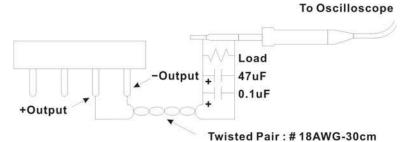
### **ELECTRICAL SPECIFICATIONS**

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Model No.		ARF500U-12S ARF500	U-24S	ARF500U-48S			
	Operating Temperature	-30°C+80°C (with derating)					
	Storage Temperature	-30°C+85°C					
	Towns and the Coefficient	±0.03%/°C ( 0~50°C )	±0.03%/°C ( 0~50°C )				
	Temperature Coefficient	±0.06%/°C ( -30~0°C )					
Environment	Altitude During Operation	5000m	5000m				
	Humidity	95% RH					
	MTBF	>160,000 h @ 25°C (MIL-HDBK-217	F)				
	Vibration	IEC60068-2-6 (10~500Hz, 2G 10mir	IEC60068-2-6 (10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes)				
	Shock	IEC60068-2-27	IEC60068-2-27				
	Dimensions (L x W x H)	5.12 x 3.27 x 1.57 Inches (130.0 x	5.12 x 3.27 x 1.57 Inches (130.0 x 83.0 x 40.0 mm) Tolerance ±0.5 mm				
Physical	Weight	605 g	605 g				
	Cooling Method	Natural Convection / Conduction Cod	Natural Convection / Conduction Cooling / 30CFM FAN				
Safety	Approval	UL 60950-1, UL / IEC / EN 62368-1					
Parameter	Standards & Level		Performa	nce			
EMI	Conducted	EN55032	Class B				
EIVII	Radiated	EN55032	Class A				
	EN 55035		Α				
	ESD	IEC 61000-4-2 Air ± 8KV , Contact ±	4KV A				
	RS	IEC 61000-4-3 3V/m	Α				
	EFT/B	IEC 61000-4-4 ± 1KV	Α				
EMS	Surge	IEC 61000-4-5 ± 1KV	Α				
	CS	IEC 61000-4-6 3Vrms	Α				
	PFMF	IEC 61000-4-8 1A/m	Α				
	Dips	IEC 61000-4-11 70% 500ms	В				
	Interruptions	IEC 61000-4-11 <5% 5000ms	В				

### NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with ceramic 0.1uF & chemi-con KY 47uF parallel capacitor.



A 30cm twisted pair of no.18 AWG copper wire is connected to a 47uF and 0.1uF capacitor of proper polarity and voltage rating. The oscilloscope probe ground led should connect right to the ground ring of the probe and be as short as possible. The oscilloscope bandwidth should be at 20MHz and connected

to AC ground.

- 2. Hold-up Time measured at 90% Vout.
- 3. Please check the derating curve for more details.
- 4. Fan output voltage will be between 10.2~13.3V, when the main output is greater than 3% of the max. load, and fan's terminal block output current is higher than 0.1A (min.)
- 5. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors from Arch power supply.

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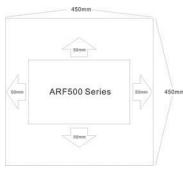


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### NOTE

6. The size of the suggested aluminum plate is shown as below. And for optimizing thermal performance, the aluminum plate must have an even and smooth surface (or coated with thermal grease), and ARF500 series must be firmly mounted at the center of the aluminum plate.

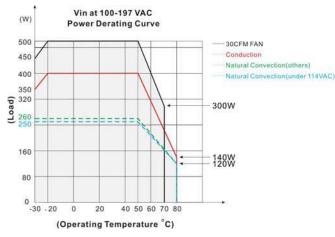
450 x 450 x 3.0 mm



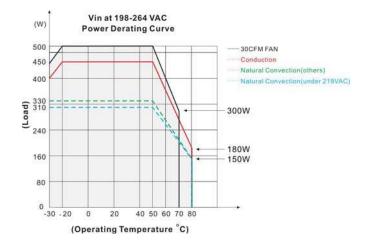
7. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

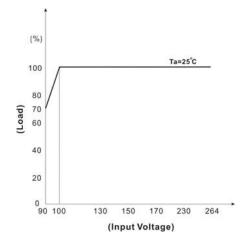
(ATTENTION: 2 poles avec fusible sur le neutre. Deconnecter le secteur avant intervention.)

## **DERATING**



If input voltage is lower than 100VAC, please refer to the output derating V.S. input voltage curve for details

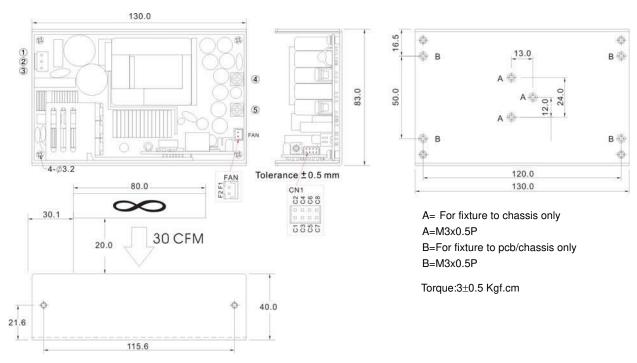






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## MECHANICAL DIMENSIONS (Top View)



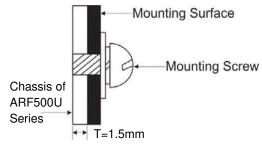
В	rands	Alex		JS	ST
PIN#	Single	Mating Terminal		Mating Housing	Terminal
A,B	PE			_	_
1	AC IN (N)				
2	NO PIN	9396-3	96T series	VHR-3N	SVH-41T-P1.1
3	AC IN (L)				
4	+DC OUT	Terminal:			
5	-DC OUT	M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			

Connector Pin (CN1)						
	Brands	Cherno	g Weei	JS	ST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal	
C1	-5V SB					
C2	+5V SB					
C3	GND					
C4	DC-OK	PHD-H20-	PHD-H20-	PHD-T20	PHDR-	SPHD-001T-
C5	-RC	2X4P		08VS	P0.5	
C6	+RC					
C7	-S					
C8	+S					

Connector Pin (FAN) (Note 4)						
Brands Alex JST						
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal	
F1	+12V	8821-2	8820T	XHP-2	SXH-002T-	
F2	GND				P0.6	

### **ASSEMBLY INSTRUCTIONS**

\*U Case T=1.5mm Customer is advised to screw into the threads no more than 1.5mm



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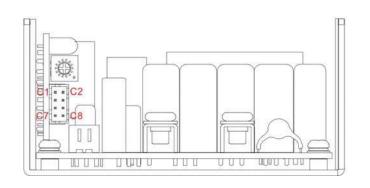
### **FUNCTION DESCRIPITON of CN1**

Pin No.	Function	Description
C1	-5VSB	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C2	+5VSB	Stand by voltage output ground 4.1~5.5V, referenced to pin C1(-5VSB).  The maximum load current is 1A with Fan, 0.4A without Fan
C3	GND	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C4	DC OK	DC-OK Signal is a DC output, referenced to pin C3(DC-OK GND).
C5	-RC	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C6	+RC	Turns the output on and off by electrical or dry contact between pin C5 (-RC), Short: Power OFF, Open: Power ON. The input voltage must be less than 1V in order to disable VOUT and greater than 3.3V (up to 5V) to enable it.
C7	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect.
C8	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect.

### **FUNCTION MANUAL & APPLICATION NOTE**

## 1. DC-OK Signal

Between DC-OK and GND	Output Status
3.7~6V	ON
0~1V	OFF

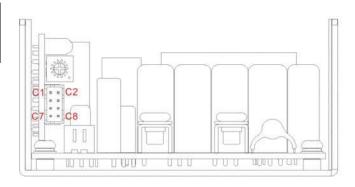


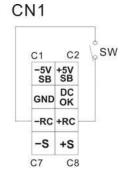
## CN1 C2 C1 -5V +5V SB SB GND DC -RC +RC -S +S C7 C8

## 2. Remote Control

It can be turned ON/OFF by using the "Remote Control" function.

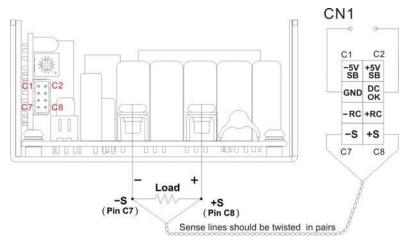
Between +RC and -RC	Output Status
SW ON (Short)	OFF
SW OFF (Open)	ON





### 2. +S and -S Sense

Shorter wiring to each unit is recommended, as well as twisting +S and -S in pairs, as shown below



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**ARF500E SERIES** 

# 500 Watts

## **KEY FEATURES**

- Universal Input 90-264Vac
- High Efficiency up to 91.5%
- Safety Approval to UL / IEC / EN 62368-1
- -30°C to +70°C Wide Range Operation Temperature
- Operating Altitude 5000M
- Active PFC Function
- I/O Isolation 4000VAC
- Standby 5V@1A
- 3-Year Product Warranty





## **ELECTRICAL SPECIFICATIONS**

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Model No.	ons valid at normal input voltage, i		ARF500E-12S	ARF500E-24S	ARF500E-48S	
Max Output Wa	attage (W)		500 W			
	Voltage	(Note 3)	90-264 VAC or 127-370 VDC			
	Frequency (Hz)		47-63 Hz			
Innut	Current (Full load)		<6.3 A max. (115 VAC) / <3.15 A max. (230 VAC)			
Input	Inrush Current (<2ms) (Clod Start)		< 40 A max. (115 VAC) / < 80 A max. (230 VAC)			
	Leakage Current		< 0.1mA / 264 VAC (Touch	Current)		
	Power Factor (at 230 VAC)		PF>0.94 at Full Load			
	Voltage (V.DC.)		12V	24V	48V	
	Voltage Adj Range (V.DC.)		±5% Output Voltage			
	Voltage Accuracy		±2%			
	Current (A) (max.)		41.5	20.8	10.41	
	Line Regulation (100-264 VAC)		±1%			
Output	Load Regulation (10-100%) (typ.)		±1%	±1%		
	Minimum Load		1%			
	Maximum Capacitive Load		5,000μF	2,500μF	1,250μF	
	Ripple & Noise (typ.)	(Note 1)	160mV	240mV	480mV	
	Efficiency (at 230VAC)		90%	90.5%	91.5%	
	Hold-up Time (at 115 VAC)	(Note 2)	8 ms min.			
	Over Power Protection		Auto recovery			
	Over Voltage Protection		Auto recovery			
Protection	Over Temperature Protection		Auto recovery			
	Chart Circuit Dustantian		Protection level 1 (nominal) : Continuous, Auto recovery			
	Short Circuit Protection		Protection level 2 (instantaneous high current): Latch			
	Input-Output	(Note 5)	4000VAC or 5656VDC			
Isolation	Input-PE	(Note 5)	2000VAC or 2828VDC			
	Output-PE	(Note 5)	1500VAC or 2121VDC			
	Operating Temperature		-30°C+70°C (with derating)			
	Storage Temperature		-30°C+85°C			
	Towns and the Confficient		±0.03%/°C ( 0~50°C )			
	Temperature Coefficient		±0.06%/°C ( -30~0°C )			
Environment	Altitude During Operation		5000m			
	Humidity		95% RH			
	MTBF		>160,000 h @ 25°C (MIL-HDBK-217F)			
	Vibration		IEC60068-2-6 (10~500Hz,	2G 10min./1cycle, 60min. e	ach along X, Y, Z axes)	
	Shock		IEC60068-2-27			

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A 30cm twisted pair of no.18 AWG copper wire is connected to a 47uF and 0.1uF capacitor of proper polarity and voltage rating. The oscilloscope probe ground led should connect right to the

The oscilloscope bandwidth should be at 20MHz and connected

ground ring of the probe and be as short as possible.



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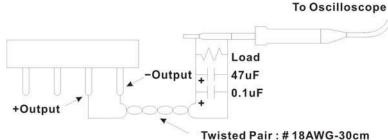
### **ELECTRICAL SPECIFICATIONS**

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Model No.		ARF500E-12S	ARF500E-24S	ARF500E-48S	
Discolored	Dimensions (L x W x H)	5.12 x 3.27 x 2.45 Inches	( 130.0 x 83.0 x 62.3 mm	) Tolerance ±0.5 mm	
Physical Weight		710 g			
Safety	Approval	UL 60950-1, UL / IEC / EN 62368-1			
Parameter	Standards & Level		Perforn	nance	
ГМ	Conducted	EN55032	Class E	3	
EMI	Radiated	EN55032	Class A	Class A	
	EN 55035		Α	A	
	ESD	IEC 61000-4-2 Air ± 8KV , (	Contact ± 4KV A		
	RS	IEC 61000-4-3 3V/m	А		
	EFT/B	IEC 61000-4-4 ± 1KV	Α	A	
EMS	Surge	IEC 61000-4-5 ± 1KV	Α		
	CS	IEC 61000-4-6 3Vrms	А		
	PFMF	IEC 61000-4-8 1A/m	А		
	Dips	IEC 61000-4-11 70% 500m	s B	В	
	Interruptions	IEC 61000-4-11 <5% 5000r	ns B		

### NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with ceramic 0.1uF & chemi-con KY 47uF parallel capacitor.



to AC ground.

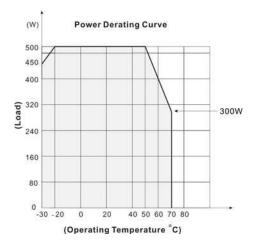
- 2. Hold-up Time measured at 90% Vout.
- 3. Please check the derating curve for more details.
- 4. Fan output voltage will be between 10.2~13.3V, when the main output is greater than 3% of the max. load, and fan's terminal block output current is higher than 0.1A (min.)
- 5. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors from Arch power supply.
- 6. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

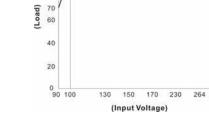
(ATTENTION: 2 poles avec fusible sur le neutre. Deconnecter le secteur avant intervention.)



ARF500E SERIES 500 Watts

## **DERATING**





100

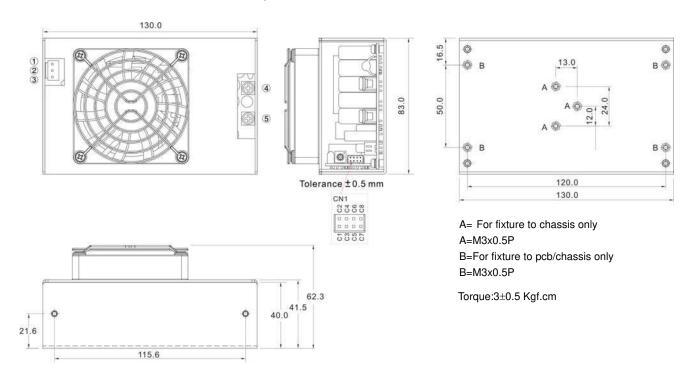
Ta≈25°C

If input voltage is lower than 100VAC, please refer to the output derating V.S. input voltage curve for details



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# MECHANICAL DIMENSIONS (Top View)



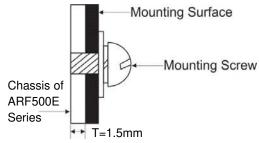
В	rands	Alex JST		ST			
PIN#	Single	Mating Terminal		Mating Housing	Terminal		
A,B	PE	_	_	_	_		
1	AC IN (N)						
2	NO PIN	9396-3	96T series	VHR-3N	SVH-41T-P1.1		
3	AC IN (L)						
4	+DC OUT	Terminal:					
5	-DC OUT		M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.				

Connector Pin (CN1)							
	Brands	Cherng Weei		JST			
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal		
C1	-5V SB						
C2	+5V SB						
C3	GND						
C4	DC-OK	PHD-H20-	PHD-H20-	PHD-H20-	PHD-T20	PHDR-	SPHD-001T-
C5	-RC	2X4P		08VS	P0.5		
C6	+RC						
C7	-Ş						
C8	+S						

Connector Pin (FAN) (Note 4)							
Brands		Alex		JST			
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal		
F1	+12V	8821-2	8820T	XHP-2	SXH-002T-		
F2	GND				P0.6		

### **ASSEMBLY INSTRUCTIONS**

\*U Case T=1.5mm Customer is advised to screw into the threads no more than 1.5mm



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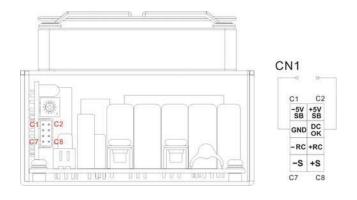
## **FUNCTION DESCRIPITON of CN1**

Pin No.	Function	Description
C1	-5VSB	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C2	+5VSB	Stand by voltage output ground 4.1~5.5V, referenced to pin C1(-5VSB).  The maximum load current is 1A with Fan
C3	GND	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C4	DC OK	DC-OK Signal is a DC output, referenced to pin C3(DC-OK GND).
C5	-RC	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C6	+RC	Turns the output on and off by electrical or dry contact between pin C5 (-RC), Short: Power OFF, Open: Power ON. The input voltage must be less than 1V in order to disable VOUT and greater than 3.3V (up to 5V) to enable it.
C7	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect.
C8	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect.

### **FUNCTION MANUAL & APPLICATION NOTE**

## 1. DC-OK Signal

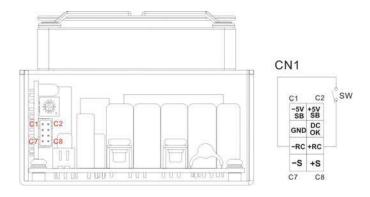
Between DC-OK and GND	Output Status
3.7~6V	ON
0~1V	OFF



## 2. Remote Control

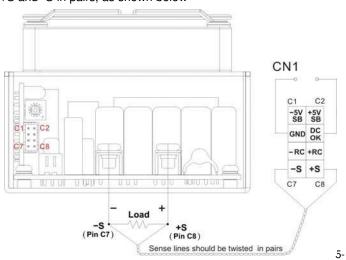
It can be turned ON/OFF by using the "Remote Control" function.

Between +RC and -RC	Output Status
SW ON (Short)	OFF
SW OFF (Open)	ON



## 2. +S and -S Sense

Shorter wiring to each unit is recommended, as well as twisting +S and -S in pairs, as shown below



http://www.archcorp.com.tw

TEL: +886-2-26989508 FAX: +886-2-26981319