

## Basic Characteristics Data

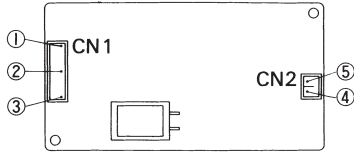
Model	Circuit method	Switching frequency [kHz]	Input current [A]	Fuse [A]	Inrush current protection circuit	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
LCA10S	Flyback converter	80 - 350	0.3	2	Resistance of line filter	CEM-3	Yes		*1	*1
LCA15S	Flyback converter	80 - 300	0.4	2	Thermistor	CEM-3	Yes		*1	*1
LCA30S	Flyback converter	80 - 400	0.7	3	Thermistor	CEM-3	Yes		*1	*1
LCA50S	Single ended forward method	200	1.3	3	Thermistor	CEM-3	Yes		Yes	*1
LCA75S	Single ended forward method	190	1.9	3	Thermistor	CEM-3	Yes		Yes	*1
LCA100S	Single ended forward method	160	2.5	5	Triac	CEM-3	Yes		Yes	*1
LCA150S	Single ended forward method	170	3.6	6.3	Triac	CEM-3	Yes		Yes	*1

- \*1 Please refer to Series/Parallel operation in the instruction manual.
- \* The value of input current shown is at ACIN 100V and rated load.
- \* Switching frequency of flyback converter depends on input voltage and load factor.

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# 1 Terminal Block

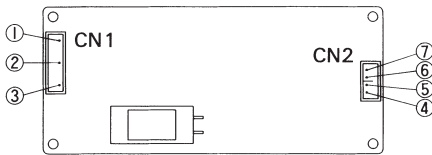
## ●LCA10S



- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④-Output
- ⑤+Output

## ●LCA15S

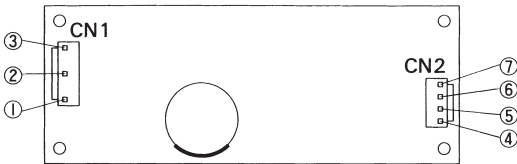


- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④-Output
- ⑤-Output
- ⑥+Output
- ⑦+Output

LCA

## ●LCA30S



- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④+Output
- ⑤+Output
- ⑥-Output
- ⑦-Output

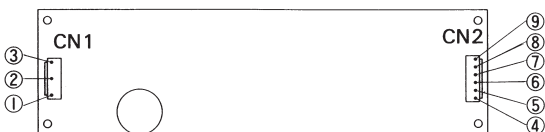
## ●LCA50S



- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④+Output
- ⑤+Output
- ⑥-Output
- ⑦-Output

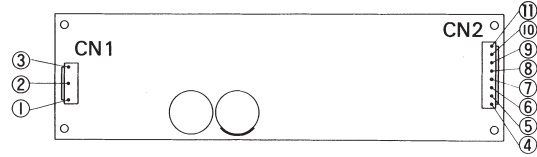
## ●LCA75S



- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④+Output
- ⑤+Output
- ⑥+Output
- ⑦-Output
- ⑧-Output
- ⑨-Output

## ●LCA100S

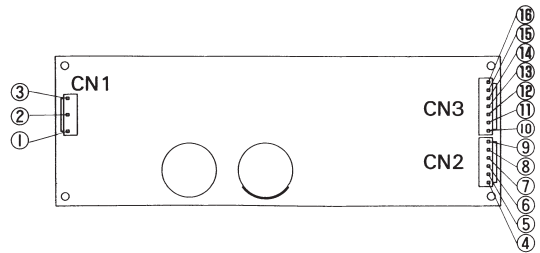


- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④+Output
- ⑤+Output
- ⑥+Output
- ⑦+Output

- ⑧-Output
- ⑨-Output
- ⑩-Output
- ⑪-Output

## ●LCA150S



- ①AC(L)
- ②AC(N)
- ③Frame ground

- ④ - ⑨+Output
- ⑩ - ⑬-Output

# 2 Function

## 2.1 Input voltage range

- The range is from AC85V to AC132V or DC110V to DC170V.
- AC input voltage must have a range from AC85V to AC132V or DC110V to DC170V for normal operation. If the wrong input is applied, the unit will not operate properly and/or may be damaged.
- In cases that conform with safety standard, input voltage range is AC100-AC120V(50/60Hz).

## 2.2 Inrush current limiting

- Inrush current limiting is built-in.
- If a switch in the input side is installed, it has to be the one handling the input inrush current.

## ●LCA15S · LCA30S · LCA50S · LCA75S

- If the unit is shut down, recycling AC line has to be done after cooling down the unit since thermistor is used for the protection from the inrush current.

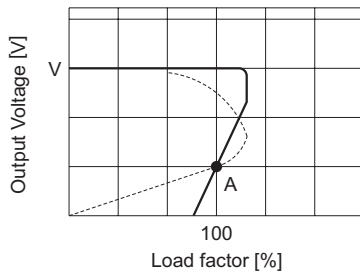
## ●LCA100S · LCA150S

- The SCR is used for protection from inrush current. When power is turned ON/OFF repeatedly within a short period of time, it is necessary to have enough time between power ON and OFF to operate resistance circuit for inrush current.

### 2.3 Overcurrent protection

●LCA10S · LCA15S · LCA30S

- Overcurrent protection is built-in and comes into effect at over 105% of the rated current. Overcurrent protection prevents the unit from short circuit and overcurrent condition of less than 1 minute. The unit automatically recovers when the fault condition is cleared.
- When the overcurrent/short circuit condition continues more than 1 minute, it may damage devices inside the power supply.
- The power supply which has a current foldback characteristics may not start up when connected to nonlinear load such as lamp, motor or constant current load. See the characteristics below.



—: Load characteristics of power supply.  
 - - - - -: Characteristics of load (lamp, motor, constant current load, etc.)  
 Note: In case of nonlinear load, the output is locked out at A point.

Fig.2.1 Current foldback characteristics

●LCA50S · LCA75S · LCA100S · LCA150S

- Overcurrent protection is built-in and comes into effect at over 105% of the rated current. Overcurrent protection prevents the unit from short circuit and overcurrent condition of less than 15 seconds. The unit automatically recovers when the fault condition is cleared.

### 2.4 Overvoltage protection

●LCA10S · LCA15S · LCA30S

- Overvoltage protection circuit, clamping the output voltage by zener diode, is built-in and comes into effect at over 115% of the rated voltage (For 3V type, overvoltage protection kicks in at over 4V). The unit in an overvoltage protection mode cannot be recovered by a user, it must be repaired at the factory. Overvoltage protection (diode) also comes into effect if the voltage is externally applied to the output side. Avoid applying voltage to the output side.

●LCA50S · LCA75S · LCA100S · LCA150S

- The overvoltage protection circuit is built-in and comes into effect at 115 - 140% of the rated voltage. The AC input should be shut down if overvoltage protection is in operation. The minimum interval of AC recycling for recovery is 1.5 minutes.
- ★ The recovery time varies depending on input voltage.

Remarks:

Please avoid applying the over-rated voltage to the output terminal. Power supply may operate incorrectly or fail. In case of operating a motor etc., please install an external diode on the output terminal to protect the unit.

### 2.5 Output voltage adjustment range

●LCA30S · LCA50S · LCA75S

- Adjustment of output voltage is possible by using potentiometer (Only available to 3V output voltage type).
- Output voltage is increased by turning potentiometer clockwise and is decreased by turning potentiometer counterclockwise.
- Modified unit "-Y" is recommended which can adjust the output voltage.

●LCA100S · LCA150S

- Adjustment of output voltage is possible by using potentiometer (Only available to 3 and 5V output voltage type).
- Output voltage is increased by turning potentiometer clockwise and is decreased by turning potentiometer counterclockwise.
- Modified unit "-Y" is recommended which can adjust the output voltage.

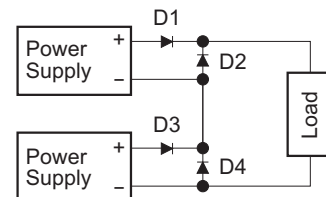
LCA

## 3 Series Operation and Parallel Operation

●LCA10S · LCA15S · LCA30S

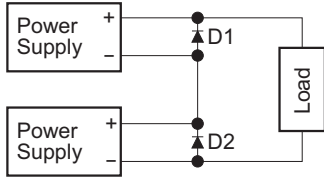
- Series operation is available by connecting the output of two or more power supplies, as shown below. Output current in series connection should be lower than the lowest rated current in each unit.

(a) When the output voltage is less than 5V.



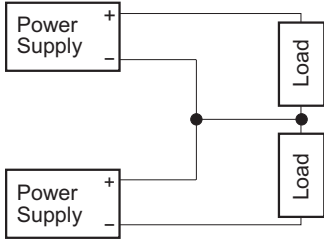
D1 - D4: Please use Schottky Barrier Diode

When the output voltage is more than 12V.

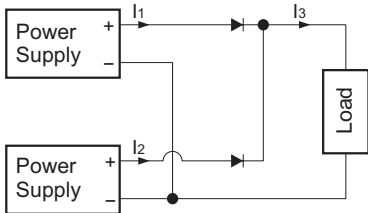


D1 · D2: Please use Schottky Barrier Diode

(b)



- Parallel operation is not possible.
- Redundancy operation is available by wiring as shown below.

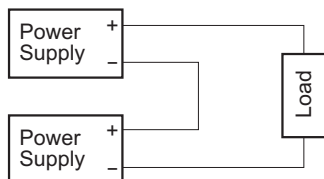


- Even a slight difference in output voltage can affect the balance between the values of  $I_1$  and  $I_2$ . Please make sure that the value of  $I_3$  does not exceed the rated current of a power supply.
- $$I_3 \leq \text{the rated current value}$$

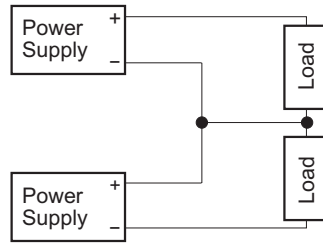
## ● LCA50S · LCA75S · LCA100S · LCA150S

- Series operation is available by connecting the output of two or more power supplies, as shown below. Output current in series connection should be lower than the lowest rated current in each unit.

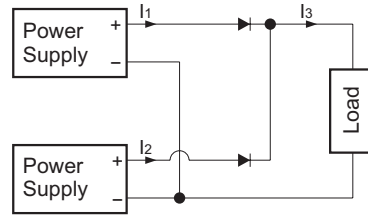
(a)



(b)



- Parallel operation is not possible.
- Redundancy operation is available by wiring as shown below.



- Even a slight difference in output voltage can affect the balance between the values of  $I_1$  and  $I_2$ . Please make sure that the value of  $I_3$  does not exceed the rated current of a power supply.
- $$I_3 \leq \text{the rated current value}$$

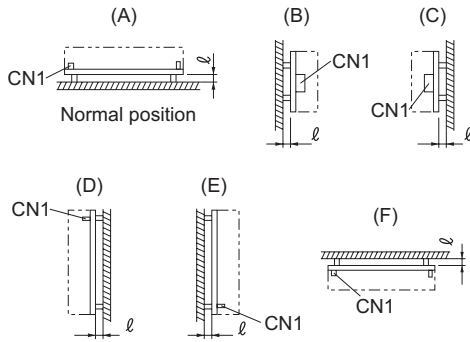
## 4 Assembling and Installation Method

### 4.1 Installation method

- When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in derating curve.
- Please be careful with that metal parts do not touch mounted parts at front side, where major components are mounted, when a power supply is installed with them.

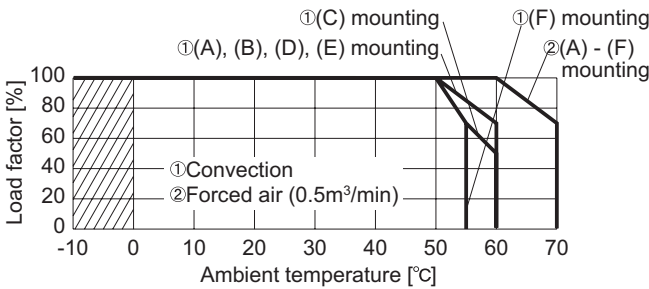
### 4.2 Derating

- The operative ambient temperature is different by with/without case cover or mounting position. Please refer drawings as below. Valid ambient temperature is different depending on the use of the cover or the mounting positions. Please refer to the following derating curve.
- When unit mounted except below drawings, it is required to consider ventilated environment by forced air cooling for temperature/load derating. For details, please consult our sales or engineering departments.

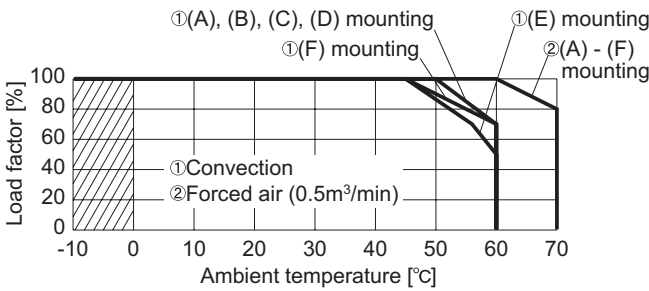


■ In case of metal chassis, keep more than 8mm for the part of  $l$  to insulate between lead of component & metal chassis. If it is less than 8mm, insert the insulation sheet between power supply & metal chassis.

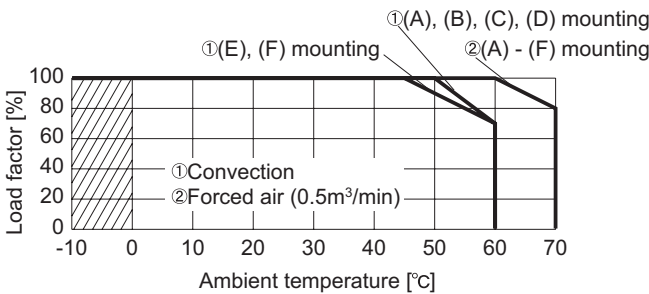
● LCA10S



● LCA15S

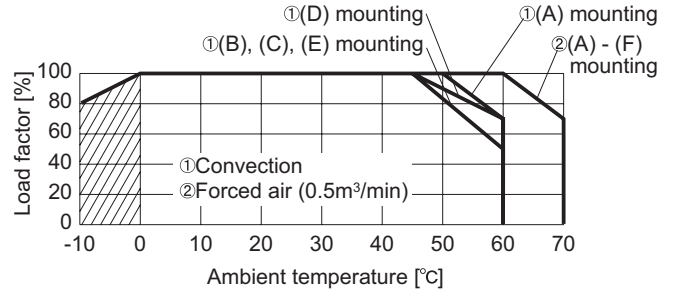


● LCA30S



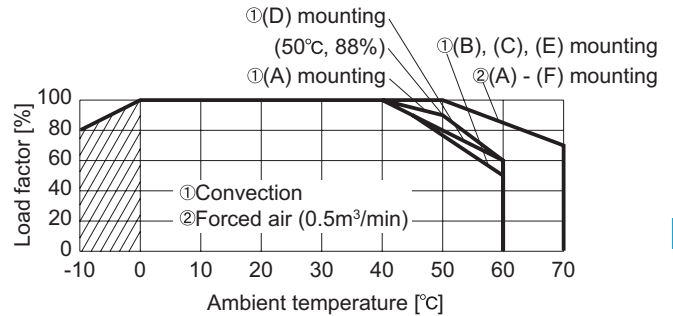
● LCA50S

For 3V, 5V, 12V, 15V



\* (F) mounting should be operated by Forced air.

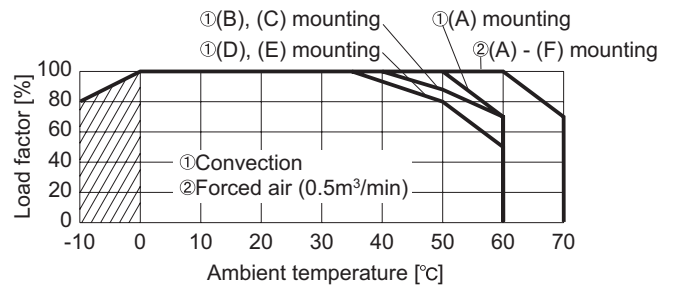
For 24V, 36V, 48V



\* (F) mounting should be operated by Forced air.

Note: In the hatched area, the specification of Ripple, Ripple Noise is different from other area.

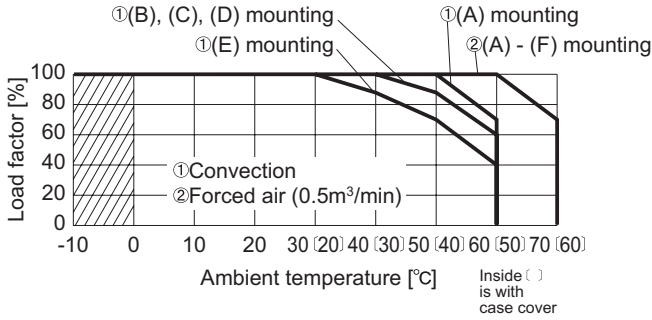
● LCA75S



\* (F) mounting should be operated by Forced air.

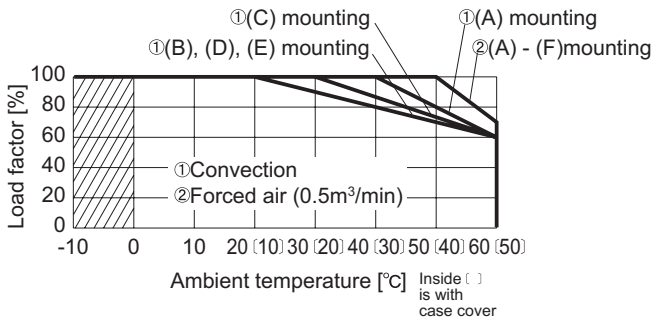
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●LCA100S



★ (F) mounting should be operated by Forced air.

●LCA150S



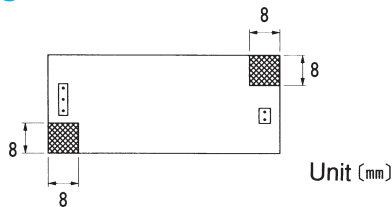
★ (F) mounting should be operated by Forced air.

Note: In the hatched area, the specification of Ripple, Ripple Noise is different from other area.

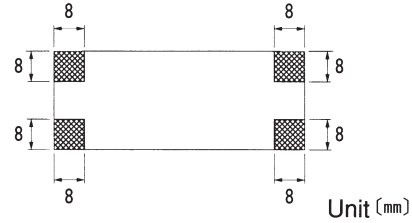
4.3 Mounting screw

- The mounting screw should be M3. The hatched area shows the allowance of metal parts for mounting.
- Keep isolation distance between metal parts for mounting and internal components.

●LCA10S



●LCA15S · LCA30S · LCA50S · LCA75S · LCA100S · LCA150S



- Keep isolation distance between screw and internal components, as below chart.

5 Ground

- When installing the power supply with your unit, ensure that the input FG terminal or mounting hole FG is connected to safety ground of the unit. However, when applying the safety agency, connect the input FG terminal to safety ground of the unit.

6 Others

- This power supply is rugged PCB type. Do not drop conductive objects in the power supply.
- At light load, there remains high voltage inside the power supply for a few minutes after power off. So at maintenance, take care about electric shock.