

Dimension

L	*	W	*	H
330	*	140	*	41 (1U) mm
13	*	5.5	*	1.61 (1U) inch



User's Manual



Video



Features

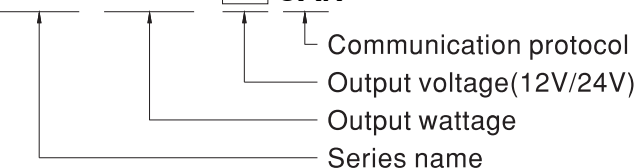
- 1U low profile design.
- Universal AC Input/Inverting Output
- Full digital design with 93% conversion efficiency for both AC/DC and DC/AC conversion.
- Ultrafast switching time between AC/DC and DC/AC of 1ms.
- Design refer to CB/TUV/UL 62368-1 and IEC 62477 regulation.
- Active current sharing up to 11000W(4+1).
- <3.5% Low THDi in both conversion mode.
- Force charging and discharging mode with CANBus command.
- Complete protections: Anti-islanding protection, AC fail protection, DC OVP, OLP, OCP, OTP.
- 5 years warranty

Description

The BIC-2200U is a 2.2KW bidirectional power supply with energy recycle function, and is designed to operate from universal AC range of 110~305VAC with derating at low-line AC voltages. It is fully digital and 1U height designed. It is designed to control the power transferred from AC grid to DC and DC to AC grid for energy recycle. The implementation of a bidirectional power supply of the BIC-2200U allows battery manufacturers to charge the battery from AC grid and recycle the DC energy back into AC grid in one single unit. With built-in functions such as active current sharing, remote ON/OFF control and CANBus model available, the BIC-2200U provides vast design flexibility for battery formation & test equipment, V2G (Vehicle-to-grid) system, charging station, laser system and kinetic recovery system.

Model Encoding / Order Information

BIC - 2200U - 12 CAN



Applications

- Battery cell formation & grading
- V2G (Vehicle-to-grid) system
- Marine battery charger module
- Electric scooter or vehicle charger station
- Kinetic energy recovery system
- Electrolysis system
- Wastewater treatment system

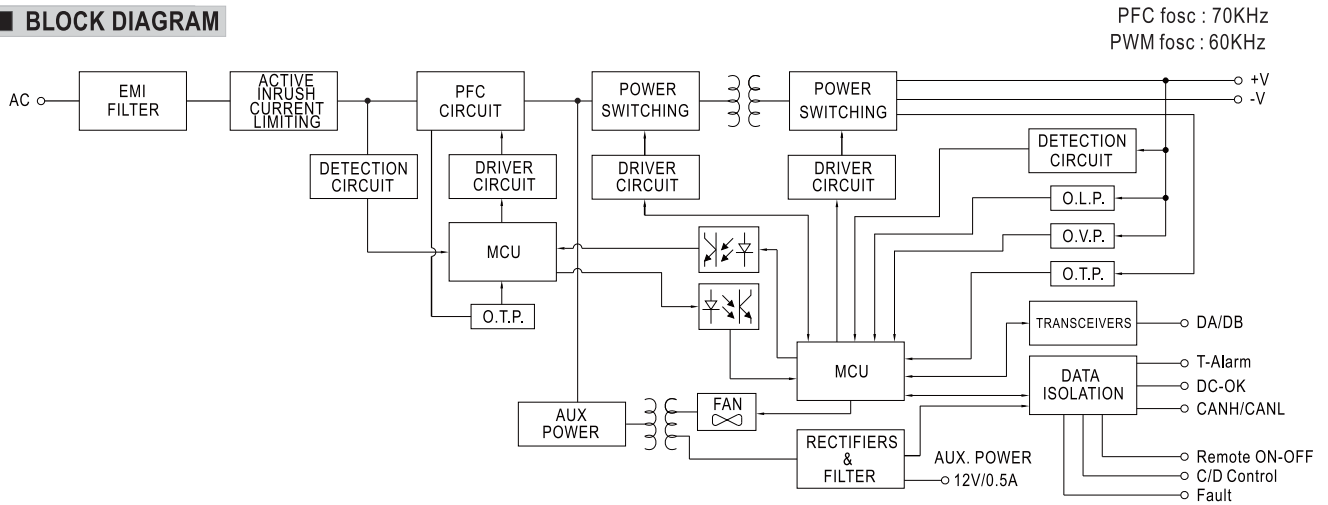
GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

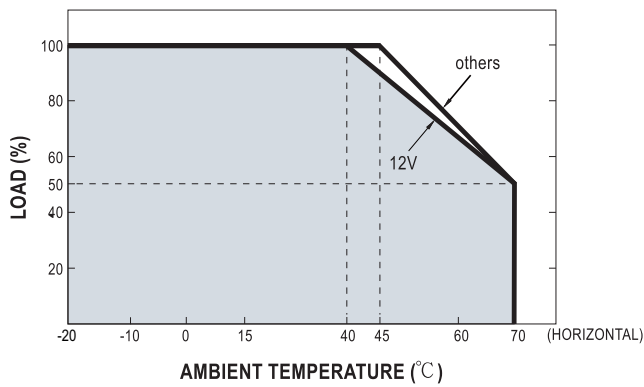
SPECIFICATION

MODEL		BIC-2200U-12CAN		BIC-2200U-24CAN			
AC to DC Direction	OUTPUT	DC VOLTAGE		12V			
		RATED CURRENT		180A			
		RATED POWER (max.)		2160W (180~305VAC)			
				1500W (110~120VAC)			
		FULL POWER VOLTAGE RANGE		12 ~ 15V			
				24 ~ 28V			
		RIPPLE & NOISE (max.) Note.2		190mVp-p			
				310mVp-p			
		VOLTAGE ADJ. RANGE		10 ~ 15V			
				19 ~ 28V			
	INPUT	CURRENT RANGE		0 ~ 180A			
				0 ~ 90A			
		VOLTAGE TOLERANCE Note.3		± 1.0%			
				± 1.0%			
		LINE REGULATION		± 0.5%			
				± 0.5%			
		LOAD REGULATION		± 0.5%			
				± 0.5%			
SETUP, RISE TIME		1800ms, 60ms/230VAC at full load					
INPUT	AC VOLTAGE RANGE		110 ~ 305VAC				
	FREQUENCY RANGE		47 ~ 63Hz				
	POWER FACTOR (Typ.)		0.98/230VAC at full load 0.98/277VAC at full load				
	EFFICIENCY (Typ.) Note.5		90%				
			93%				
	AC CURRENT (Typ.)		9A/277VAC 11A/230VAC 13A/115VAC				
	INRUSH CURRENT (Typ.)		COLD START 35A/230VAC				
	LEAKAGE CURRENT		<2mA/230VAC				
DC to AC Direction	INPUT (Note.4)	TOTAL HARMONIC DISTORTION		<3.5%(@load=100%/230VAC)			
		RATED INPUT POWER (max.)		1800W(230VAC)/1500W(115VAC)			
		FULL POWER VOLTAGE RANGE		12 ~ 15V			
				24 ~ 28V			
		DC VOLTAGE RANGE		10 ~15V			
				19 ~ 28V			
		MAX. INPUT CURRENT		153A(230VAC)/120A(115VAC)			
				177A(230VAC)/62.5A(115VAC)			
	OUTPUT	RATED OUTPUT POWER (Typ.) (@180-305V)		1685W			
				1720W			
		RATED OUTPUT POWER (Typ.) (@110-120V)		1280W			
				1370W			
		VOLTAGE RANGE		110 ~ 305 VAC determined by AC main			
		FREQUENCY RANGE		47 ~ 63Hz determined by AC main			
		AC CURRENT (Typ.)		6.5A/277VAC 7.5A/230VAC 12.5A/115VAC			
		POWER FACTOR (Typ.)		0.99/230VAC at full load 0.98/277VAC at full load			
		EFFICIENCY (Typ.) Note.5		90.5%			
				92.5%			
TOTAL HARMONIC DISTORTION		<3.5%(@load=100%/230VAC)					
PROTECTION	OVER LOAD	105 ~ 115% rated output power					
		AC to DC		Constant current limiting, shut down DC O/P voltage 5 sec. after DC O/P voltage is down low, re-power on to recover			
		DC to AC		Not accurate with constant power design			
	SHORT CIRCUIT		Shut down O/P current, re-power on to recover				
			17.6 ~ 20.8V		33.6 ~ 39.2V		
	OVER VOLTAGE		Protection type : Shut down O/P voltage, re-power on to recover				
OVER TEMPERATURE		Shut down O/P voltage, recovers automatically after temperature goes down					
FUNCTION	ISLANDING PROTECTION		Shut down AC O/P voltage, re-power on to recover				
	REMOTE ON-OFF CONTROL		By electrical signal or dry contact Short: Power ON Open: Power OFF Please refer to the Function Manual infollowing				
	BIDIRECTION SWITCH TIME (Typ.)		1ms				
	ALARM SIGNAL		Isolated TTL signal output for T-Alarm, DC-OK and Fault. Please refer to the Function Manual in following pages				
	AUXILIARY POWER		12V@0.5A tolerance ± 5%, ripple 150mVp-p				
	BATTERY MODE RATED CURRENT(default) Note.7	AC to DC		160A/230VAC/277VAC		80A/230VAC/277VAC	
				120A/115VAC		62.5A/115VAC	
DC to AC		120A/230VAC/277VAC		64A/230VAC/277VAC			
		120A/115VAC		62.5A/115VAC			
ENVIRONMENT	WORKING TEMP.		-20 ~ +70°C (Refer to "Derating Curve")				
	WORKING HUMIDITY		20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY		-40 ~ +85°C, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT		± 0.03%/°C (0 ~ 45°C)				
SAFETY	VIBRATION		10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y Z axes				
	SAFETY STANDARDS		Design refer to UL62368-1, CAN/CSA C22.2 No.62368-1				
	WITHSTAND VOLTAGE Note.8		I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:500VAC				
OTHERS	ISOLATION RESISTANCE Note.8		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH				
	MTBF		462.9K hrs min. Telcordia SR-332 (Bellcore) ; 46K hrs min. MIL-HDBK-217F (25°C)				
	DIMENSION		330*140*41mm (L*W*H)				
	PACKING		2.9Kg; 4pcs/12.6Kg/1.25CUFT				
NOTE		1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. As a constant power output, the driver will auto derating the current limitation when voltage raise above rated voltage(12V,24V) in order to remain 1800W output. On the other hand, when voltage is below rated voltage(12V,24V), the maximum current limitation will set at Max input current. 5. The efficiency is measured at 75% load. 6. The ambient temperature derating of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft) 7. CANBus model only. Can be adjusted by CANBus communication. Default values are set for 230VAC/277VAC operation. For 115VAC, the current is limited by maximum input/output power levels by firmware. 8. During withstand voltage and isolation resistance testing, the screw "A" shall be temporarily removed, and shall be installed back after the testing.* 9. 48V Model available by request					
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx							

■ BLOCK DIAGRAM



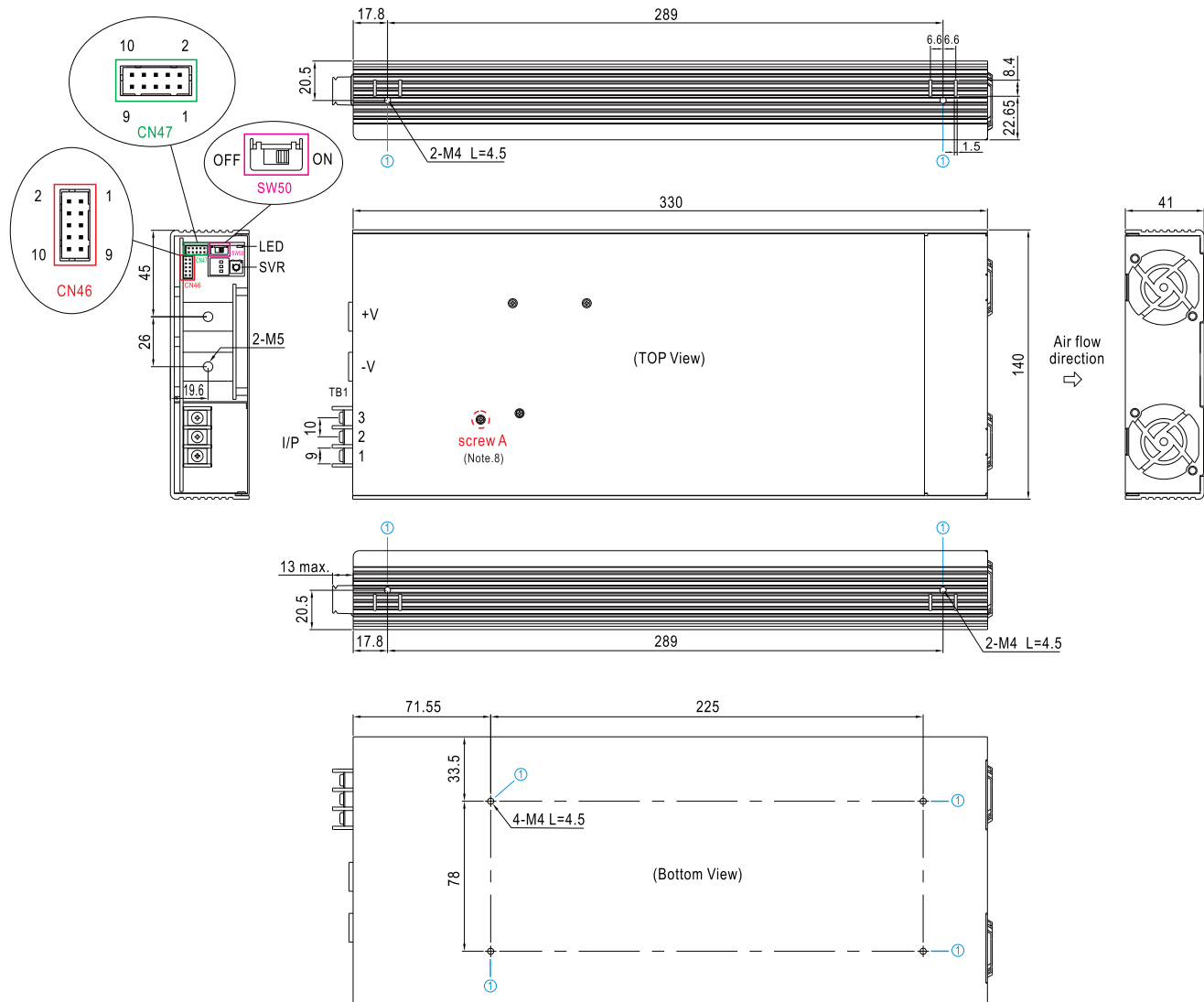
■ DERATING CURVE



MECHANICAL SPECIFICATION

Case No. 277C

Unit:mm



AC Input Terminal(TB1) Pin NO. Assignment

Pin No.	Assignment	Terminal	Max mounting torque
1	AC/L	DECA T35-EO32-03	18Kgf-cm
2	AC/N		
3	FG ≐		

※DC Output Terminal Pin No. Assignment

Assignment	Diagram	Maximum mounting torque
+V, -V		10Kgf-cm

※ LED Status Indicators

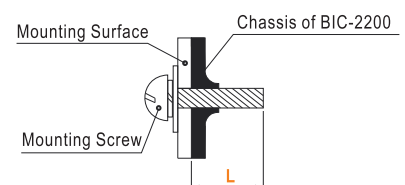
LED	Description
	Green AC to DC Direction, functions as regular power supply.
	Green DC to AC Direction, functions as grid inverter.
	Red Abnormal status (Over temperature protection, Overload protection, Fan fail.)

● Light

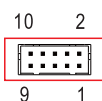
⚡ Flash

※ Mounting Instruction

Hole No.	Recommended Screw Size	MAX. Penetration Depth L	Recommended mounting torque
①	M4	4.5mm	7~10Kgf-cm



※Control Pin No. Assignment(CN46) : HRS DF11-10DP-2DS or equivalent



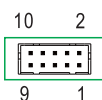
Mating Housing	HRS DF11-10DS or equivalent
Terminal	HRS DF11-10SC or equivalent

Pin No.	Function	Description
1	+12V-AUX	Auxiliary voltage output, 11.4~12.6V, referenced to GND-AUX (pin 2,4). The maximum output current is 0.5A. This output is not controlled by the Remote ON/OFF control.
2,4	GND-AUX	Auxiliary voltage output GND. The signal return is isolated from the output terminals (+V & -V).
3	+5V-AUX	Auxiliary voltage output, 4.5~5.5V, referenced to GND-AUX (pin 2,4) only for Remote ON/OFF used. This output is not controlled by the Remote ON/OFF control.
5	Remote ON-OFF	The unit can turn the output ON/OFF by electrical signal or dry contact between Remote ON/OFF and +5V-AUX(pin 3). (Note.1)
6	C/D Control (Note.2)	High (4.5 ~ 5.5V) : Battery Charging mode Low (-0.5 ~ 0.5V) : Battery Discharging mode (Note.1)
7	DC-OK	High (4.5 ~ 5.5V) : When the Vout ≤ 80%±5%. Low (-0.5 ~ 0.5V) : When Vout ≥ 80%±5%. The maximum sourcing current is 4mA and only for output. (Note.1)
8	Fault	High (4.5 ~ 5.5V) : When the Vac ≤ 103Vrms OLP, SCP, OTP, OVP, AC Fail, fan lock, islanding protection. Low (-0.5 ~ 0.5V) : When Vac ≥ 107Vrms and when power supply work normally. The maximum sourcing current is 4mA and only for output. (Note.1)
9	T-ALARM	High (4.5 ~ 5.5V) : When the internal temperature exceeds the limit of temperature alarm, or when any of the fans fails. Low (-0.5 ~ 0.5V) : When the internal temperature is normal, and when fans work normally. The maximum sourcing current is 4mA and only for output(Note.1)
10	NC	-----

Note 1 : Isolated signal, referenced to GND-AUX.

Note 2 : CANBus model only.

※Control Pin No. Assignment(CN47) : HRS DF11-10DP-2DS or equivalent



Mating Housing	HRS DF11-10DS or equivalent
Terminal	HRS DF11-10SC or equivalent

Pin No.	Function	Description
1,2	DA	Differential digital signal for parallel control. (Note.1)
3,4	DB	
5,6	GND	Negative output voltage signal. Certain functionreference. It can not be connected directly to the load.
7	CANH	Data line used in CANBus interface. (Note.2)
8	CANL	Data line used in CANBus interface. (Note.2)
9,10	GND-AUX	Auxiliary voltage output GND. The signal return is isolated from the output terminals (+V & -V).

Note 1 : Non-isolated signal, referenced to GND.

Note 2 : Isolated signal, referenced to GND-AUX.

◎ Bidirection process

BIC-2200U possesses AC to DC and DC to AC two way conversion functions. The conversion direction can be automatically detected and controlled by BIC-2200U's internal firmware or manually switched by users according to different application requirements. Before entering detailed function explanation. Please refer to following definitions.

AC to DC (Energy absorbing and charging/ power supplying)

The BIC-2200U converts AC energy from the grid into DC energy for the battery or the loads. The operation principle is the same as an ordinary power supply or a charger.



DC to AC (Energy recycling and discharging):

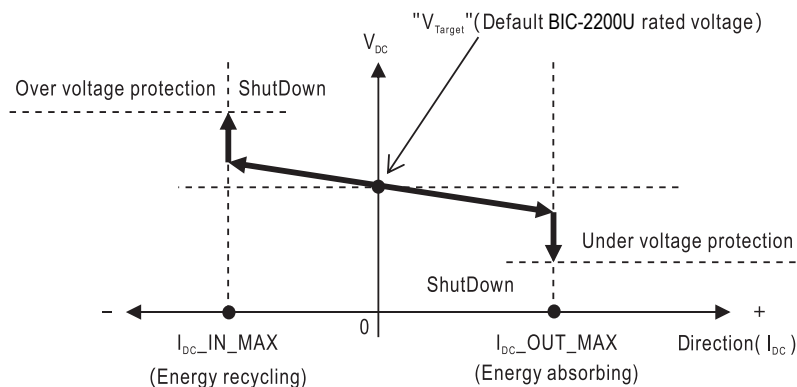
Opposite to the AC to DC conversion, the BIC-2200U converts DC energy from the battery or loads into AC energy, then feeding back to the grid. AC output synchronization range is 180Vac~264Vac/47Hz~63Hz, the bidirectional power supply can work normally as long as the AC grid is within the range.



Bi-direction auto-detect mode:

This is default factory setting, BIC-2200U operates as table below

Condition	Mode
Set voltage > load voltage	AC to DC
Set voltage < load voltage	DC to AC



Operating characteristic curve

Note: Detail of set voltage, please refer to user's manual.

Bi-direction battery mode:

This mode only can be activated by CANBus model. Set the BIC-2200U in AC to DC (charging) or DC to AC (discharging) conversion directly through command DIRECTION_CTRL below.

Command	Conversion
DIRECTION_CTRL = 00h	AC to DC (charging)
DIRECTION_CTRL = 01h	DC to AC (discharging)

◎ Current Sharing

BIC-2200U has the built-in active current sharing function and can be connected in parallel, up to 5 units, to provide higher output power as exhibited below:

※ The power supplies should be paralleled using short and large diameter wiring and then connected to the load.

※ In parallel connection, power supply with the highest output Voltage will be the master unit and its Vout will be the DC bus voltage.

※ The total output current must not exceed the value determined by the following equation:

Maximum output current at parallel operation = (Rated current per unit) × (Number of unit) × 0.95

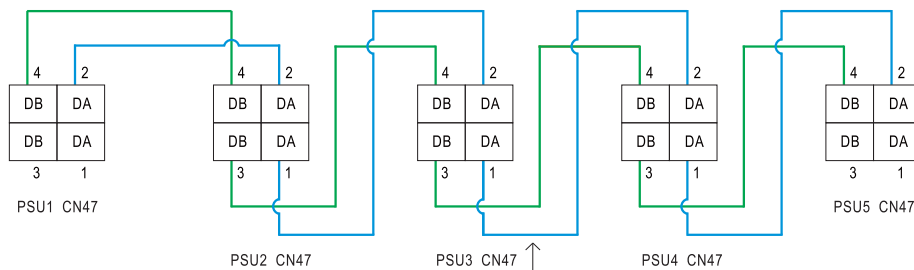
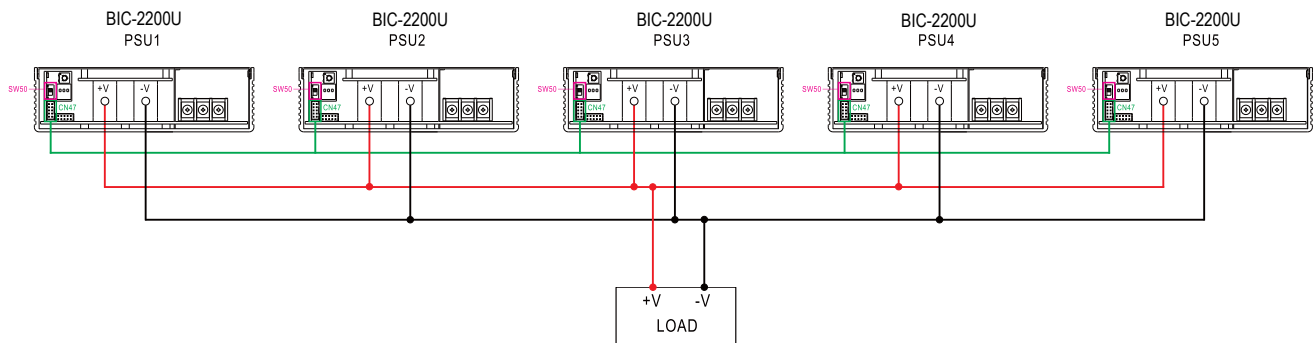
※ When the total output current is less than 5% of the total rated current, or say (5% of Rated current per unit) × (Number of unit) the current shared among units may not be balanced.

※ Under parallel operation ripple of the output voltage may be higher than the SPEC at light load condition. It will go back to normal ripple level once the output load is more than 5%.

※ CN47/SW50 Function pin connection

Parallel	PSU1		PSU2		PSU3		PSU4		PSU5	
	CN47	SW50	CN47	SW50	CN47	SW50	CN47	SW50	CN47	SW50
1 unit	X	ON	—	—	—	—	—	—	—	—
2 unit	V	ON	V	ON	—	—	—	—	—	—
3 unit	V	ON	V	OFF	V	ON	—	—	—	—
4 unit	V	ON	V	OFF	V	OFF	V	ON	—	—
5 unit	V	ON	V	OFF	V	OFF	V	OFF	V	ON

(V : CN47 connected ; X : CN47 not connected)



If the lines of CN47 are too long, they should be twisted in pairs to avoid the noise.

◎ DA, DB connected mutually in parallel.