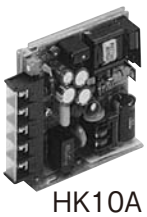
HK-A SERIES

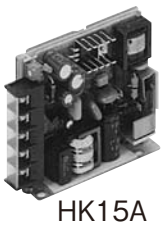
Single Output 10-150W

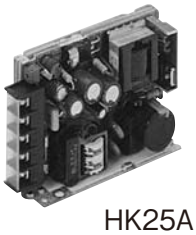

HK50A


HK100A


HK150A


HK10A


HK15A


HK25A

UL60950-1/ CSA C22.2 No.60950-1 | Low Voltage Directive | DENAN Built to meet Electrical Appliance and Material Safety Law (Input Voltage 100VAC) | 3 YEARS warranty

■ Features

- AC100Vin / Single output / Low cost
- Applicable to a wide range of applications, including FA industry facilities and medical equipment.
- 10W-150W standard products: 6 models 30 types
- 100W/150W type: Remote sensing available

■ Model naming method

HK 10A−5/□

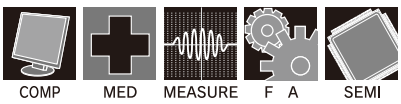
- Blank: Open frame with screw terminal (HK10A - HK150A)
- A: Screw terminals, with cover (HK10A - HK150A)
- B: Open frame & connector (HK10A - HK50A)
- C: Connectors & with cover (HK10A - HK50A)

Nominal output voltage

Output power

Series name

■ Applications



■ Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

■ Product Line up

Output Voltage	10W		15W		25W		50W		100W		150W	
	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model
3.3V	2.0A	HK10A-3	3.0A	HK15A-3	5.0A	HK25A-3	10.0A	HK50A-3	20.0A	HK100A-3	30.0A	HK150A-3
5V		HK10A-5		HK15A-5		HK25A-5	10.0A	HK50A-5		HK100A-5		HK150A-5
12V	0.9A	HK10A-12	1.3A	HK15A-12	2.1A	HK25A-12	4.2A	HK50A-12	8.5A	HK100A-12	12.5A	HK150A-12
15V	0.7A	HK10A-15	1A	HK15A-15	1.7A	HK25A-15	3.4A	HK50A-15	7A	HK100A-15	10A	HK150A-15
24V	0.5A	HK10A-24	0.7A	HK15A-24	1.1A	HK25A-24	2.2A	HK50A-24	4.5A	HK100A-24	6.5A	HK150A-24

HK10A Specifications

ITEMS/UNITS			MODEL	HK10A-3	HK10A-5	HK10A-12	HK10A-15	HK10A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	67	71	73	74	78
	Current (100VAC)(typ)	(*1)	A	0.2	0.3			
	Inrush Current (100VAC)(typ)		A	20				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	2.0		0.9	0.7	0.5
	Maximum Power		W	6.6	10.0	10.8	10.5	12.0
	Maximum Line Regulation	(*3)	mV	20		48	60	96
	Maximum Load Regulation	(*4)	mV	40		96	120	150
	Temperature Coefficient (typ)	(*8)		1% at 0℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range			±10%				
Function	Over Current Protection	(*5)		>105%				
	Over Voltage Protection	(*6)		>115%				
	Series Operation			Possible				
Environment	Operating Temperature	(*7)	℃	0 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			10-55Hz (sweep 1 min) less than 19.6m/s² X, Y, Z 1 h each				
	Shock			Less than 196.1m/s²				
	Cooling			Convection Cooled				
Isolation	Withstand Voltage	(*9)		Input - Chassis , Input - Output : 2 k VAC (20mA) Output - Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100M Ohm at 25℃ and 70%RH Output-FG 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN. (HK10A-3 is built to meet safety standards.)				
	EMI			Built to meet FCC class B, VCCI - B				
Mechanical	Weight		g	150				
	Size (W x H x D)		mm	22 x 68 x 68 (Refer to outline drawing)				

(*1) At 100VAC and maximum output power, Ta = 25℃

(*2) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) From 85 to 132VAC or 110 to 175VDC, constant load.

(*4) From no load to full load, constant input voltage.

(*5) Current limiting with automatic recovery.
Avoid to operate over load or dead short for more than 30 seconds.

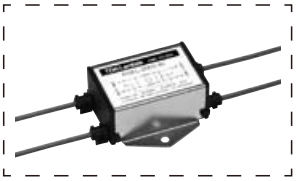
(*6) Over voltage clamping by zener diode.

(*7) At standard mounting (vertical).

(*8) Constant input voltage & load.

(*9) Refer to instruction manual for testing procedure.

●Recommended EMC Filter

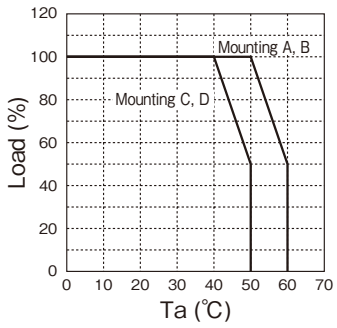


RSEL-20R5W

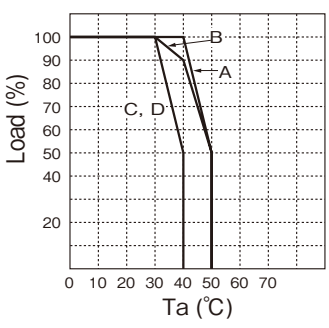
Please refer to "TDK-Lambda EMC Filters" catalog.

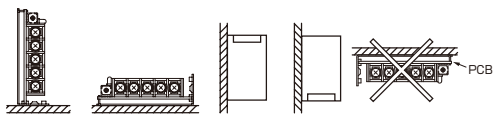
Derating Curve

Without cover



With cover





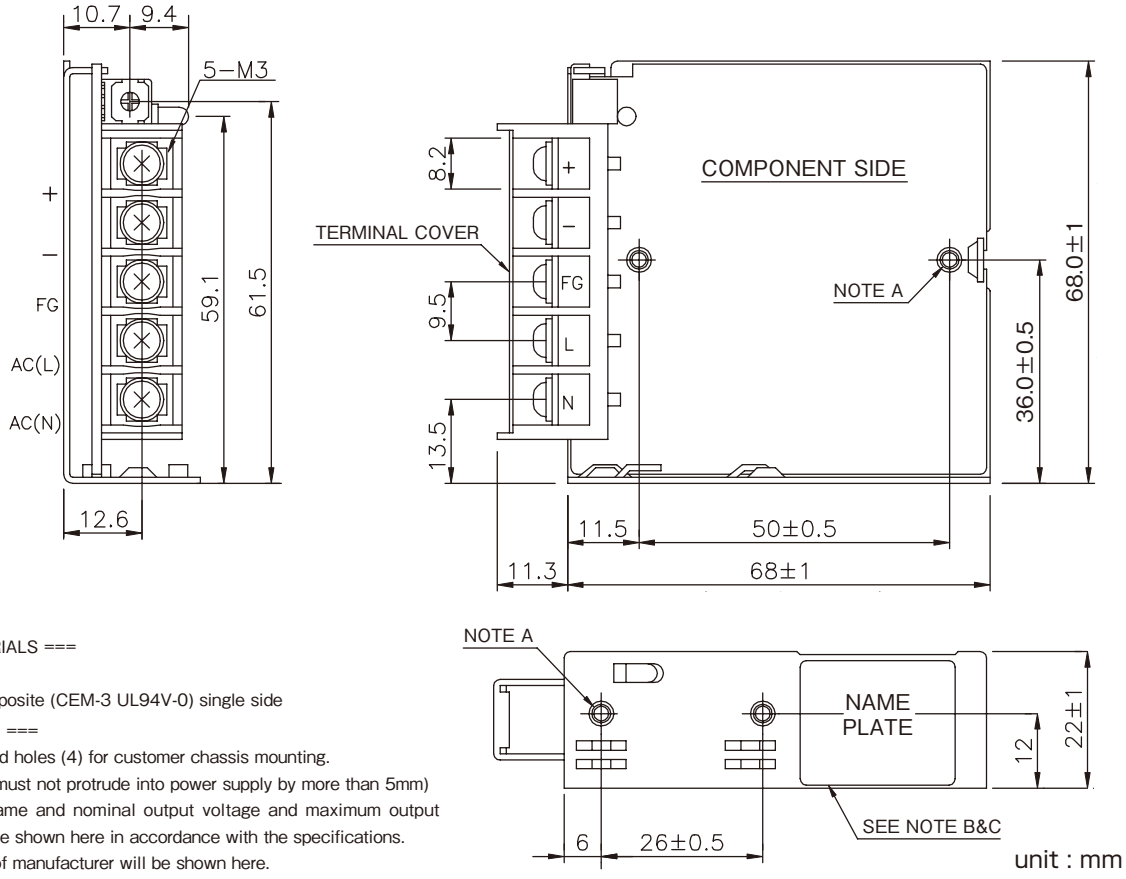
(A) (B) (C) (D) (E)Don't use

Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK10A】 Please see A-88 for HK10A/A and HK10A/C (with cover).

(Screw terminal)

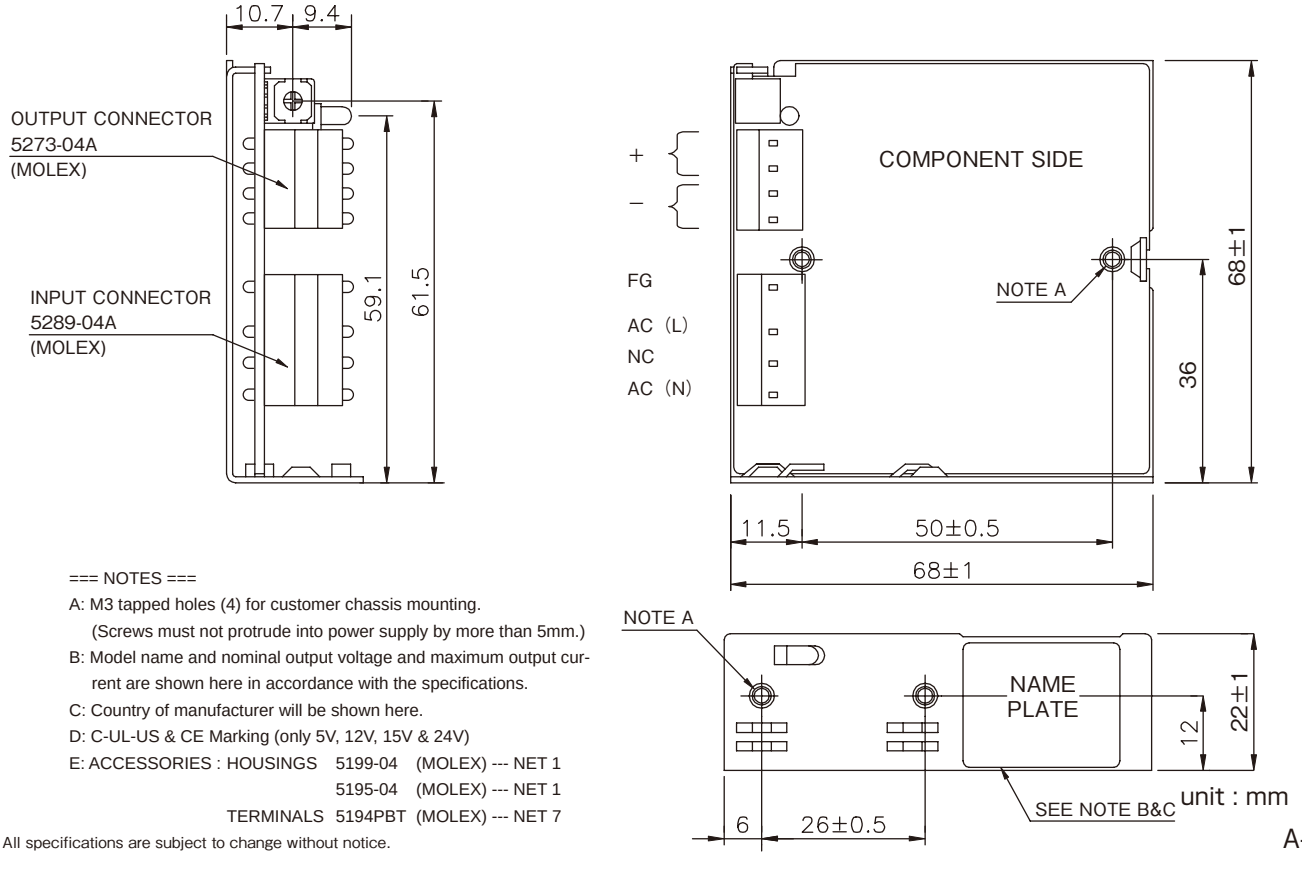


unit : mm

=== MATERIALS ===
Frame: Iron
PCB: Composite (CEM-3 UL94V-0) single side
=== NOTES ===
A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm)
B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
C: Country of manufacturer will be shown here.
D: C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)

【HK10A/B】

(With connector)



unit : mm

=== NOTES ===
A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)
B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
C: Country of manufacturer will be shown here.
D: C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)
E: ACCESSORIES : HOUSINGS 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

・All specifications are subject to change without notice.

HK15A Specifications

ITEMS/UNITS			MODEL	HK15A-3	HK15A-5	HK15A-12	HK15A-15	HK15A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	66	69	74	75	77
	Current (100VAC)(typ)	(*1)	A	0.3	0.4			
	Inrush Current (100VAC)(typ)		A	30				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	3.0	3	1.3	1	0.7
	Maximum Power		W	9.9	15.0	15.6	15.0	16.8
	Maximum Line Regulation	(*3)	mV	20		48	60	96
	Maximum Load Regulation	(*4)	mV	40		96	120	150
	Temperature Coefficient (typ)	(*8)		1% at 0℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range			±10%				
Function	Over Current Protection	(*5)		>105%				
	Over Voltage Protection	(*6)		>115%				
	Series Operation			Possible				
Environment	Operating Temperature	(*7)	℃	0 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			10-55Hz (sweep 1 min) less than 19.6m/s² X, Y, Z 1 h each				
	Shock			Less than 196.1m/s²				
	Cooling			Convection Cooled				
Isolation	Withstand Voltage	(*9)		Input - Chassis , Input - Output : 2kVAC (20mA) Output - Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100M Ohm at 25℃ and 70%RH Output-FG 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN. (HK15A-3 is built to meet safety standards.)				
	EMI			Built to meet FCC class B, VCCI - B				
Mechanical	Weight		g	170				
	Size (W x H x D)		mm	23.5 x 68 x 80 (Refer to outline drawing)				

(*1) At 100VAC and maximum output power, Ta = 25℃

(*2) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) From 85 to 132VAC or 110 to 175VDC, constant load.

(*4) From no load to full load, constant input voltage.

(*5) Current limiting with automatic recovery.
Avoid to operate over load or dead short for more than 30 seconds.

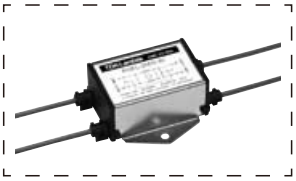
(*6) Over voltage clamping by zener diode.

(*7) At standard mounting (vertical).

(*8) Constant input voltage & load.

(*9) Refer to instruction manual for testing procedure.

●Recommended EMC Filter

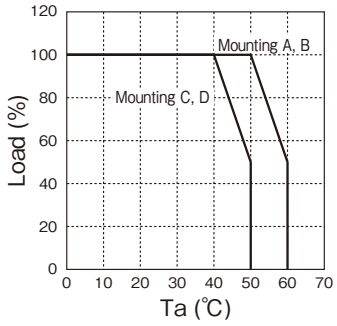


RSEL-2001W

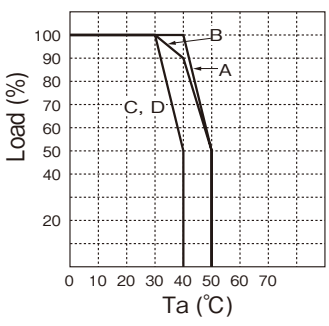
Please refer to "TDK-Lambda EMC Filters" catalog.

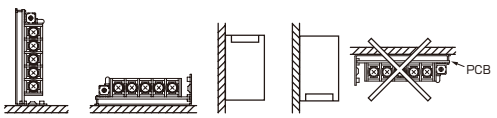
OUTPUT DERATING

Without cover



With cover





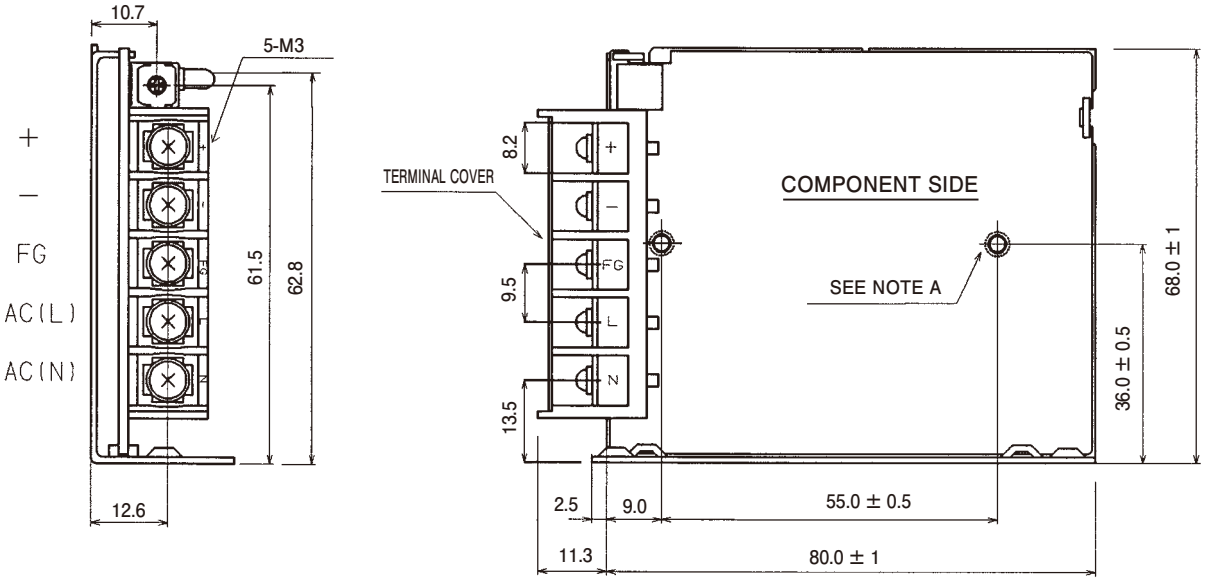
(A) (B) (C) (D) (E)Don't use

Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK15A】 Please see A-89 for HK15A/A and HK15A/C (with cover).

(With screw terminal)



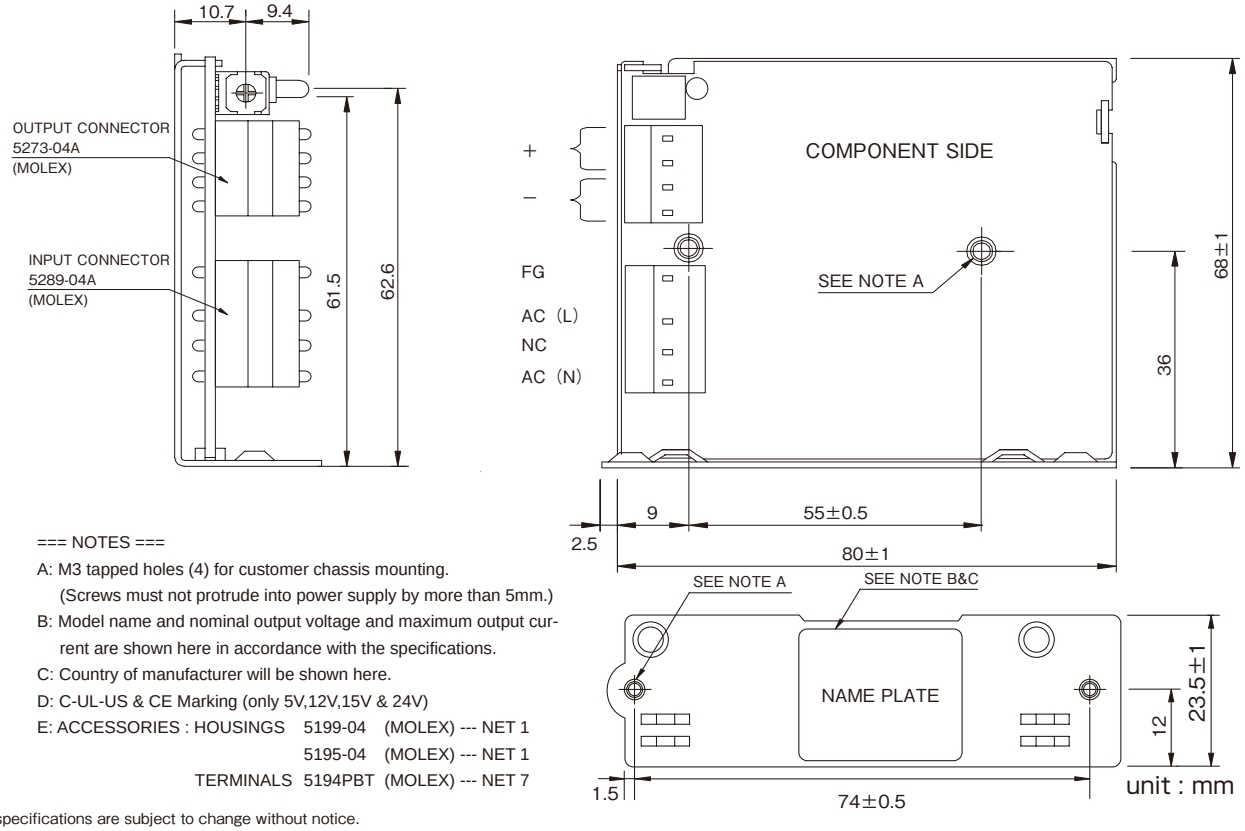
(unit : mm)

=== MATERIALS ===
Frame: Iron
PCB: Composite (CEM-3 UL94V-0) single side

=== NOTES ===
A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)
B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
C: Country of manufacturer will be shown here.
D: C-UL-US & CE Marking (only 5V,12V,15V & 24V)

【HK15A/B】

(With connectors)



unit : mm

=== NOTES ===
A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)
B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
C: Country of manufacturer will be shown here.
D: C-UL-US & CE Marking (only 5V,12V,15V & 24V)
E: ACCESSORIES : HOUSINGS 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

HK25A Specifications

ITEMS/UNITS		MODEL		HK25A-3	HK25A-5	HK25A-12	HK25A-15	HK25A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	70	72	76	77	80
	Current (100VAC)(typ)	(*1)	A	0.5	0.6			
	Inrush Current (100VAC)(typ)	(*3)	A	15				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	5.0	5.0	2.1	1.7	1.1
	Maximum Power		W	16.5	25.0	25.2	25.5	26.4
	Maximum Line Regulation	(*4)	mV	20		48	60	96
	Maximum Load Regulation	(*5)	mV	40		96	120	150
	Temperature Coefficient (typ)	(*9)		1% at 0℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range			±10%				
Function	Over Current Protection	(*6)		>105%				
	Over Voltage Protection	(*7)		115% to 135%				
	Series Operation			Possible				
Environment	Operating Temperature	(*8)	℃	0 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			10-55Hz (sweep 1 min) less than 19.6m/s² X, Y, Z 1 h each				
	Shock			Less than 196.1m/s²				
	Cooling			Convection Cooled				
Isolation	Withstand Voltage	(*10)		Input-Chassis, Input-Output : 2kVAC (20mA) Output-Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100MΩ at 25℃ and 70% RH Output-FG 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN. (HK25A-3 is built to meet safety standards.)				
	EMI			Built to meet FCC class B,VCCI-B				
Mechanical	Weight		g	230				
	Size (W x H x D)		mm	28 x 68 x 95 (Refer to outline drawing)				

(*1) At 100VAC & maximum output power,Ta = 25 ℃ .

(*2) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) Typical value on cold start, Ta=25℃.

(*4) From 85 to 132VAC or 110 to 175VDC, constant load.

(*5) From no load to full load, constant input voltage.

(*6) Current limiting with automatic recovery.
Avoid to operate over load or dead short for more than 30 seconds.

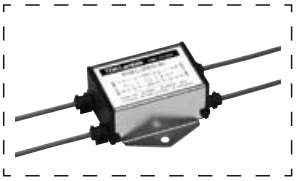
(*7) Inverter shut down, manual reset.

(*8) At standard mounting (vertical).

(*9) Constant input voltage & load.

(*10) Refer to instruction manual for testing procedure.

●Recommended EMC Filter

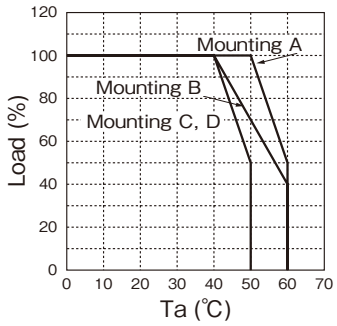


RSEL-2001W

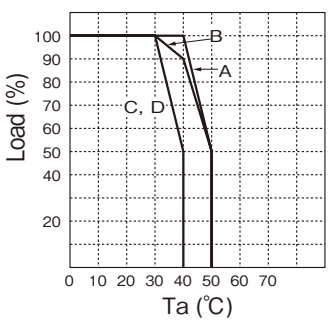
Please refer to "TDK-Lambda EMC Filters" catalog.

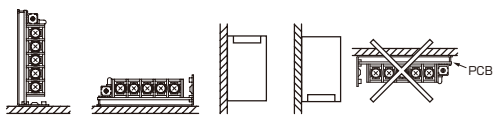
OUTPUT DERATING

Without cover



With cover



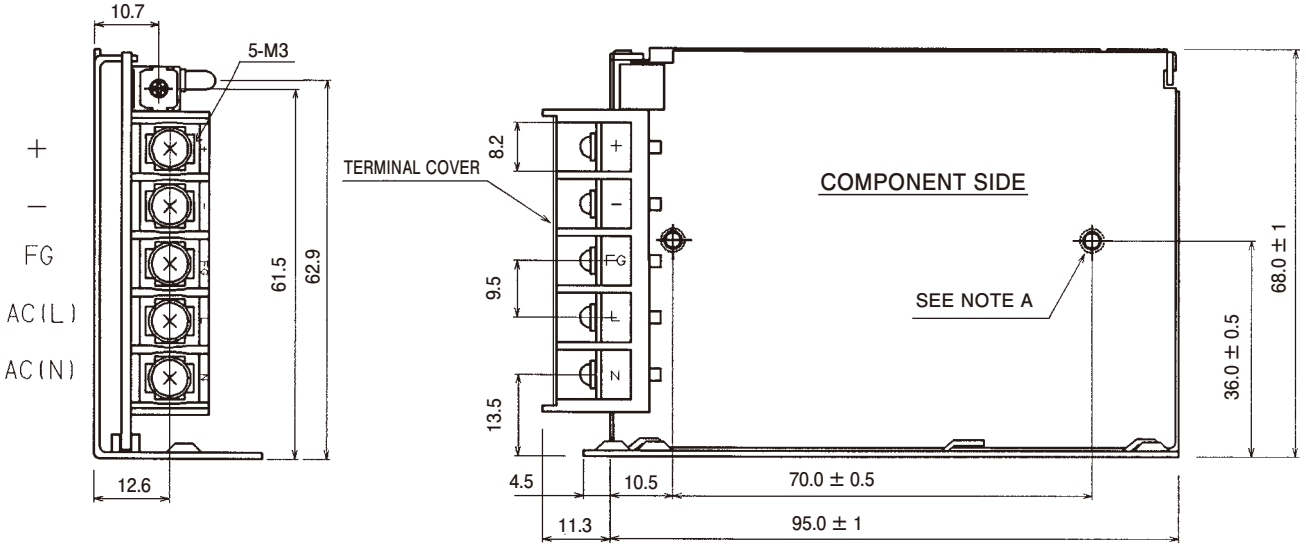


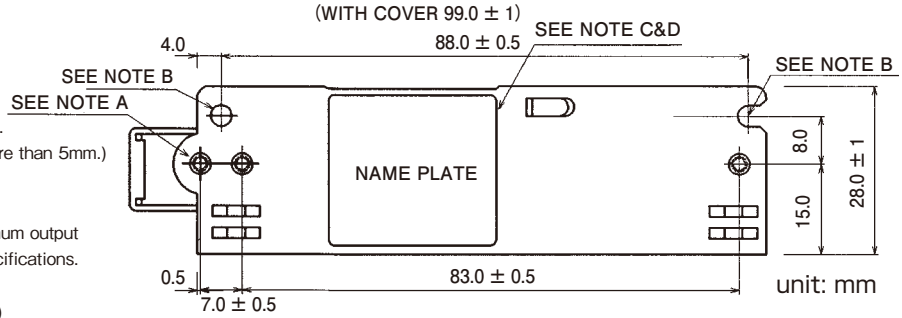
Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK25A】 Please see A-90 for HK25A/A and HK25A/C (with cover).

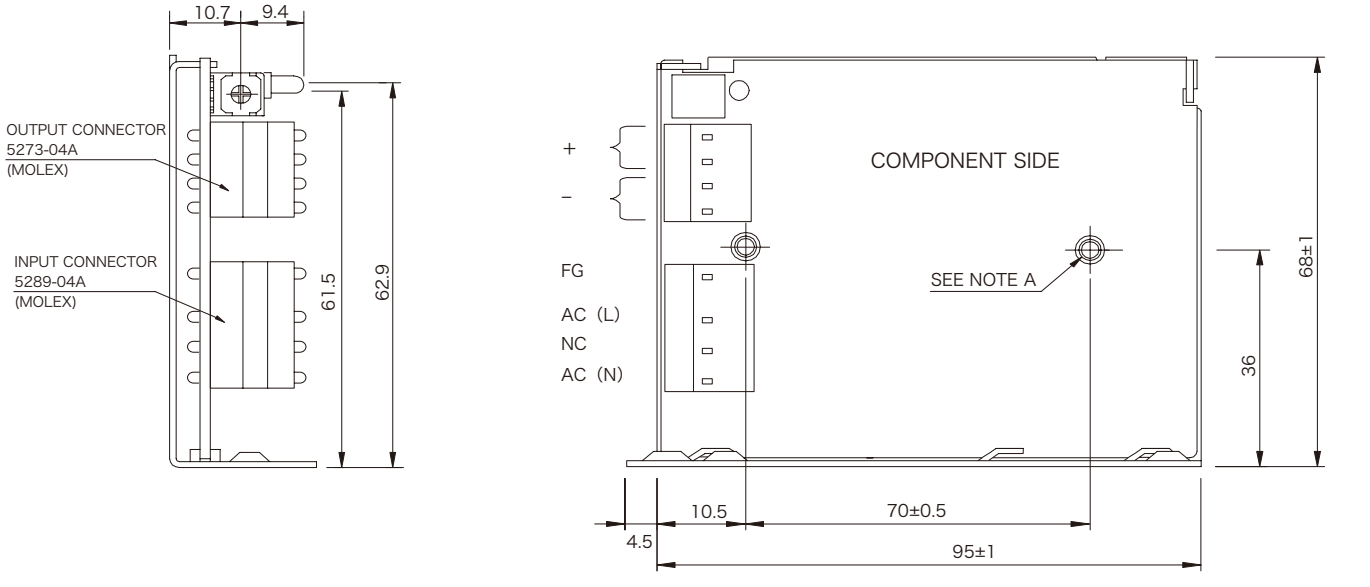
(With screw terminal)

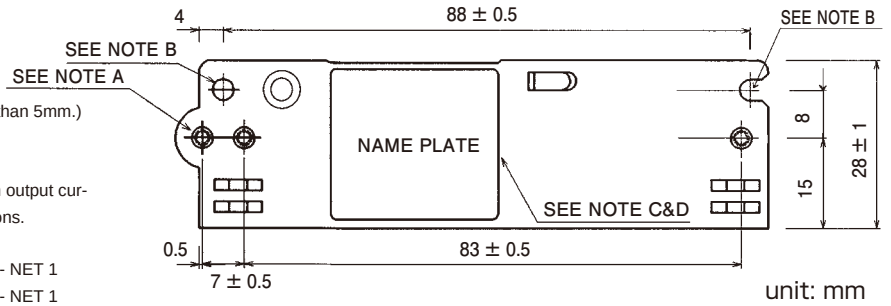




=== MATERIALS ===
Frame: Iron
PCB: Composite (CEM-3 UL94V-0) single side
=== NOTES ===
A: M3 tapped holes (5) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)
B: Φ3.5 holes (2) for customer chassis mounting.
(Use M3 mounting screws.)
C: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
D: Country of manufacturer will be shown here.
E: C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)

【HK25A/B】(With connectors)





=== NOTES ===
A: M3 tapped holes (5) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)
B: φ3.5 Holes (2) for customer chassis mounting.
(Use M3 mounting screws.)
C: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.
D : Country of manufacturer will be shown here.
E : ACCESSORIES HOUSING 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7
F : C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)

HK50A Specifications

ITEMS/UNITS		MODEL		HK50A-3	HK50A-5	HK50A-12	HK50A-15	HK50A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	74	79	81	82	84
	Current (100VAC)(typ)	(*1)	A	0.8	1.2			
	Inrush Current (100VAC)(typ)	(*3)	A	30				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	10.0	10.0	4.2	3.4	2.2
	Maximum Power		W	33	50.0	50.4	51.0	52.8
	Maximum Line Regulation	(*4)	mV	20		48	60	96
	Maximum Load Regulation	(*5)	mV	40		96	120	150
	Temperature Coefficient(typ)	(*9)		1% at 0℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range			±10%				
Function	Over Current Protection	(*6)		>105%				
	Over Voltage Protection	(*7)		115%~135%				
	Series Operation			Possible				
Environment	Operating Temperature	(*8)	℃	0 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			10-55Hz (sweep 1 min) less than 19.6m/s² X, Y, Z 1 h each				
	Shock			Less than 196.1m/s²				
	Cooling			Convection Cooled				
Isolation	Withstand Voltage	(*10)		Input - Chassis, Input - Output : 2kVAC (20mA) Output - Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100M Ohm at 25℃ and 70%RH Output-FG 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN. (HK50A-3 is built to meet safety standards.)				
	EMI			Built to meet FCC class B, VCCI - B				
Mechanical	Weight		g	280				
	Size (W x H x D)		mm	31 x 68 x 119 (Refer to outline drawing)				

(*1) At 100VAC & maximum output power,Ta = 25 ℃ .

(*2) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) Typical value on cold start, Ta=25℃.

(*4) From 85 to 132VAC or 110 to 175VDC, constant load.

(*5) From no load to full load, constant input voltage.

(*6) Current limiting with automatic recovery.
Avoid to operate over load or dead short for more than 30 seconds.

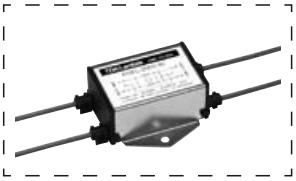
(*7) Inverter shut down, manual reset.

(*8) At standard mounting (vertical).

(*9) Constant input voltage & load.

(*10) Refer to instruction manual for testing procedure.

●Recommended EMC Filter

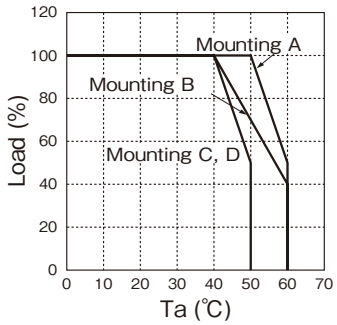


RSEL-2002W

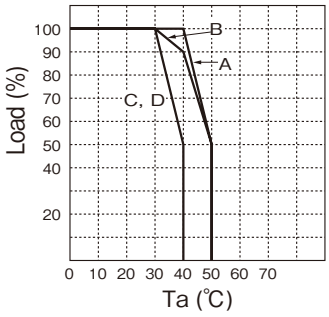
Please refer to "TDK-Lambda EMC Filters" catalog.

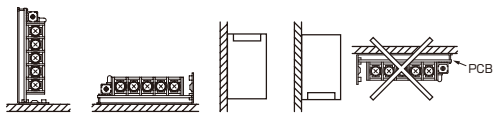
OUTPUT DERATING

Without cover



With cover



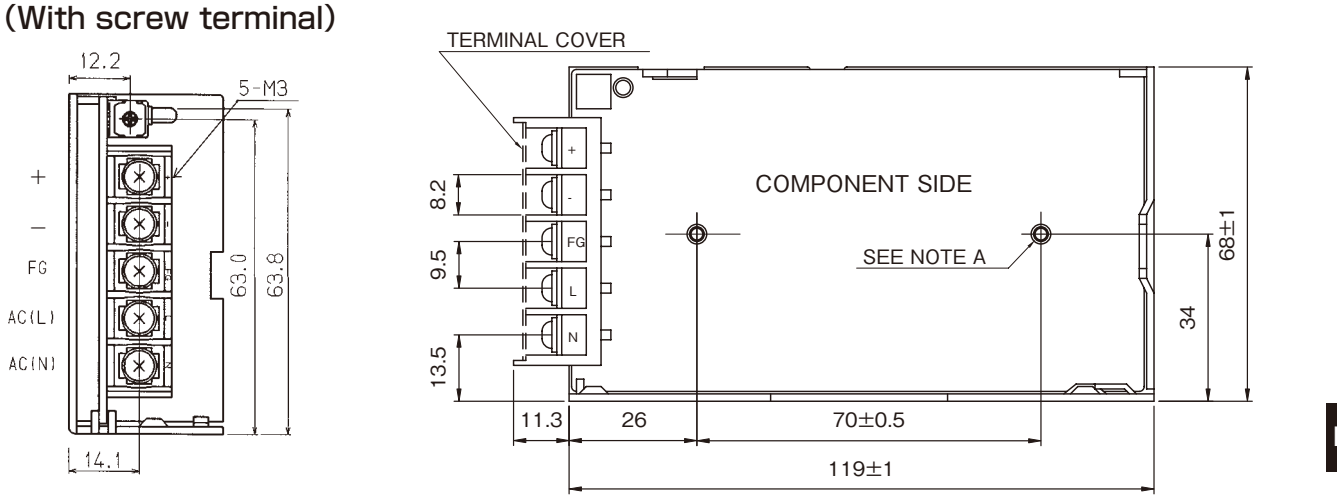


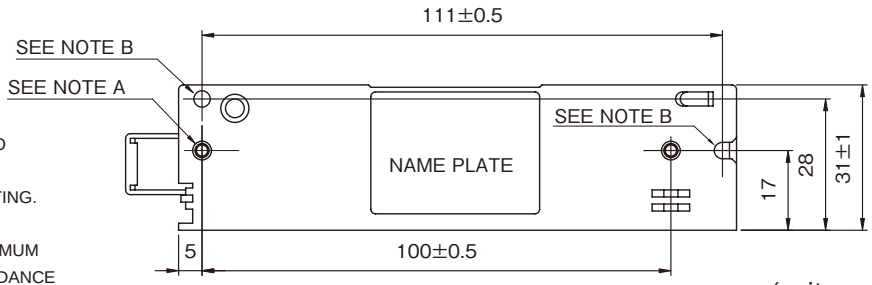
Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK50A】 Please see A-91 for HK50A/A and HK50A/C (with cover).

(With screw terminal)



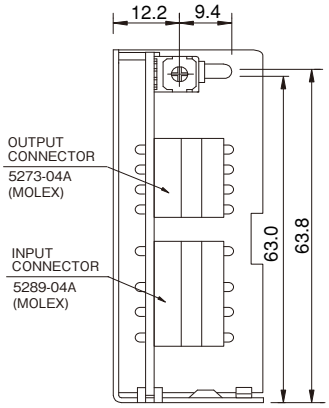


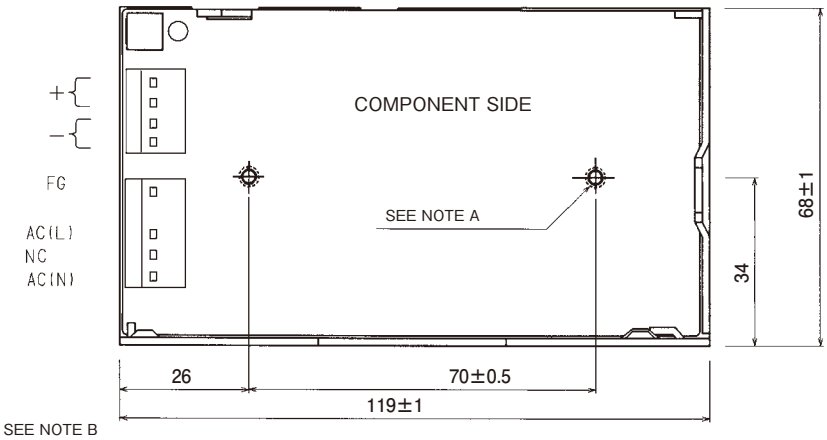
=== MATERIALS ===
Frame: Aluminum
PCB: Composite (CEM-3 UL94V-0) single side
=== NOTES ===
A: M3 TAPPED HOLES(4) FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 5mm.
B: Φ3.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING. (USE M3 MOUNTING SCREWS)
C: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
D: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
E: C-UL-US & CE MARKING (ONLY 5V,12V,15V & 24V)

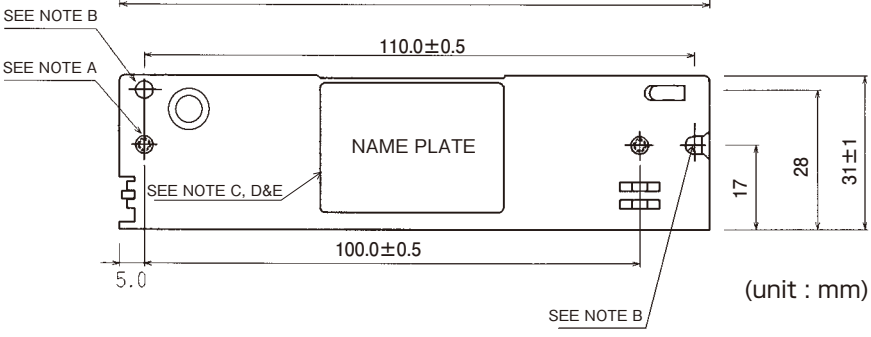
(unit : mm)

【HK50A/B】

(With connector)







=== NOTES ===
A: M3 TAPPED HOLES(4) FOR CUSTOMER CHASSIS MOUNTING.
(SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 5mm.)
B: Φ3.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING. (USE M3 MOUNTING SCREWS.)
C: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
D: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
E: C-UL-US & CE MARKING (ONLY 5V, 12V, 15V & 24V)
F: ACCESSORIES : HOUSINGS 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

(unit : mm)

HK100A Specifications

ITEMS/UNITS			MODEL	HK100A-3	HK100A-5	HK100A-12	HK100A-15	HK100A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	75	80	81		82
	Current (100VAC)(typ)	(*1)	A	1.5	2.2			
	Inrush Current (100VAC)(typ)		A	15				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	20		8.5	7	4.5
	Maximum Power		W	66	100.0	102.0	105.0	108.0
	Maximum Line Regulation	(*3)	mV	20		48	60	96
	Maximum Load Regulation	(*4)	mV	40		96	120	150
	Temperature Coefficient (typ)			1% at -10℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range (typ)			±10%				
Function	Over Current Protection	(*5)		>105%				
	Over Voltage Protection	(*6)		115% - 135%				
	Remote Sensing			Possible				
	Remote ON/OFF Control			-				
	Parallel Operation			-				
	Series Operation			Possible				
Environment	Operating Temperature	(*8)	℃	-10 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			Less than 19.6m/s²				
	Shock			Less than 196.1m/s²				
	Cooling			Convection cooled				
Isolation	Withstand Voltage	(*7)		Input - Chassis, Input - Output : 2kVAC (20mA) Output - Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100M Ohm at 25℃ and 70%RH, Output-Chassis 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN.				
	EMI			Built to meet FCC class B, VCCI - B				
Mechanical	Weight		g	540				
	Size (W x H x D)		mm	34.5 x 93 x 150 (Refer to outline drawing)				

(*1) At 100VAC & maximum output power, Ta = 25 ℃.

(*2) For cases where conformance to various safety specs (UL, CSA, VDE) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) From 85-132VAC or 110 - 175VDC, constant load.

(*4) From no load to full load, constant input voltage.

(*5) Current limiting with automatic recovery. (Refer to instruction manual for details.)

(*6) Inverter shutdown method, manual reset.

(*7) Refer to instruction manual for testing procedure.

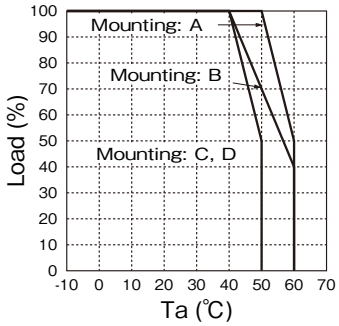
(*8) Ratings - Refer to derating curve on the right.
- Load(%) is percent of maximum output power or maximum output current, whichever is greater.
- Refer to instruction manual for further mounting details.

●Recommended EMC Filter

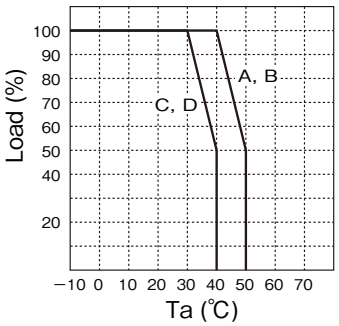
RSEN-2006
Please refer to "TDK-Lambda EMC Filters" catalog.

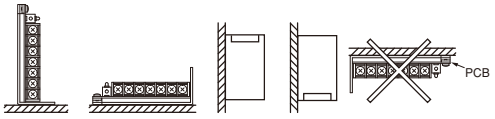
OUTPUT DERATING

WithoutCover : Open Frame Type



With cover

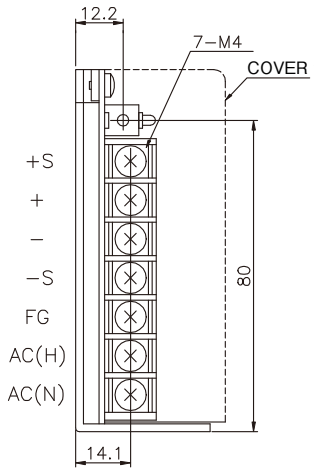


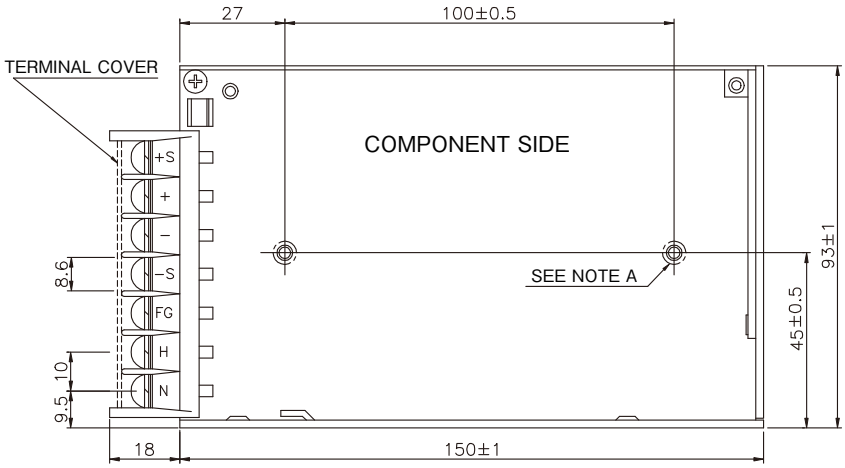


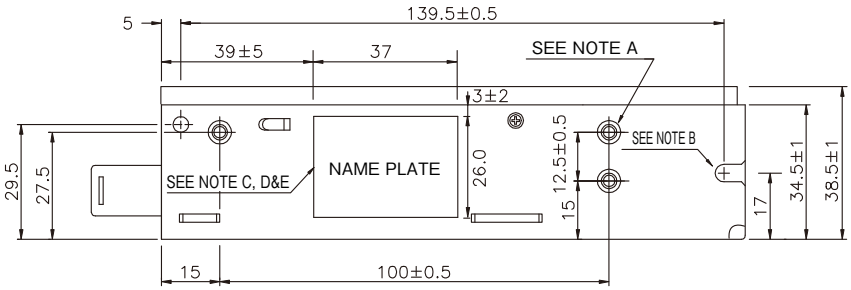
Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK100A】(With screw terminal)







(unit : mm)

=== NOTES ===

A: M4 tapped holes for customer chassis mounting. (Screws must not protrude into power supply by more than 6mm.)

B: Φ4.5 holes (2) for customer chassis mounting.

C: Country of manufacture will be shown here.

D: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

E: C-UL-US and CE Marking (Only 3.3V, 5V, 12V, 15V and 24V)

===ACCESSORIES===

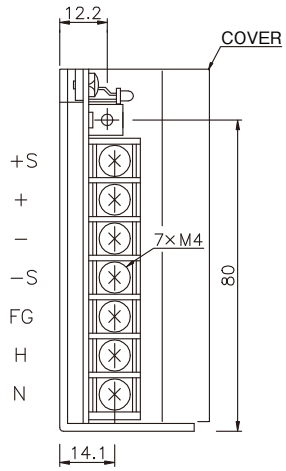
* COVER FOR BARRIER TERMINAL STRIP --- 1
  (MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT.)
* METAL PIESES FOR SHORTING PURPOSES --- 2
  (MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT.)

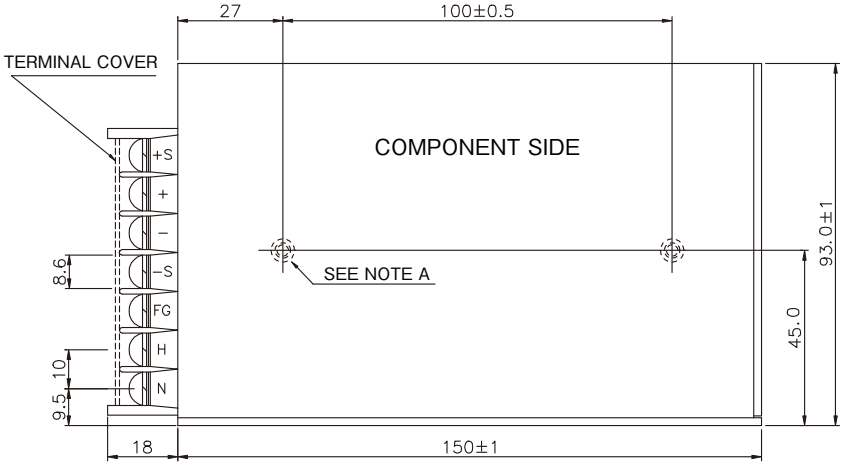
=== MATERIALS ===

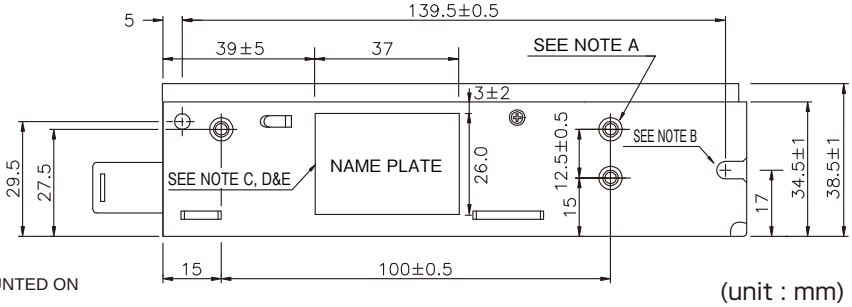
Frame: Aluminum

PCB: Composite (CEM-3 UL94V-0) single side

【HK100A/A】(With cover)







(unit : mm)

=== NOTES ===

A: M4 tapped holes for customer chassis mounting. (Screws must not protrude into power supply by more than 6mm)

B: Φ4.5 holes (2) for customer chassis mounting.

C: Country of manufacture will be shown here.

D: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

===ACCESSORIES===

*COVER FOR BARRIER TERMINAL STRIP --- 1 (MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT.)

*METAL PIESES FOR SHORTING PURPOSES --- 2 (MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT.)

HK-A

HK150A Specifications

ITEMS/UNITS			MODEL	HK150A-3	HK150A-5	HK150A-12	HK150A-15	HK150A-24
Input	Voltage Range	(*2)	V	AC85-132 or DC110-175				
	Frequency	(*2)	Hz	47-440				
	Efficiency (typ)	(*1)	%	75	80	81		82
	Current (100VAC)(typ)	(*1)	A	2.2	3.2			
	Inrush Current (100VAC)(typ)		A	15				
Output	Nominal Voltage		VDC	3.3	5	12	15	24
	Maximum Current		A	30		12.5	10	6.5
	Maximum Power		W	99	150			156
	Maximum Line Regulation	(*3)	mV	20		48	60	96
	Maximum Load Regulation	(*4)	mV	40		96	120	150
	Temperature Coefficient (%)(typ)			1% at -10℃ to +50℃				
	Maximum Ripple & Noise		mVp-p	120		150		
	Hold-up Time (typ)	(*1)	ms	20				
	Voltage Adjustable Range (typ)			±10%				
Function	Over Current Protection	(*5)		>105%				
	Over Voltage Protection	(*6)		115%-135%				
	Remote Sensing			Possible				
	Remote ON/OFF Control			-				
	Parallel Operation			-				
	Series Operation			Possible				
Environment	Operating Temperature	(*8)	℃	-10 to +50 (100%), 60 (50%)				
	Storage Temperature		℃	-30 to +85				
	Operating Humidity		%RH	30 - 90				
	Storage Humidity		%RH	10 - 95				
	Vibration			Less than 19.6m/s²				
	Shock			Less than 196.1m/s²				
	Cooling			Convection cooled				
Isolation	Withstand Voltage	(*7)		Input - Chassis, Input - Output : 2kVAC (20mA) Output - Chassis : 500VAC (100mA) for 1min				
	Isolation Resistance			More than 100M Ohm at 25℃ and 70%RH Output - Chassis 500VDC				
Standards	Safety Standards			Approved by UL60950-1, CSA C22.2 No.60950. Built to meet DENAN.				
	EMI			Built to meet FCC class B, VCCI - B				
Mechanical	Weight		g	650				
	Size (W x H x D)		mm	43 x 93 x 170 (Refer to outline drawing)				

(*1) At 100VAC & maximum output power, Ta = 25 ℃.

(*2) For cases where conformance to various safety specs (UL, CSA, VDE) are required to be described as 100-120VAC, 50/60Hz on name plate.

(*3) From 85-132VAC or 110-175VDC, constant load.

(*4) From no load to full load, constant input voltage.

(*5) Current limiting with automatic recovery. (Refer to instruction manual for details.)

(*6) Inverter shutdown method, manual reset.

(*7) Refer to instruction manual for testing procedure.

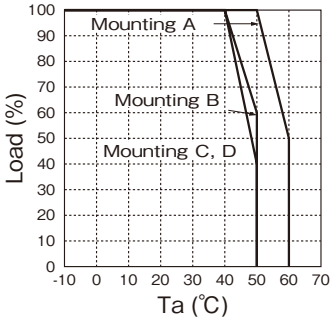
(*8) Ratings - Refer to derating curve on the right.
- Load(%) is percent of maximum output power or maximum output current, whichever is greater.
- Refer to instruction manual for further mounting details.

●Recommended EMC Filter

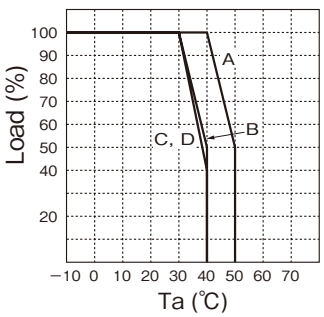
RSEN-2006
Please refer to "TDK-Lambda EMC Filters" catalog.

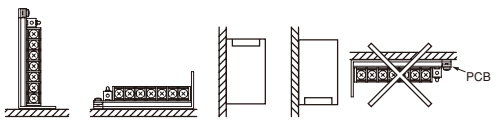
OUTPUT DERATING

Without Cover : Open Frame Type



With cover



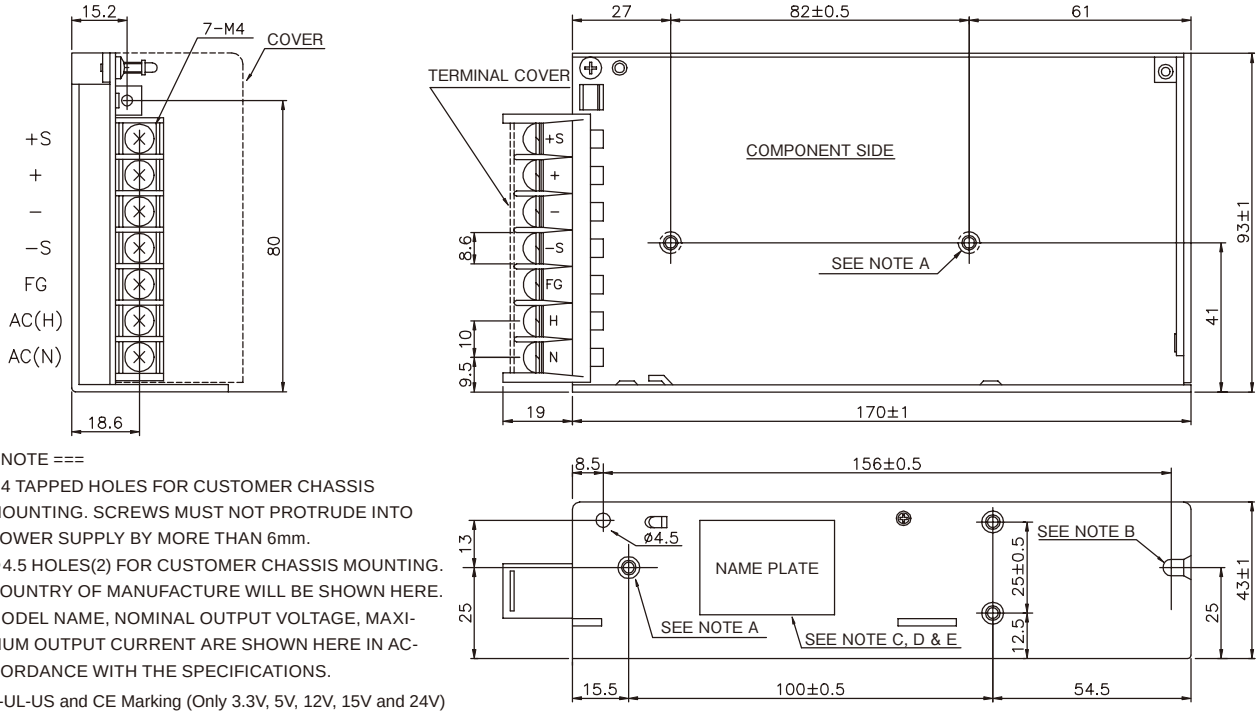


(A) (Standard) (B) (C) (D) (E)Don't use

Recommended standard mounting method is (A). (B), (C), (D) are also possible, but please use within the range of derating. Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.

Outline Drawing

【HK150A】(With screw terminal)



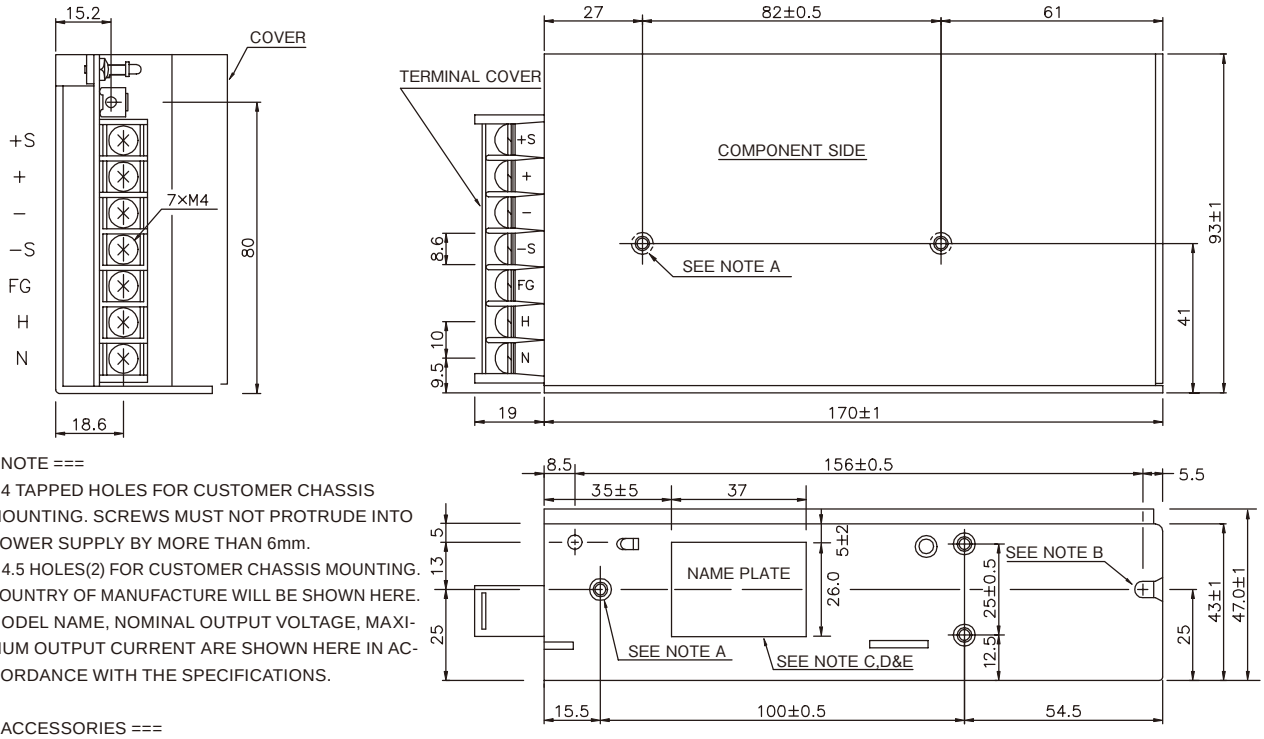
=== NOTE ===
A: M4 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
B: Φ4.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING.
C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
D: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
E: C-UL-US and CE Marking (Only 3.3V, 5V, 12V, 15V and 24V)

(unit: mm)

=== ACCESSORIES ===
COVER FOR BARRIER TERMINAL STRIP --- 1
(MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT)
METAL PIECES FOR SHORTING PURPOSES --- 2 (+～+S & -～-S)
(MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT)

=== MATERIALS ===
Frame: Aluminum
PCB: Composite (CEM-3 UL94V-0) single side

【HK150A/A】(With cover)



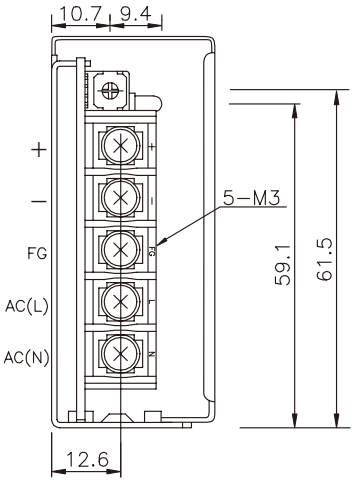
=== NOTE ===
A: M4 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
B: Φ4.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING.
C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
D: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

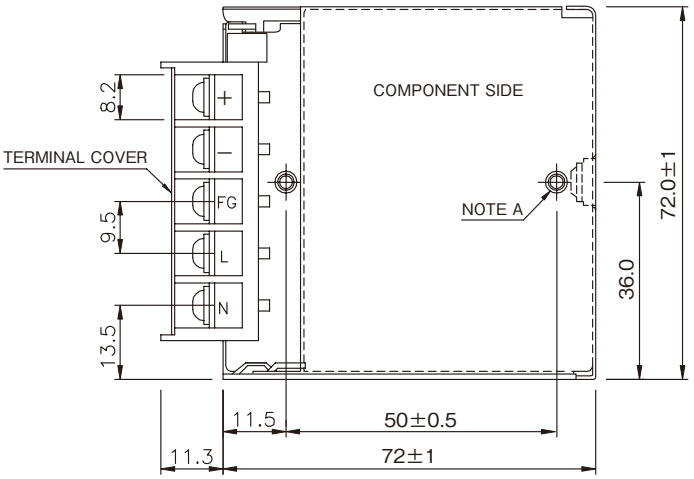
(unit: mm)

=== ACCESSORIES ===
COVER FOR BARRIER TERMINAL STRIP --- 1
(MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT)
METAL PIECES FOR SHORTING PURPOSES --- 2 (+～+S & -～-S)
(MOUNTED ON TERMINAL STRIP AT TIME OF SHIPMENT)

【HK10A/A】

(Screw terminals with cover)





HK-A

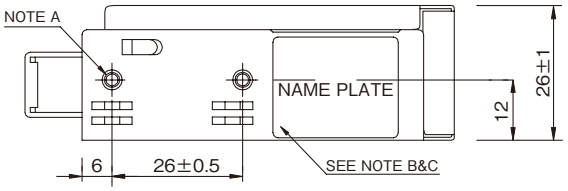
=== NOTES ===

A: M3 tapped holes (4) for customer chassis mounting. (Screws must not protrude into power supply by more than 5mm)

B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

C: Country of manufacturer will be shown here.

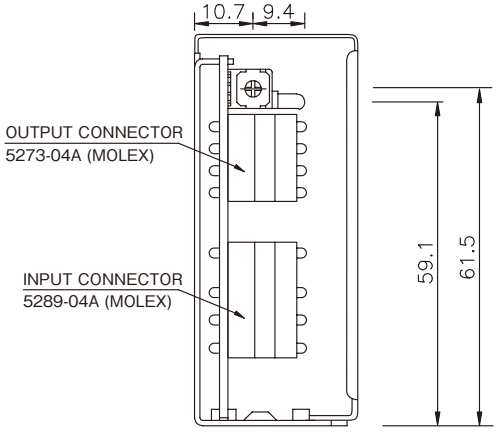
D: C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)

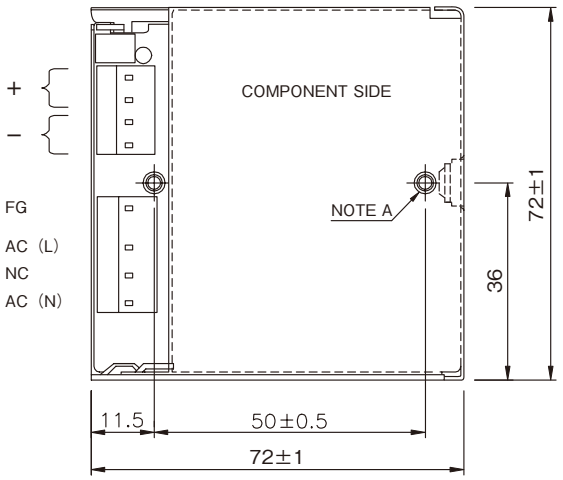


unit: mm

【HK10A/C】

(With connector and cover)





=== NOTES ===

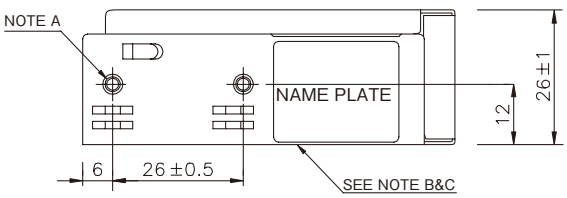
A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)

B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

C: Country of manufacturer will be shown here.

D: Accessories : Housings 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
Terminals 5194PBT (MOLEX) --- NET 7

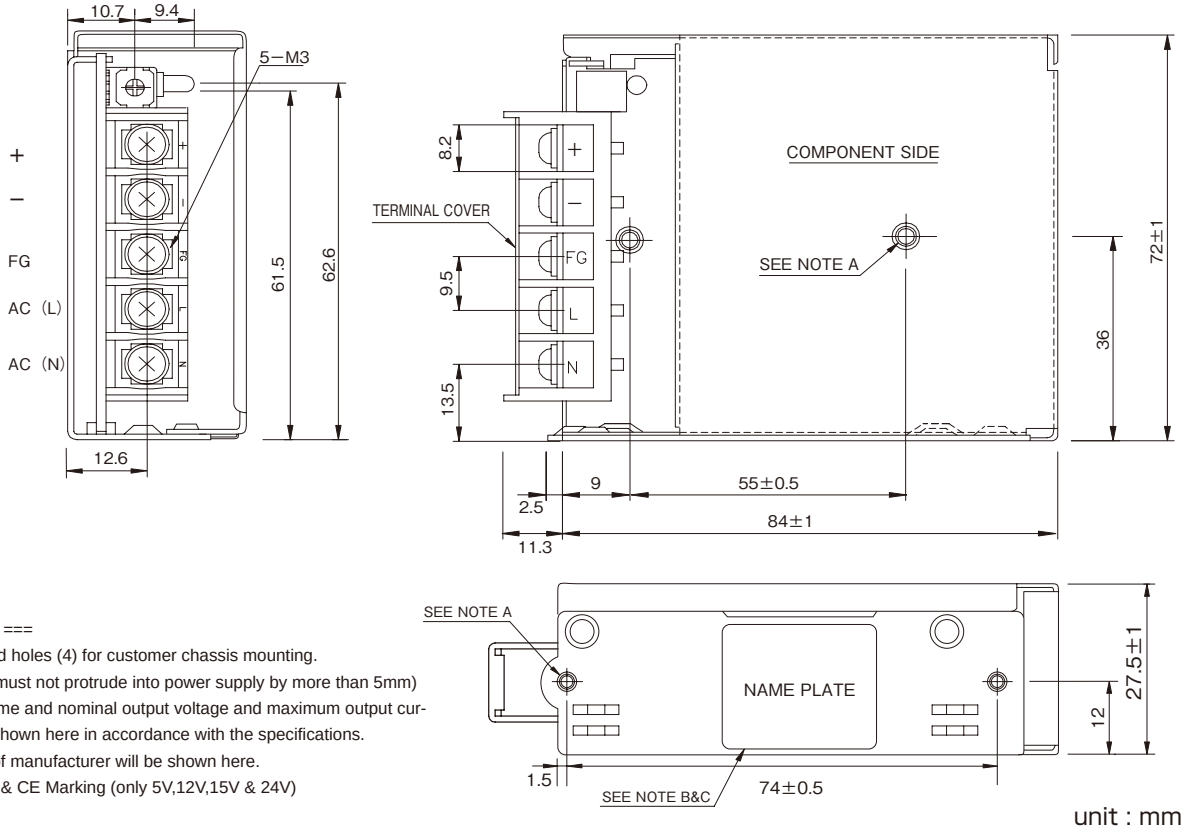
E: C-UL-US & CE Marking (only 5V,12V,15V & 24V)



unit: mm

【HK15A/A】

(Screw terminals with cover)



unit : mm

=== NOTES ===

A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm)

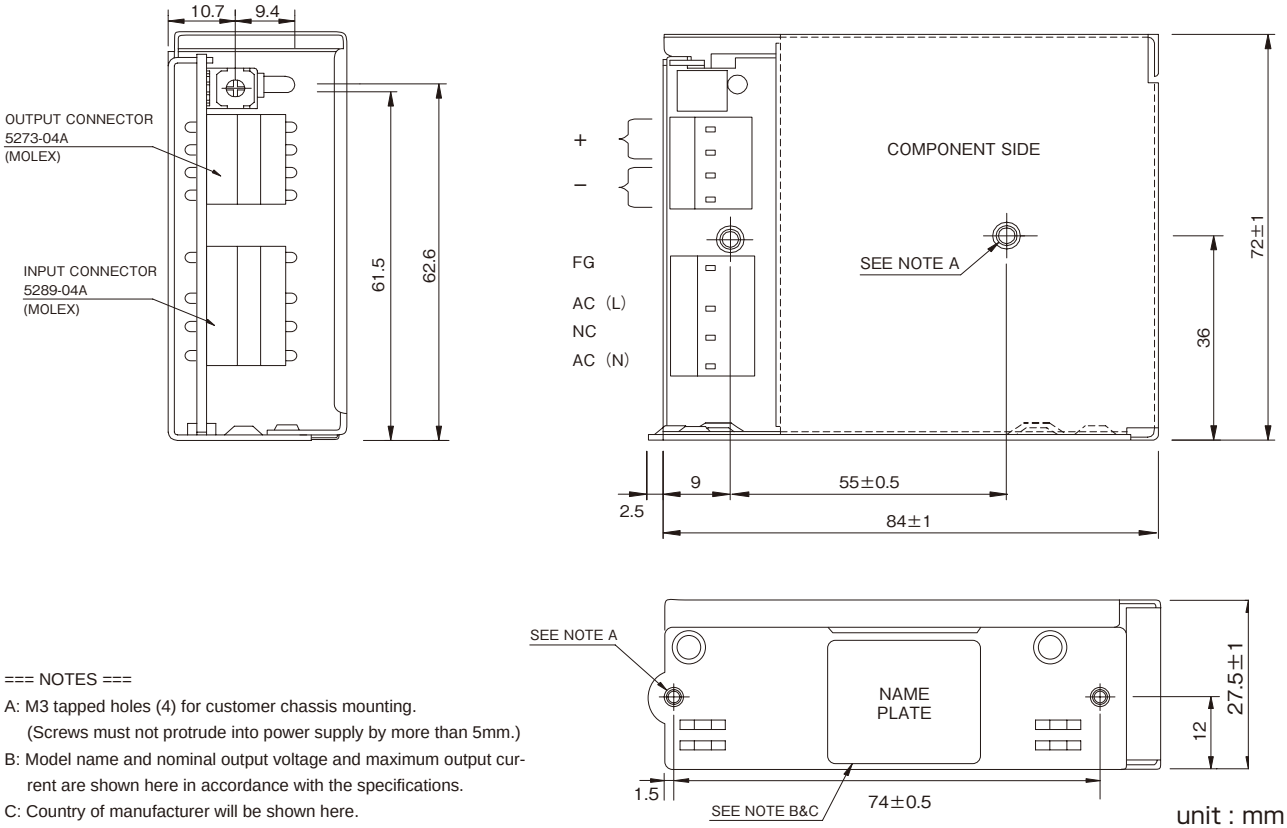
B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

C: Country of manufacturer will be shown here.

D: C-UL-US & CE Marking (only 5V,12V,15V & 24V)

【HK15A/C】

(With connector and cover)



unit : mm

=== NOTES ===

A: M3 tapped holes (4) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)

B: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

C: Country of manufacturer will be shown here.

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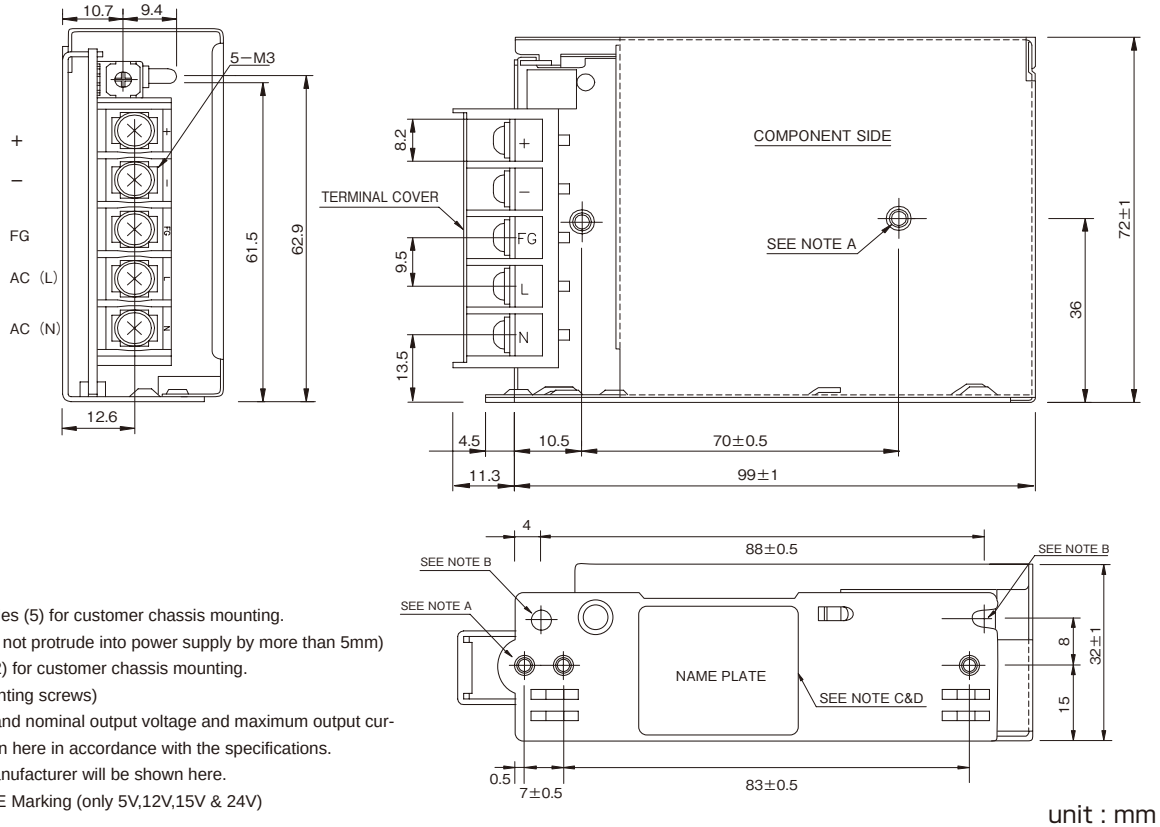
E: ACCESSORIES : HOUSINGS 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

HK-A

【HK25A/A】

(Screw terminals with cover)



=== NOTES ===

A: M3 tapped holes (5) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm)

B: Φ3.5 Holes (2) for customer chassis mounting.
(Use M3 mounting screws)

C: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

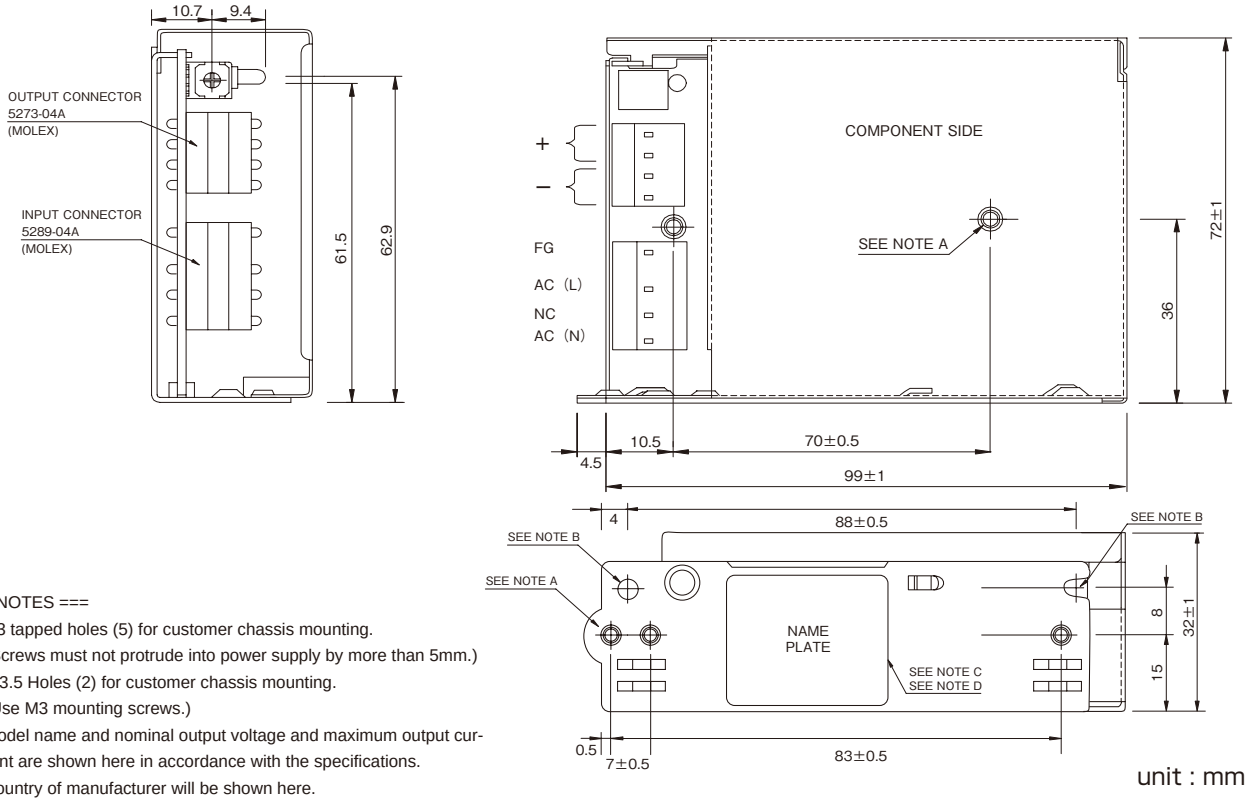
D: Country of manufacturer will be shown here.

E: C-UL-US & CE Marking (only 5V,12V,15V & 24V)

unit : mm

【HK25A/C】

(With connector and cover)



=== NOTES ===

A: M3 tapped holes (5) for customer chassis mounting.
(Screws must not protrude into power supply by more than 5mm.)

B: φ3.5 Holes (2) for customer chassis mounting.
(Use M3 mounting screws.)

C: Model name and nominal output voltage and maximum output current are shown here in accordance with the specifications.

D: Country of manufacturer will be shown here.

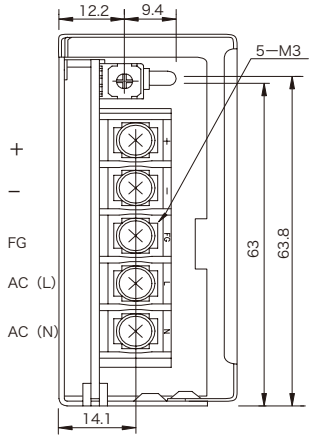
E: ACCESSORIES HOUSING 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

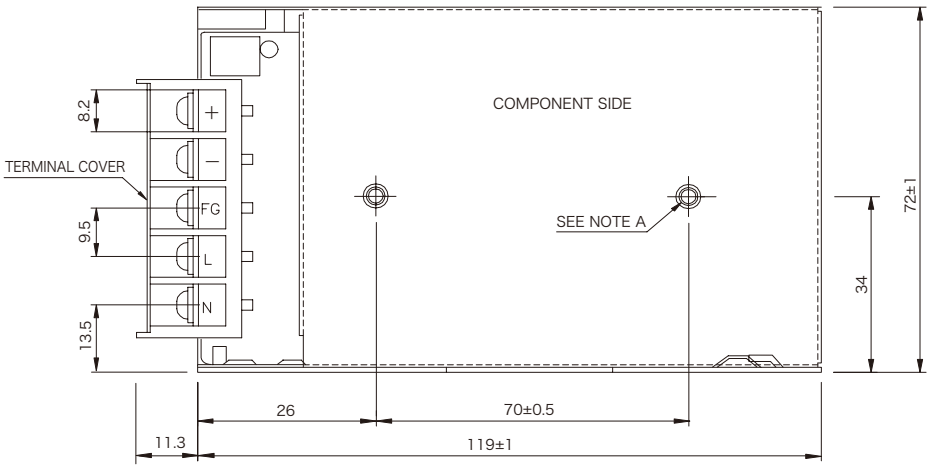
F : C-UL-US & CE Marking (only 5V, 12V, 15V & 24V)

unit : mm

【HK50A/A】

(Screw terminals with cover)





=== NOTE ===

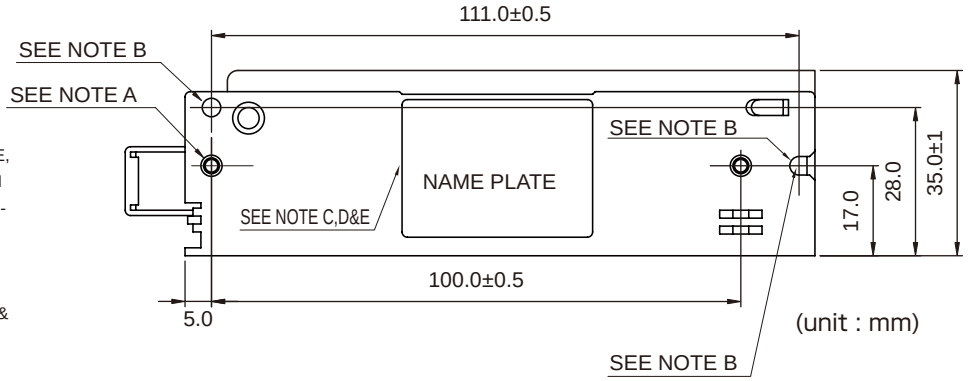
A: M3 TAPPED HOLES(4) FOR CUSTOMER CHASSIS MOUNTING.
(SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 5mm.)

B: φ3.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING.
(USE M3 MOUNTING SCREWS)

C: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

D: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.

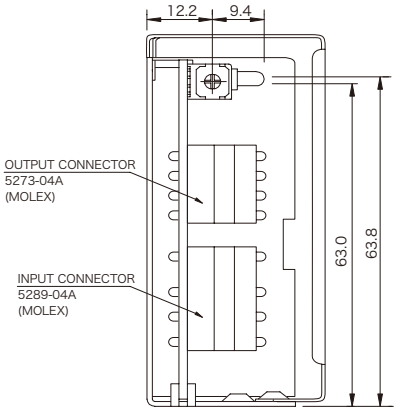
E: C-UL-US & CE MARKING (ONLY 5V,12V,15V & 24V)

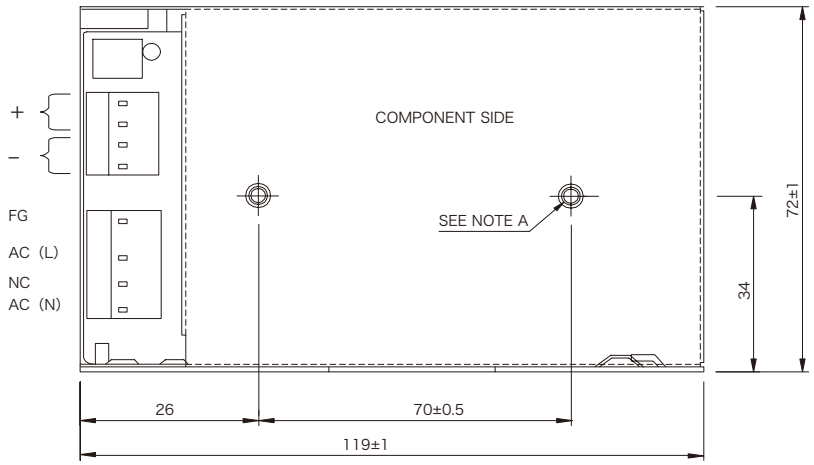


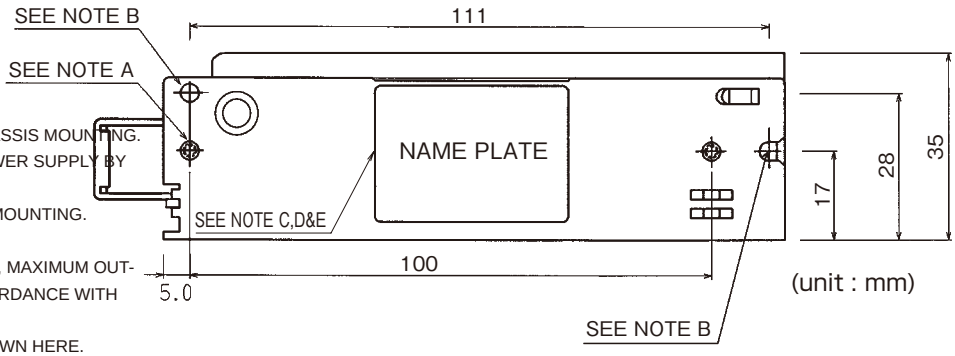
(unit : mm)

【HK50A/C】

(With connector and cover)







(unit : mm)

=== NOTE ===

A: M3 TAPPED HOLES(4) FOR CUSTOMER CHASSIS MOUNTING.
(SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 5mm.)

B: φ3.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING.
(USE M3 MOUNTING SCREWS)

C: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

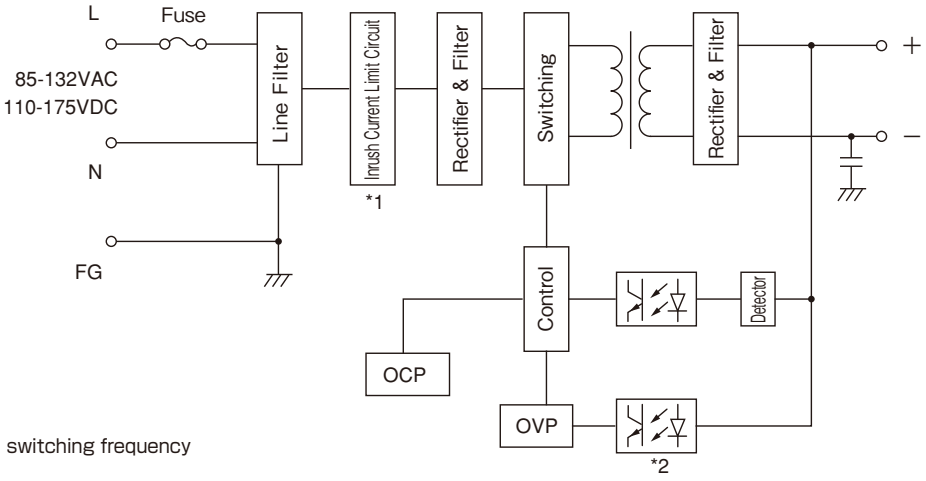
D: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.

E: C-UL-US & CE MARKING (ONLY 5V,12V,15V & 24V)

F: ACCESSORIES : HOUSINGS 5199-04 (MOLEX) --- NET 1
5195-04 (MOLEX) --- NET 1
TERMINALS 5194PBT (MOLEX) --- NET 7

Block Diagram

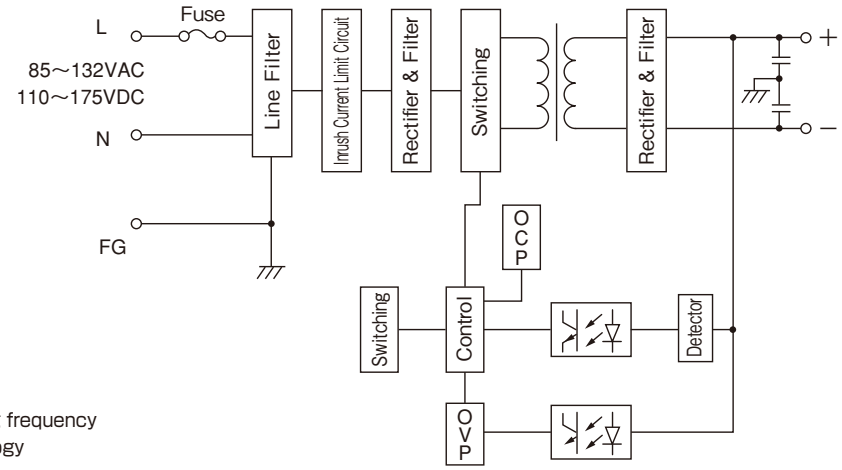
【HK10A, HK15A, HK25A】



● Circuit mode and switching frequency
Flyback topology
HK10A : 500kHz (Full Load), 145kHz (No Load)
HK15A : 600kHz (Full Load), 145kHz (No Load)
HK25A : 200kHz (Full Load), 40kHz (No Load)

● Fuse rating HK10A, 15A : 4A HK25A : 3A
*1 : HK10A and HK15A have no internal fuse.
*2 : HK10A and HK15A adopt over voltage clamping by zener diode.

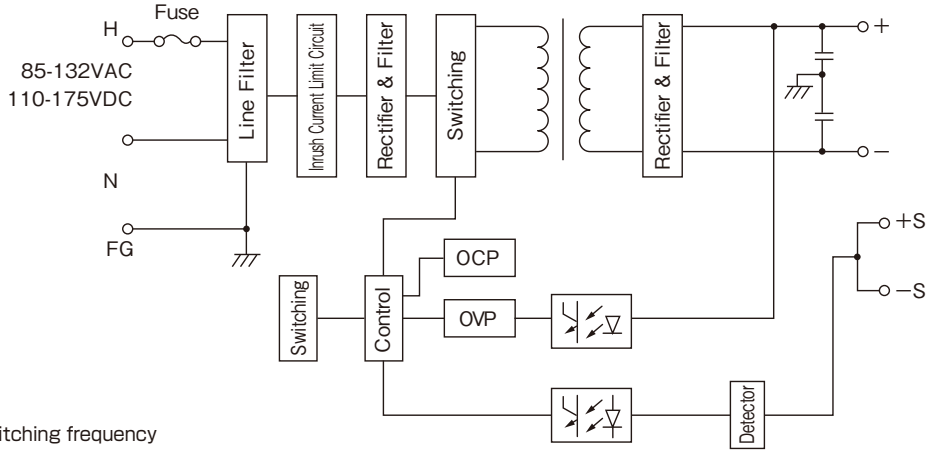
【HK50A】



● Circuit mode and switching frequency
Single-ended forward topology
170kHz (Fixed)

● Fuse rating 4A

【HK100A, HK150A】



● Circuit mode and switching frequency
Single-ended forward topology
200kHz (Fixed)

● Fuse rating HK100A : 5A HK150A : 6.3A

HK-A Series Instruction Manual

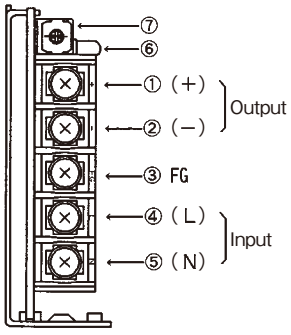
BEFORE USING THE POWER SUPPLY UNIT

- Ensure the wiring to input/output terminals is connected correctly according to this instruction manual.
- Do not turn the output voltage trimmer when not necessary. Output voltage is set to the rated value at shipping.

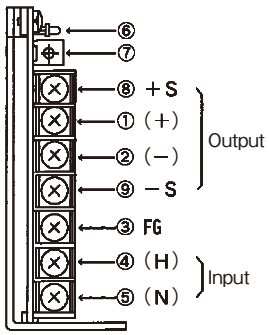
Especially, when the volume in the power supply is set again, original characteristics of the power supply is not obtained.

1. Explanation on Front Panel

HK10A (Same as HK15A, HK25A, HK50A)



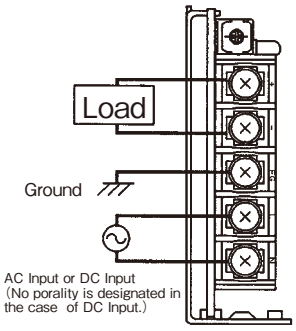
HK100A
(Same as HK150A)



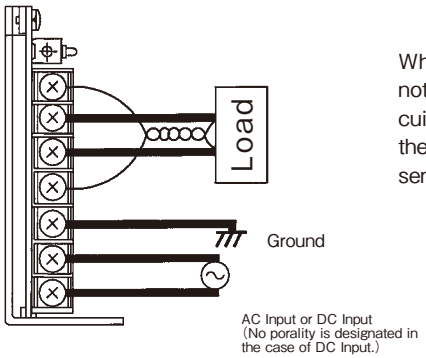
① +OUTPUT TERMINAL
② -OUTPUT TERMINAL
③ FRAME GROUND TERMINAL
④ INPUT TERMINAL(H)
"H": Hot line with a fuse inside a power supply.
⑤ INPUT TERMINAL (N)
"N": Neutral line without fuse.
⑥ OUTPUT VOLTAGE INDICATOR (POWER ON)
This indicator turns on when a power supply's output is normal operating condition.
⑦ OUTPUT ADJUST TRIMMER
The out voltage rises when a trimmer is turned clockwise.
⑧⑨ REMOTE SENSING TERMINALS (+S, -S)
These terminals are for remote sensing function which compensate the line drop (voltage drop by resistance of wire) between power supply terminals and load terminals.

2. Connection (Wiring)

HK10A (Same as HK15A, HK25A, HK50A)



HK100A (Same as HK150A)



When the remote sensing is not required, please short circuit the terminals of +S and + then -S and - with the attached sensing wires.

- Please do not connect 200VAC with input terminals in order to avoid damage of the power supply.
- Please do not turn V.ADJ trimmer except necessary. Especially the V.ADJ trimmer inside the power supply is preset at the time of shipment.
- In the case of HK100A and/or HK150A, please connect remote sensing terminals to avoid working of OVP.

3. Descriptions of Various Functions and Cautions

1 SETTING OF OUTPUT VOLTAGE RANGE

The output voltage range can be set within the range of +/-10% of rated voltage by V.ADJ trimmer. The output voltage rises when this trimmer is turned clockwise. However, please note that the over voltage protection may shut down a power supply, if the output voltage becomes excessively high.

2 Overload Protection (OCP)

The HK-A series are provided with built-in constant over current protective circuit with automatic recovery. Hence, the power supply will automatically recover when the overload condition is cleared. It is not externally adjustable. The short circuit and/or over current conditions continue over 30 seconds, the power supply may be damaged.

3 Over Voltage Protection (OVP)

HK-A series is provided with a built in over voltage protection circuit. Once this over voltage protection circuit shuts down, the output can only be recovered by turning off the input line and reinput the power after the interval time.
(HK10A, HK15A: Zener diode clamp method. When output voltage rises 115% < of nominal output voltage, OVP will operate and shut down the output. If this happens, zener diode must be changed.)

4 Remote Sensing

This function is built only HK100A and HK150A models in. In the case of the line drop (voltage drop) caused by the resistance of wires between output terminals of power supply and the terminals of a load.
If remote sensing is not required, please connect +S terminal with +terminal, and also connect -S terminal with -terminal.
Remote sensing can compensate the line drop within the range of 10% of rated output voltage. Please use a shielded cable or twisted-pair cable for remote sensing.

5 Output Ripple Voltage

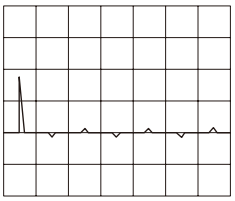
The output ripple voltage is measured at the power supply output terminals, irrespective of whether a load is connected or not. If the load cable is long, connect a capacitor (electrolytic, film, etc.) of sufficient capacity to the load terminals to reduce the impedance. It should be noted that, if the ground lead of the oscilloscope's probe is too long during measurement, the ripple voltage cannot be measured accurately.

6 In-rush Current

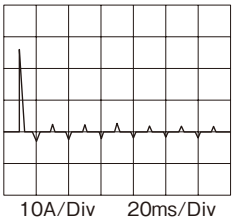
HK-A series is provided built-in in-rush current limiting circuit. Please select an input switch, fuse etc. carefully, when you use multiple power supplies in your system jointly.

IN-RUSH CURRENT WAVE CURVES
(Input: 100VAC, Phase Angle: 90°, Full Load, Ambient Temperature: 25℃)

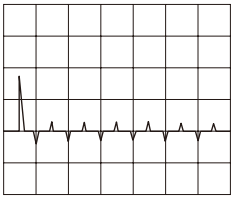
HK10A



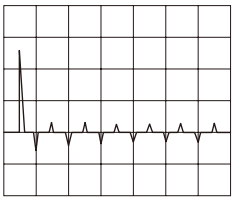
HK15A



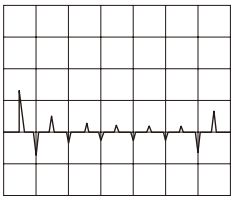
HK25A



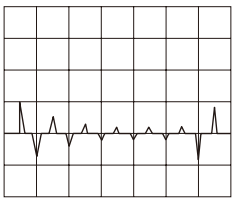
HK50A



HK100A



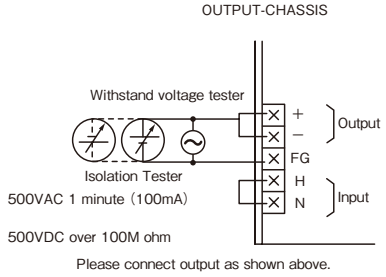
HK150A



4. Insulation Resistance And Withstand Voltage Test

1 Insulation Resistance Test

Please use a DC megger (Max.500V) for measuring the insulation resistance between output terminals and chassis. The resistant figure of HK-A series is 100M ohm at 500VDC.



Please connect output as shown above.

A high voltage pulse may be generated when you change the charging DC value suddenly, therefore, please change the value gradually.
After the test, please discharge a power supply by short-circuiting all output terminals with chassis ground.

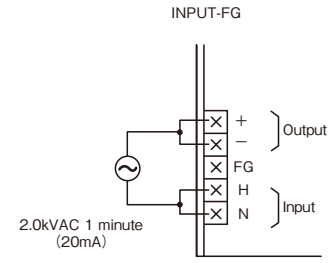
2 Withstand Voltage Test

This Series is designed to withstand 2.0kVAC, 1 minute between input and output terminals.

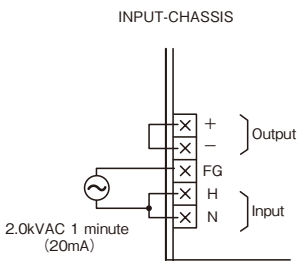
Please set the LIMIT value of a withstand voltage tester at 20mA. The withstand voltage between output terminals and chassis is 500VAC, 1 minute (LIMIT current: 100mA).

When you conduct the test, please elevate or lower the applying voltage gradually. If you suddenly apply the high voltage like 2.0kVA or shudown the applying voltage, many components of a power supply will be damaged and also it is very dangerous for a test operator.

Moreover, please do not use a timer in the test, because the high voltage impulse may be generated and break a power supply unit when a timer shutdown the input power.



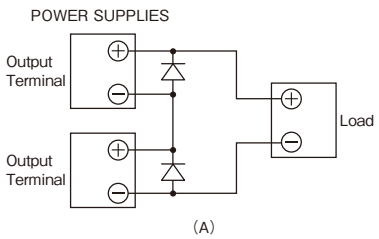
Please connect OUTPUT as shown above.



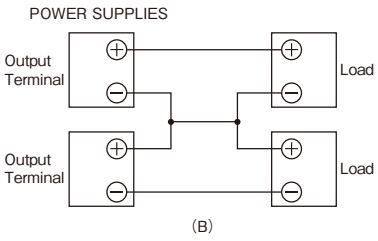
Please connect OUTPUT as shown above.

5. Series & Parallel Operations

Both (A) and (B) method is possible.
In case of (A), please connect diodes to prevent the reverse voltage.
(Refer to the below chart.)
No parallel operation is possible.



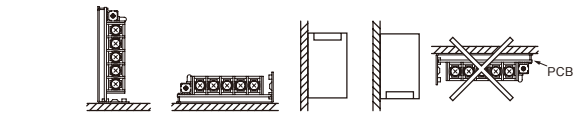
(A)

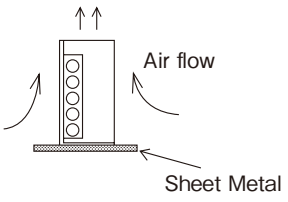


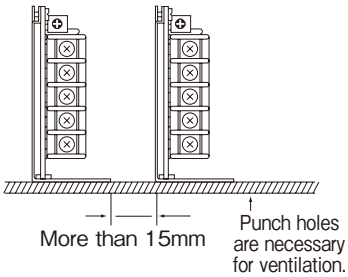
(B)

6. Installation Methods

We recommend the standard installation method of (A). You can install a power supply like (B), (C) and (D). Please do not use (E), where the PCB will be on the top side and heat will be trapped inside the unit.





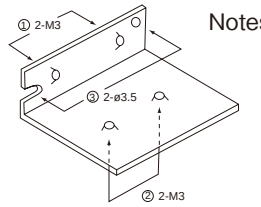


DERATING TABLE BY INSTALLATION METHODS (%)

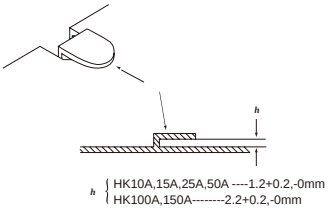
	HK10A				HK15A			
	A	B	C	D	A	B	C	D
30℃	100%	100%	100%	100%	100%	100%	100%	100%
40℃	100%	100%	100%	100%	100%	100%	100%	100%
50℃	100%	100%	50%	50%	100%	100%	50%	50%
60℃	50%	50%	—	—	50%	50%	—	—
70℃	—	—	—	—	—	—	—	—

	HK25A				HK50A			
	A	B	C	D	A	B	C	D
30℃	100%	100%	100%	100%	100%	100%	100%	100%
40℃	100%	100%	100%	100%	100%	100%	100%	100%
50℃	100%	70%	50%	50%	100%	70%	50%	50%
60℃	50%	40%	—	—	50%	40%	—	—
70℃	—	—	—	—	—	—	—	—

	HK100A				HK150A			
	A	B	C	D	A	B	C	D
30℃	100%	100%	100%	100%	100%	100%	100%	100%
40℃	100%	100%	100%	100%	100%	100%	100%	100%
50℃	100%	70%	50%	50%	100%	60%	40%	40%
60℃	50%	40%	—	—	50%	—	—	—
70℃	—	—	—	—	—	—	—	—



Notes: 1. Please keep less than 6m/m of screw into the power supply when mounting. Recommended torque is 5.0kg. cm. (Please use M4 screw for HK100A & HK150A, and the recommended torque is 13.0kg.cm.)
2. In the case of manner (3), please insert to U-cut the power supply and fix by screw.



4. External Fuse Rating

Refer to the following fuse rating when selecting the external fuses that are to be used on input line. Do not use fast-blow fuse.

Fuse Rating

Model	Fuse Rating
HK10A	4A
HK15A	4A
HK25A	3A
HK50A	4A
HK100A	5A
HK150A	6.3A

5. Before concluding that the unit is at fault···

Before concluding that the unit is at fault, make the following checks.

(1) Check if the rated input voltage is connected.
(2) Check if the wiring of input and output are correct.
(3) Check if output voltage, load regulation, and line regulation are measured with the output terminal.
(4) Check if the terminal screw is firmly tightened.
(5) Check if the wire material is not too thin.
(6) Please consult us when using the unit with a large capacitance (over 10,000μF) of capacitors in the load side.

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