Basic Characteristics Data

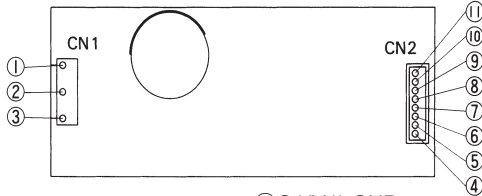| Model	Circuit method	Switching frequency [kHz]	Input current [A]	Fuse [A]	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
LDC15F	Flyback converter	40 - 350	0.4	2	Resistance of line filter	CEM-3	Yes		*1	No
LDC30F	Flyback converter	40 - 400	0.8	3	Thermistor	CEM-3	Yes		*1	No
LDC60F	Flyback converter	30 - 500	1.4	3	Thermistor	CEM-3	Yes		*1	No

*1 Refer to Instruction Manual.
* The value of input current shown is at AC IN 100V and rated load.
* Switching frequency of flyback converter depends on input voltage and load factor.

1 Terminal Block

●LDC15F

①Frame ground
②AC(N)
③AC(L)
④V1 Output
⑤V1 Output
⑥G1(V1) GND

⑦G1(V1) GND
⑧V2 Output
⑨G2(V2, V3) GND
⑩G2(V2, V3) GND
⑪V3 Output

●LDC30F
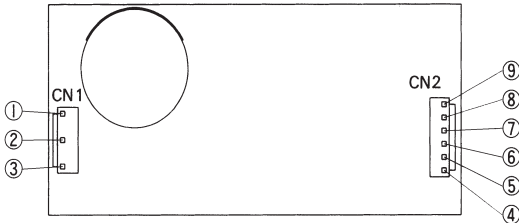
①Frame ground
②AC(N)
③AC(L)
④V1 Output
⑤G1(V1) GND

⑥V2 Output
⑦G2(V2, V3) GND
⑧G2(V2, V3) GND
⑨V3 Output

●LDC60F
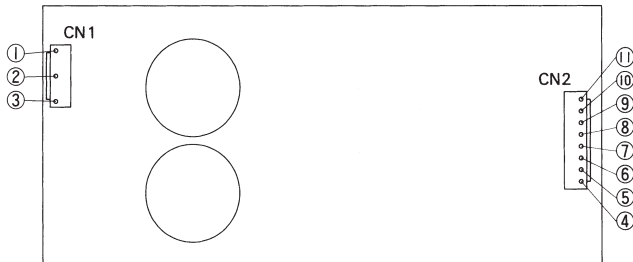
①Frame ground
②AC(N)
③AC(L)
④V1 Output
⑤V1 Output
⑥G1(V1) GND

⑦G1(V1) GND
⑧V2 Output
⑨G2(V2, V3) GND
⑩G2(V2, V3) GND
⑪V3 Output

2 Function

2.1 Input voltage range

■The range is from AC85V to AC264V or DC110V to DC370V.

■AC input voltage must have a range from AC85V to AC264V or DC110V to DC370V 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-AC240V(50/60Hz).

2.2 Inrush current limiting

■Inrush current limiting is built-in.

■If a switch on the input side is installed, it has to be the one handling the input inrush current.

■The thermistor 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 for power supply to cool down.

2.3 Overcurrent protection

■Overcurrent protection is built-in and comes into effect over 105% of the rated current. Overcurrent protection prevents the unit from short circuit and overcurrent condition of less than 10 seconds. The unit automatically recovers when the fault condition is cleared.

■When the overcurrent/short circuit condition continues more than 10 seconds, 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.
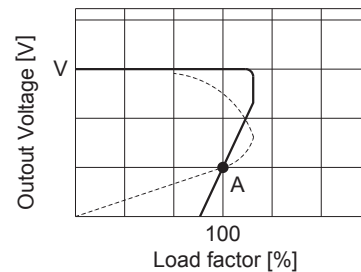
——— : Load characteristics of power supply.
- - - - - : Characteristics of load (lamp, motor, constant current load, etc.).
Note: In case of nonlinear load, the output is locked out at A point.

Fig.2.1 Current foldback characteristics

●LDC60F

■When overcurrent protection comes into effect only for V1, the output voltage of V2 & V3 will not drop.

2.4 Overvoltage protection

●LDC30F

■In V1, 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 5 minutes (★).

★ The recovery time varies depending on input voltage.

●LDC15F・LDC60F

■Overvoltage protection circuit, clamping the output voltage by zener diode, is built-in and comes into effect at over 115% of the rated voltage (except LDC15F V_2,V_3 and LDC60F V_3). 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.

Moreover, when the overvoltage is applied to output of power supply from outside, this diode operates, please avoid applying overvoltage externally.

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

■Adjustment of output voltage for V1 is possible by using potentiometer.

■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.
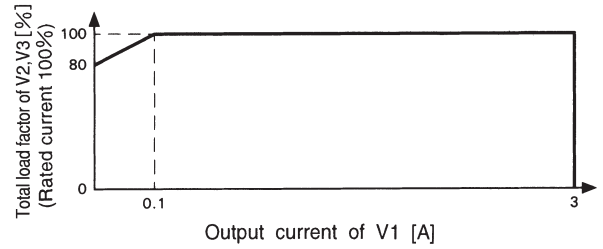
2.6 Minimum output current

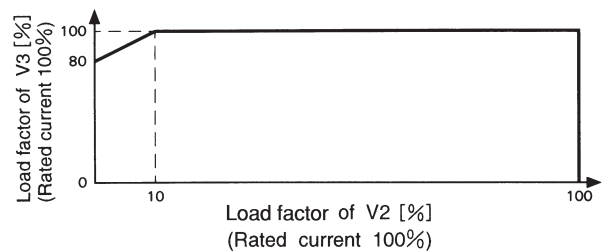■By V1 (+5V) load condition, the load factor of V2 and V3 are changed as below.

●LDC15F
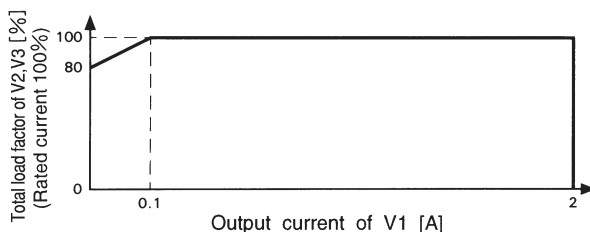
●LDC30F

■By V2 load condition, the load factor of V3 is changed as below.

●LDC60F

3 Series Operation and Parallel Operation

■Series operation with V2 and V3 is available by connecting the outputs of the unit as shown below. Output current in series connection should be lower than the lowest output current of the unit.

■Series operation with other model is not possible.

■By adding diode externally at the output side, series operation with V2 and V3 is available. For details, please contact our sales or engineering departments.

■Parallel operation is not possible.

4 Assembling and Installation Method
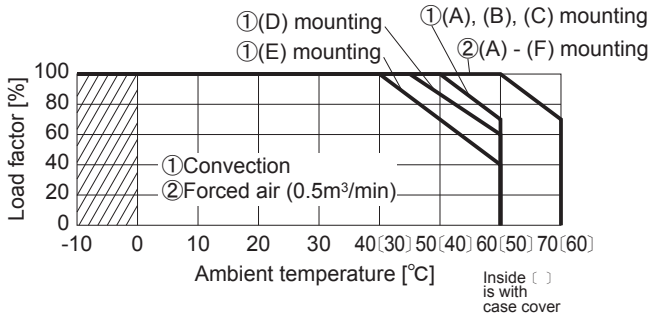
4.1 Installation method

■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 carefull 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.
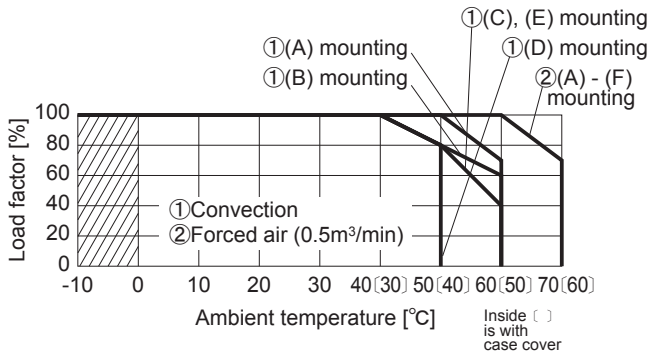
4.2 Derating

■The operative ambient temperature is different by with/without case cover or mounting position. Please refer drawings as below.
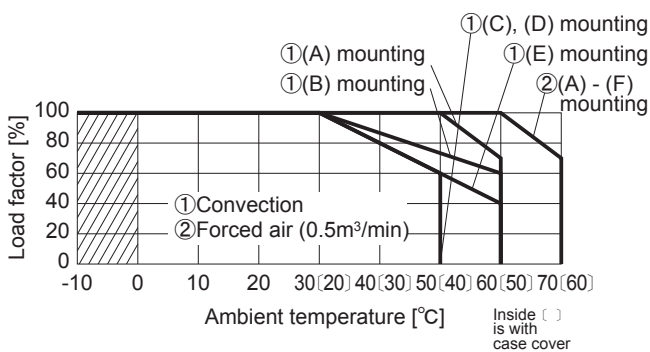
●LDC15F

①(D) mounting
①(E) mounting
①(A), (B), (C) mounting
②(A) - (F) mounting

①Convection
②Forced air (0.5m³/min)

Load factor [%]
Ambient temperature [℃]
Inside 〔 〕 is with case cover

●LDC30F

①(A) mounting
①(B) mounting
①(C), (E) mounting
①(D) mounting
②(A) - (F) mounting

①Convection
②Forced air (0.5m³/min)

Load factor [%]
Ambient temperature [℃]
Inside 〔 〕 is with case cover

●LDC60F

①(A) mounting
①(B) mounting
①(C), (D) mounting
①(E) mounting
②(A) - (F) mounting

①Convection
②Forced air (0.5m³/min)

Load factor [%]
Ambient temperature [℃]
Inside 〔 〕 is with case cover

Note:

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

■When unit mounted except below drawings, it is required to consider ventilated environment by forced air cooling or temperature/load derating. For details, please consult our sales or engineering departments.

(A)
CN1
Normal mounting

(B)
CN1
ℓ

(C)
CN1 ℓ

(D)
CN1
ℓ

(E)
ℓ
CN1

(F)
CN1
(Only when forced air)
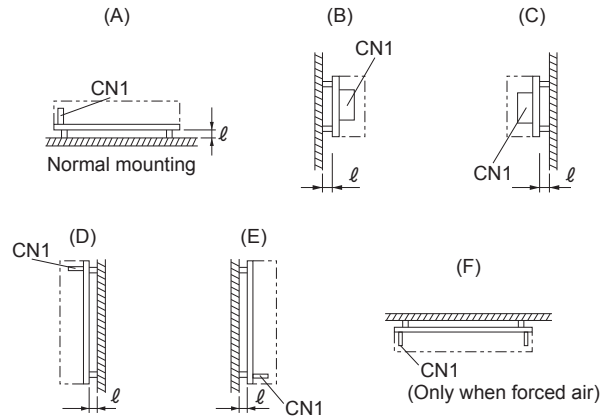
■In case of metal chassis, keep more than 8mm for the part of ℓ to insulate between lead of component and metal chassis. If it is less than 8mm, insert the insulation sheet between power supply and metal chassis.
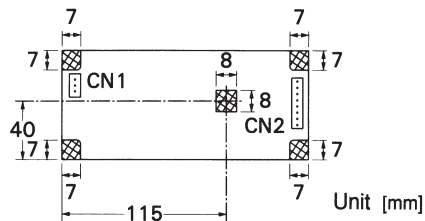
4.3 Mounting screw

■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.
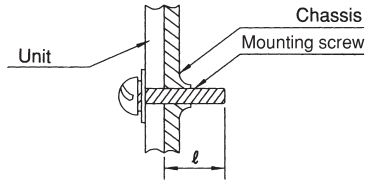
●LDC15F・LDC30F

7
7
7
7
CN1
CN2
7
7
7
7
Unit [mm]

●LDC60F

7
7
7
8
7
CN1
8
CN2
40
7
7
7
7
115
Unit [mm]
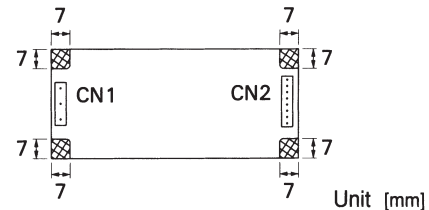
■Keep isolation distance between screw and internal components, as below chart.

Chassis
Mounting screw
Unit

Unit:[mm]

Model	ℓ max
LDC15F-☐-SN	8
LDC30F-☐-SN	8
LDC60F-☐-SN	8

5 Peak Loading

■Peak load current is possible to draw 10 seconds subject the average current should be less than the rated current. It will damage devices inside the power supply when the peak load current continues more than 10 seconds.

6 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.

7 Others

■This power supply is the 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.

■This power supply is manufactured by SMD technology. The stress to PCB like twisting or bending causes the defect of the unit, so handle the unit with care.

●LDC60F

■When overcurrent protection works at V1 only, the output voltage of V2 and V3 will not be dropped.