



全漢企業股份有限公司  
FSP TECHNOLOGY INC.

# SPECIFICATION

MODEL : FSP700-1UAC01

REVISION : 02

DRAFT

R/D	CHECKED	APPROVED
Brian		



# Electrical Specification

## History

Rev.	Description	Date	Author
01	SPEC ISSUE	20200201	brian
02	Modify : Efficiency Constant Current mode Weight	20200620	Johnny



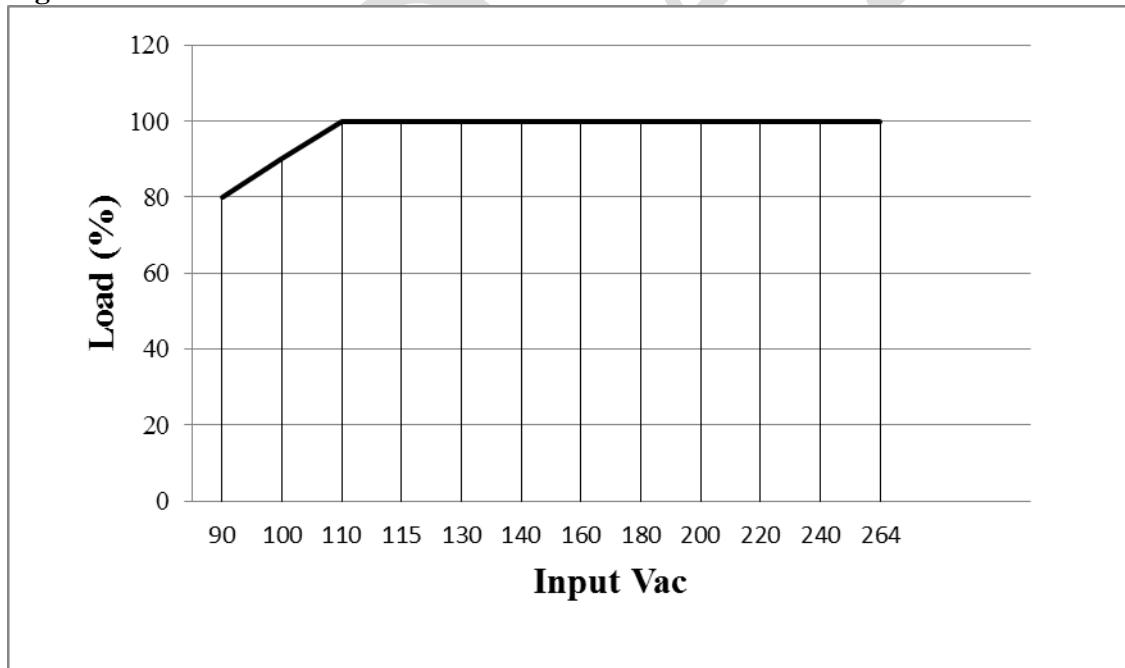
# Electrical Specification

## Electrical Requirements

### 1. Input :

ITEM	CONDITION	SPECIFICATION
1.1 Rated Input Voltage	Refer Figure1-1	100Vac - 240Vac
1.2 Input Voltage Range	Continuously	90Vac to 264Vac to derate from 90Vac please refer figure 1-1
1.3 Input Frequency Range	Continuously	47Hz to 63Hz
1.4 Efficiency	230Vac, 50Hz @typical 115Vac, 60Hz @typical	≥ 93% ≥ 91%
1.5 Inrush Current	230Vac	Should be less than rating of critical components < 100A
1.6 Power Factor	230Vac 115Vac	≥ 0.90

**Figure 1-1**



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## 2. Output :

※Measured at the output connector.

ITEM	CONDITION	SPECIFICATION
2.1 Charging Voltage	58.8V±1%	
2.2 Output Voltage Ripple and Noise	0.1uF/100V Ceramic Cap. and 47uF electrolytic Cap. Paralleled between the output connector, BW=20M Hz	≤ 500mVp-p
2.3 Pre-Charge Current mode	Pre-Charge Voltage 30V~ 42V	3A ± 0.1A
2.4 Constant Current mode	Pre-Charge Voltage 43V~ 57V	12A ± 0.1A *refer figure 2-1
2.5 Constant Voltage mode	Full Charge Voltage	58.8V ± 1% *refer figure 2-1
2.6 Full Charge Switch Off	Terminate Charge (2.5 %) (TBD.)	0.5A ± 0.1A
2.7 Reverse Current	Current from battery into Charger when AC Power Off	< 0.5mA
2.8 Battery Voltage for Charger	Charger Wake Up	≥ 30V
2.9 Charge I V Curve	TBD. Presetting as below IV curve	TDB Control by CAN
2.10 Interlock (Enable)	Enable charger, (control cable)	1. Connect to GND -- Fixed Charge profile 2. Open— Charge profile control by CAN
2.11 LED indicator	N/A	N/A
2.12 CAN_H	CAN BUS (OPTION) (control cable)	
2.13 CAN_L	CAN BUS (OPTION) (control cable)	

### Output Cable Pin define:



Pin Number	Pin Define
1	CANH
2	CANL
3	GND
4	Interlock

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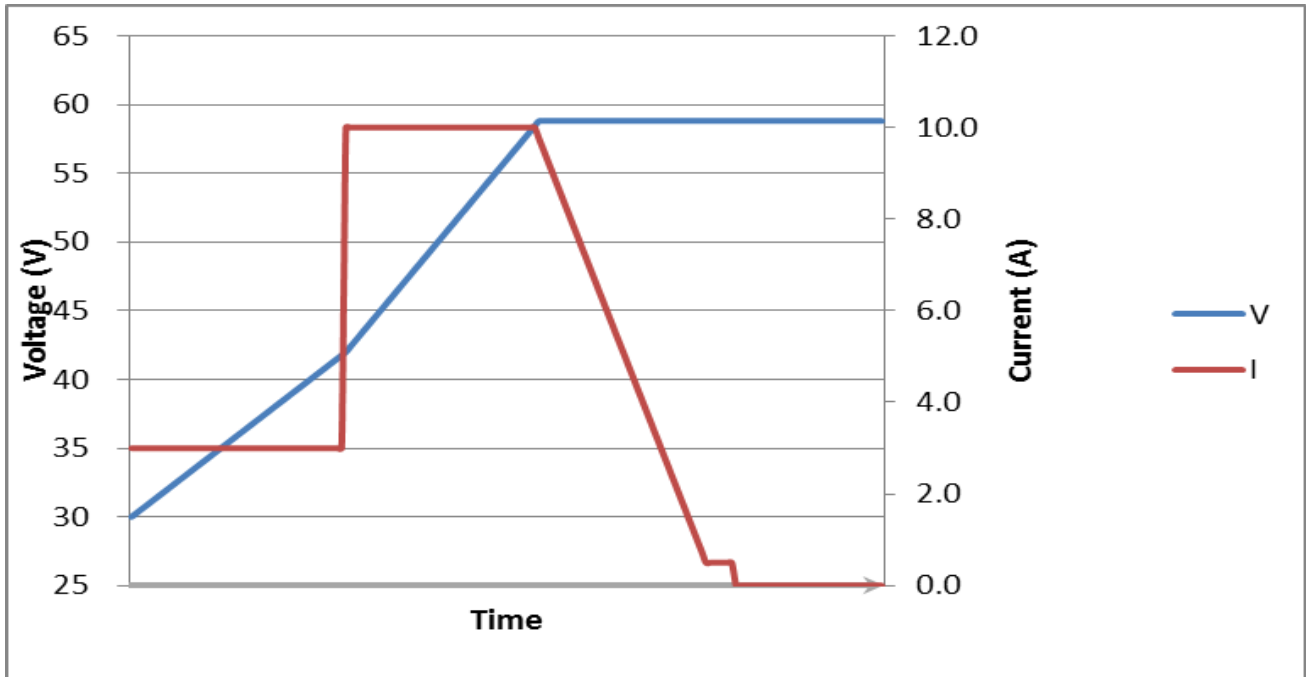
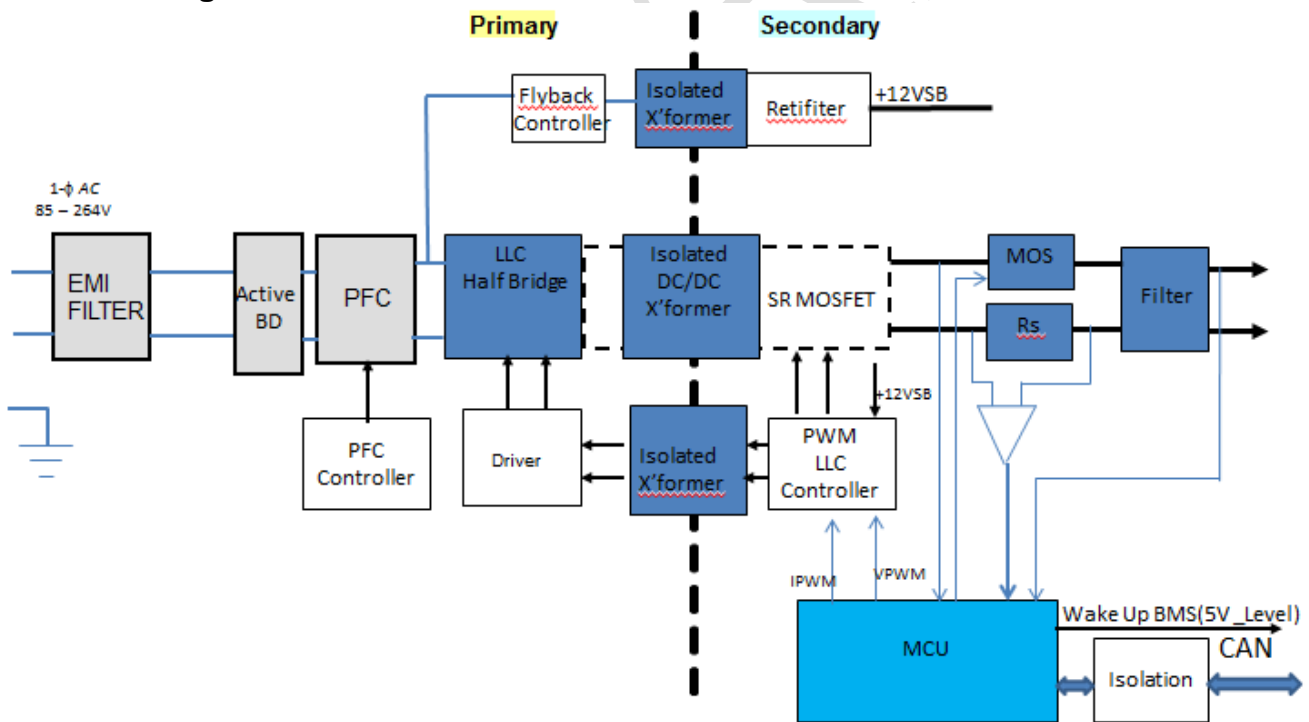


Figure 2-1

## 2-1 Block diagram





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## 3. Protection:

ITEM	CONDITION	SPECIFICATION
3.1 Short Circuit Protection	When an internal fault occurs, or an external fault (overload or short circuit) is applied to the power supply, the power supply shall shut down and enter auto-recovery mode	Auto-recovery and no damage, No fire, no smoke, no safety issue.
3.2 Over Voltage Protection	$OVP1 \geq 60V$	Latch and no damage
3.3 Maximum Charge time Protection	Can be modified by customized.	By CAN (TBD)
3.4 Secondary Side over current	$\geq 13A$	Latch and no damage
3.5 Thermal Protection	The power supply will shut down during over temperature condition and returns back to normal operation when the power supply is cooled down and require remove the AC mains input to reset the system	Latch and no damage

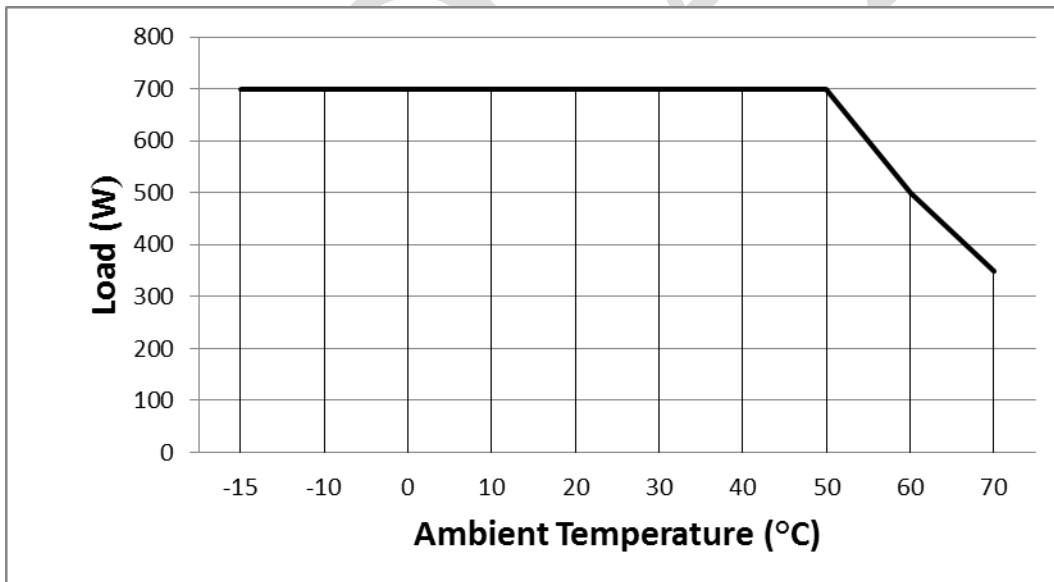


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## 4. Environment :

ITEM	CONDITION	SPECIFICATION
4.1 Cooling	Convection cooling	
4.2 Temperature	Operating	-15°C to +50°C *refer figure 3-1
	Storage	-40°C to +85°C
4.3 Relative Humidity	Operating	30% ~ 75%(non-condensing)
	Storage	5% ~ 95%(non-condensing)
4.4 Vibration	ISO 16750-3 (4-1,4-2,4-3)	Normal operation shall be continued
4.12 MTBF	At maximum load and +25°C ambient, SR-332	> 50000 hours

**Figure 3-1**





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## 5. Safety & EMC :

ITEM	CONDITION	SPECIFICATION
5.1 Safety Standard	ISO13063 UL2202 IEC62368, IEC60335, UL1564 ISO 6469-3, ISO 17409, CAS107.2	Need to Confirm the Standard and impact issues.
5.2 EMC emissions	R10, FCC part15B EN55011 EN55014	
5.3 EMC immunity	EN61000-4- 2/3/4/5/6 EN61000-6-2 EN61000-6-4 EN61000-3-3	
5.4 Harmonic	EN61000-3-2 CLASS A	

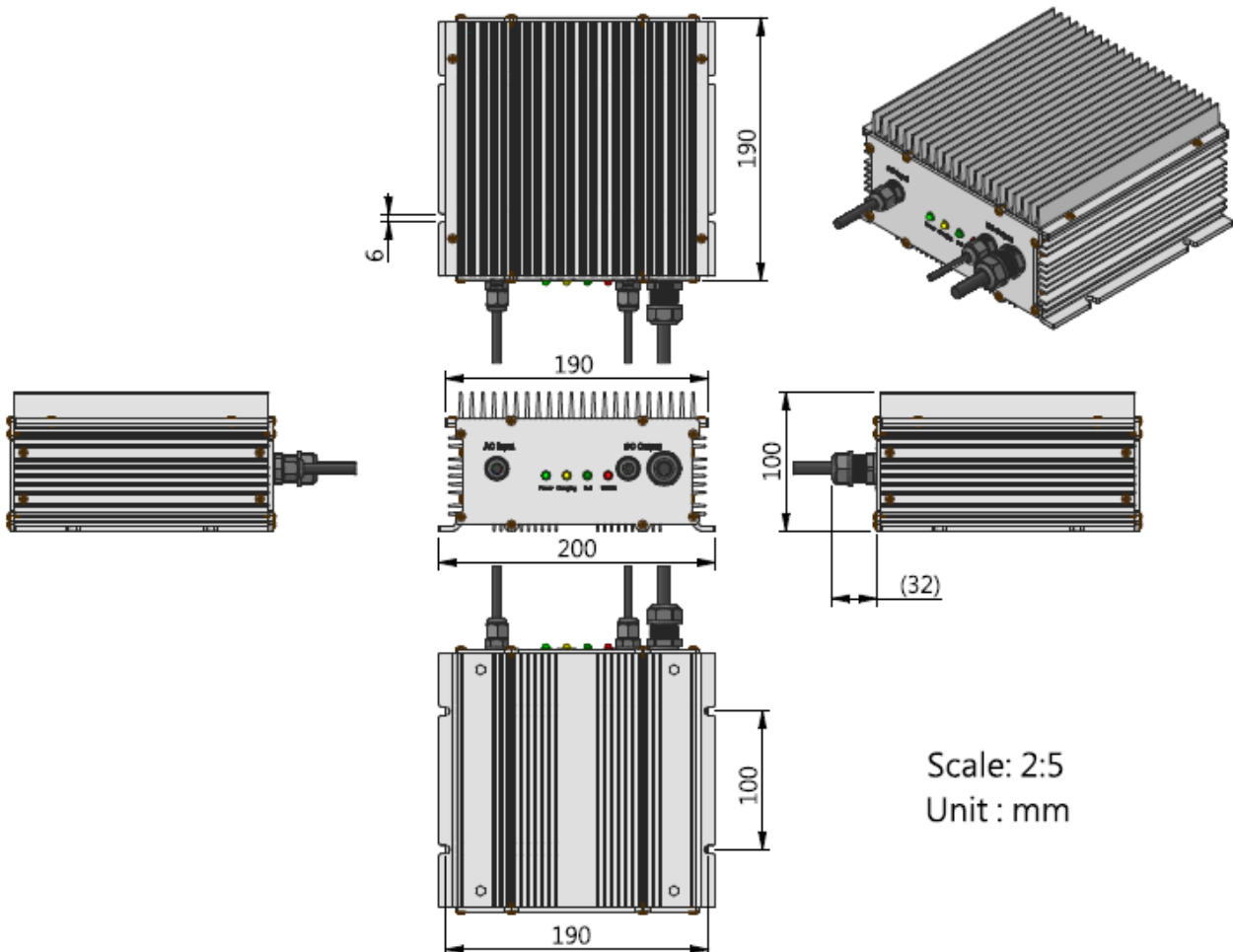


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## 6. Mechanical :

ITEM	CONDITION	SPECIFICATION
6.1 Dimension (Length x Width x Height)	200mm * 190 mm * 100mm	
6.2 Weight		≤ 5Kg (TBD)
6.3 Input CABLE	Connector P1 , AC input	16AWG
6.4 Output CABLE	Connector P2, P3 , Output	Vout cable 14AWG X 2 Control cable/28AWG
6.5 Protection class	IP67	

## DRAWING:



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## 7. CAN Communication:

### General CAN Settings

- . Identifier length     **11 Bits   Standard format**
- . Byte Order           **Little Endian (LSB has lower address)**
- . Data Rate            **500 kbit/s**
- . Bit Timing            **According to ISO16575**

Baud Rate	500kbs
Time Quanta (TQ)	100ns
Bit time	2000ns
Reserved-TBD.	3
Reserved	4
Charger Relay	5
Reserved	5
Charge Finished	5
Battery Error	5
Message counter	6-7

- a. The CHARGER is connected AC power and power up, interlock is ok.
- b. BMS start to sent cyclic message in each 250ms  
**(140h , BMS to charger message)**
- c. Base on 210h message, charger should response the message  
(500h charger to BMS message)  
(510h charger to BMS data)
- d. If the BMS doesn't provide cyclic message within 5 sec , the charge will enter **Communication Error Time out**, and stop charge.
- e. If the charger doesn't response cyclic message within 250ms , the charge will enter **Charger Time out**, and stop charge.
- f. **Key message of 140h**  
Charger Current request (byte 0, byte 1)  
Charger Voltage request (byte 2, byte 3)  
Charger Relay Control (byte 5, bit1 / bit0)  
Storage Charge Request( byte4,bit2/bit3)  
Battery Error (byte5, bit6/bit7)

Data	Byte	bit	value	unit	Resolution	Remark
Charger Current	0	0-8	0-30	A	0.5	
Charger Voltage	1-2	0-16	0-60	V	0.1	

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Reserved-TBD.	3					Offset Voltage
Reserved	4					
Charger Relay	5	0-1	0-3	1	1	00: OFF(Relay Open) 01: ON (Relay Close) 10: N/A 11: N/A
Reserved	5	2-3				
Charge Finished	5	4-5	0-3	1	1	00: Charge not finished 01: Charge finished 10: N/A 11: N/A
Battery Error	5	6-7	0-3	1	1	00: no error 01: BMS Error 10: N/A 11: N/A
Message counter	6-7	0-15	0-65535			

**g. Key message of 500h**

Actual Charger Current (byte 0, byte 1)

Actual Charger Voltage (byte 2, byte 3)

Storage Charge Status (byte 6, bit1 / bit0)

Data	Byte	bit	value	unit	Resolution	Remark
Charger Current	0-1	0-15	0-15	A	0.01	
Charger Current	2-3	0-15	0-60	V	0.01	
Storage Charge Status	4	0-1	0-3	1	1	00: No Active 01: Charge to 30% SOC 10: N/A 11: N/A
Charger_Temperature_Warning	4	2-3	0-3	1	1	Warning flag 00: Normal 01: Over temp 10: N/A 11: N/A
Reserved	4	4-7				
Reserved	5					
Message counter	6-7	0-15	0-65535			

**h. Key message of 510h**

Charger serial number (byte 0, byte 1,byte 3)

Charger Error code (byte 3,byte4)

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Data	Byte	bit	value	unit	Resulation	Remark
Error Code	0-1	0-16	0-FFFFFF	1	1	TBD
Charger_Tempera ture	2	0-8	-15 ~ 240	°C	1	
Serial Number	3-5					TBD
Reserved	6-7					

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## 8. LED indicator:

AC Power OK	AC IN The Power LED turn on.
Wake-up Battery	The orange LED flashes every 1s.
Charging	The orange LED turn on.
Charging finished	The green LED turn on.
Charger errors	The red LED turn on. 1. Charge cycle is not finish 2. Can't not enter charge mode