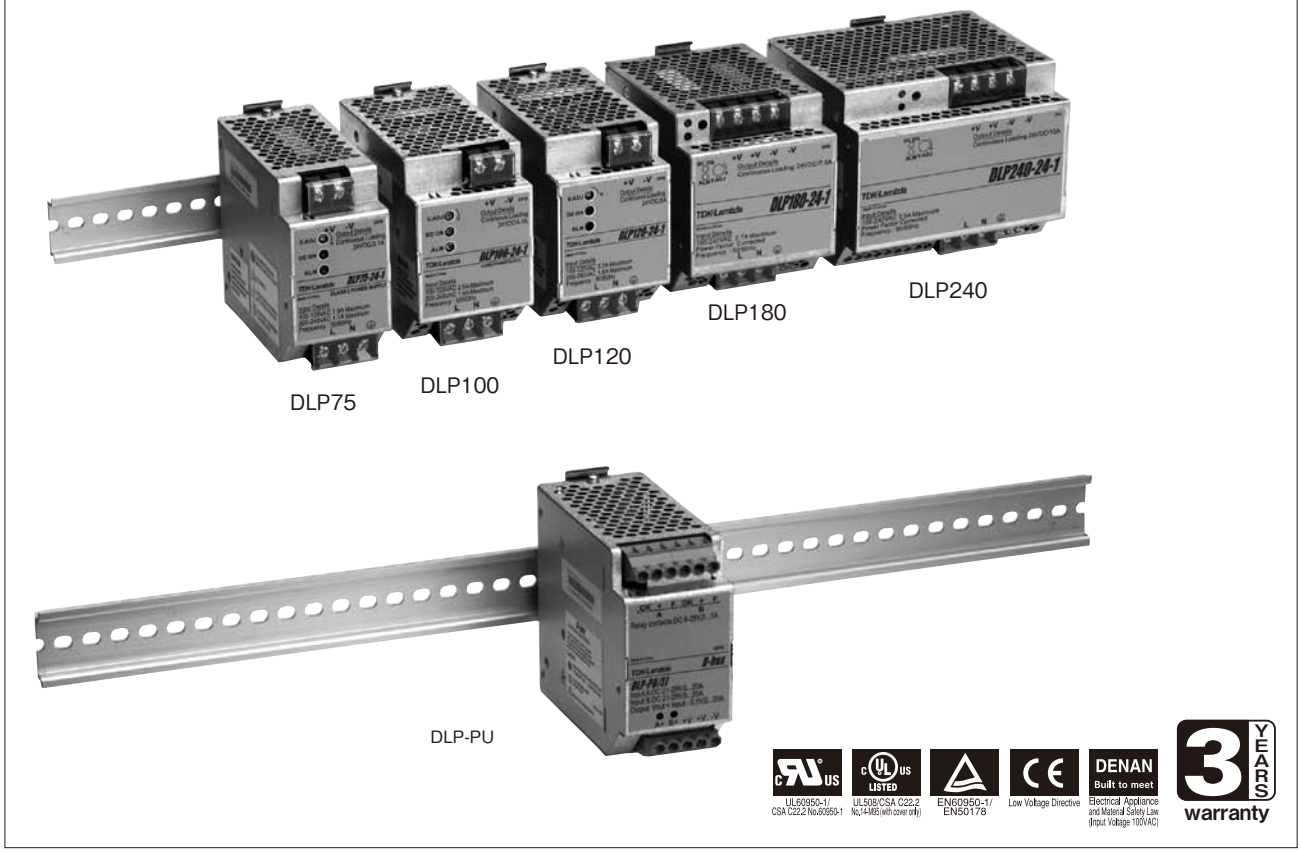
DLP SERIES

Single Output 75W - 240W



■ Features

- DIN Rail mounting
- Alarm (ALM) LED indicator
  Red LED lit in overload or output shorted conditions
- Wide range of operating ambient temperatures
  Operation with full load in -10℃ to +50℃
  DLP75/100/120/180 -- Load: 60% at +60℃
  DLP240 -- Load: 60% at +70℃
- Long hold-up time
  100/230Vin: 20/30 ms
- DLP-PU
  Diode boxes (2 units/maximum load 20A) for backup and parallel operation in DLP series
  Each power supply operation status is indicated by LED, and signals are emitted (relay contact output).

■ Model naming method

DLP 75−24−1/ □

- Blank: Block terminal
  EJ: European terminal
- Single phase input
- Nominal output voltage
- Output power
- Series name

DLP−PU/ EJ

- European terminal
- Series name

■ Applications

F A SEMI

■ 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	75W		100W		120W		180W		240W	
	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model
24V	3.1A	DLP75	4.1A	DLP100	5A	DLP120	7.5A	DLP180	10A	DLP240

DLP75 Specifications

ITEMS/UNITS		MODEL	DLP75-24-1
Input	Voltage Range (*2)	V	AC85 - 132 / 170 - 265 (Auto selectable)
	Frequency (*2)	Hz	47 - 63
	Efficiency (100/230VAC)(typ) (*1)	%	82 / 83
	Current (100/230VAC)(typ) (*1)	A	1.7 / 0.8
	Inrush Current (100/230VAC)(typ) (*3)	A	20 / 45, Ta=25℃, cold start
	Leakage Current (*9)	mA	Less than 0.75
Output	Nominal Voltage	VDC	24
	Maximum Current	A	3.1
	Maximum Power	W	74.4
	Maximum Line Regulation (*4)(*5)	mV	120
	Maximum Load Regulation (*4)(*6)	mV	192
	Temperature Coefficient		Less than 0.05%/℃
	Maximum Ripple & Noise (0≤Ta≤60℃) (*4)	mVp-p	240
	Maximum Ripple & Noise (−10≤Ta<0℃) (*4)	mVp-p	360
	Hold-up Time (100/230VAC) (*1)	ms	20 /30
	Voltage Adjustable Range	VDC	21.6 - 28
Function	Over Current Protection (*7)	A	>3.3
	Over Voltage Protection (*8)	VDC	30.0 - 35.0
	Parallel Operation		-
	Series Operation		Possible
Environment	Operating Temperature (*10)	℃	- 10 to + 60 Convection: -10 to +50 (100%); 60 (60%)
	Storage Temperature	℃	- 30 to +85
	Operating Humidity	%RH	30 - 90 (No dewdrop)
	Storage Humidity	%RH	10 - 95 (No dewdrop)
	Vibration		At no operating and with DIN RAIL, 10～55Hz (sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour
	Shock (In package)		Less than 196m/s²
	Cooling		Convection cooling
Isolation	Withstand Voltage		Input - Output : 3.0kVAC, Input - FG : 2.0kVAC (20mA) for 1min Output - FG : 500VAC (100mA) for 1min.
	Isolation Resistance		More than 100MΩ at Ta=25℃ and 70%RH, Output - FG : 500VDC
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950, EN60950-1, UL508 UL1310, CSA C22.2 No.14-M95, EN50178 CATEGORY III (Primary) Built to meet DENAN.
	PFHC		Built to meet IEC61000-3-2
	EMI		Built to meet VCCI-B, FCC-ClassB, EN55011/EN55022-B
	Immunity		Built to meet IEC61000-6-2 (IEC61000-4-2,-3,-4,-5,-6,-8,-11)
Mechanical	Weight (typ)	g	470
	Size (W x H x D)	mm	50 x 97 x 110 (Refer to outline drawing)

(*1) At 100/230VAC and maximum output power, Ta=25℃ .

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-120VAC/200-240VAC, 50/60Hz on name plate.

(*3) Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

(*4) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(*5) 85-132VAC/170-265VAC, constant load.

(*6) No load - full load (maximum power), constant input voltage.

(*7) Foldback type O.C.P with automatic recovery.
Avoid to operate at overload or dead short for more than 30 seconds.

(*8) OVP circuit will shutdown output, manual reset. (Re Power on)

(*9) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*10) At standard mounting method, Fig B.
- Load(%) is percent of maximum output load (Item2 and 3), do not exceed derating in both maximum output current and power.
- For standard mounting, refer to derating curve.

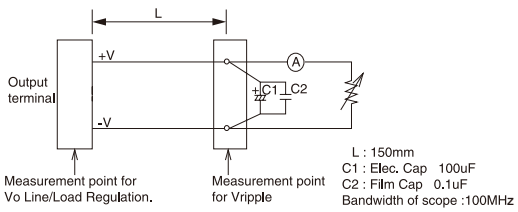


Fig. A

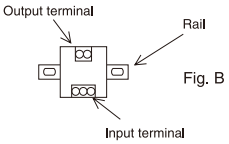


Fig. B

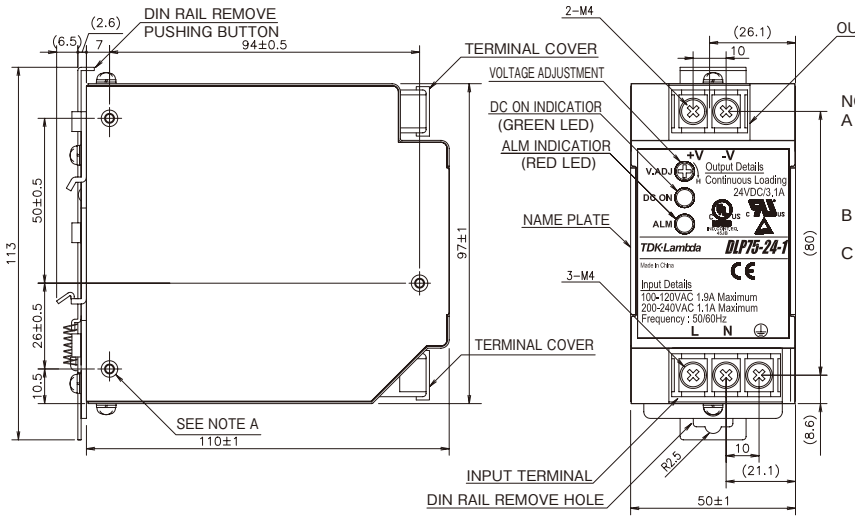
●Recommended EMC Filter

RSEN-2003

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

Outline Drawing

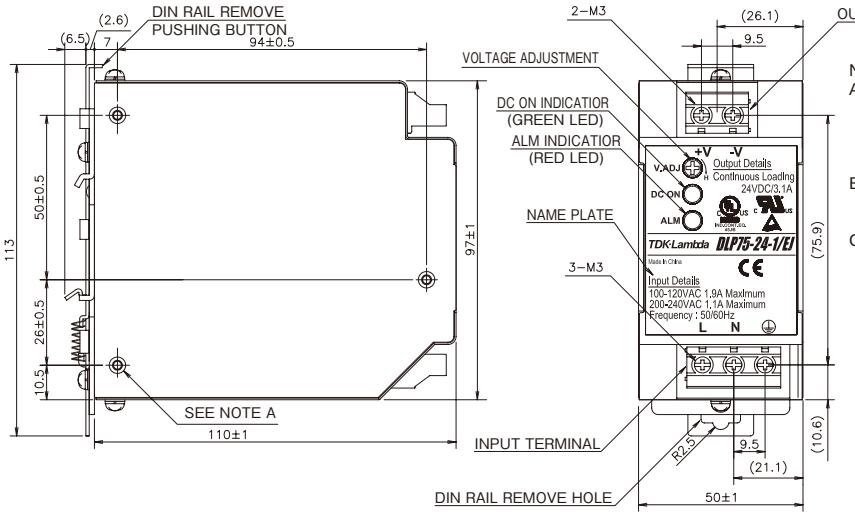
[DLP75] (Block Terminal)



NOTES :
A : M3 EMBOSSED TAPPED & COUNTER-SUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B : RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
C : RECOMMENDED SCREW TORQUE = 1.27N・m

(unit : mm)

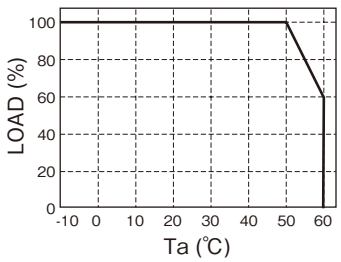
[DLP75/EJ] (European Terminal)

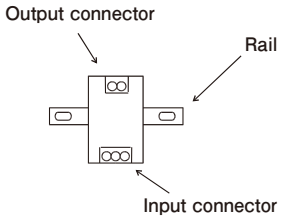


NOTES :
A : M3 EMBOSSED TAPPED & COUNTER-SUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B : RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
WIRE STRIP LENGTH = 6-7mm
C : RECOMMENDED SCREW TORQUE = 0.49N・m

(unit : mm)

Output Derating





STANDARD MOUNTING

DLP100 Specifications

ITEMS/UNITS		MODEL	DLP100-24-1
Input	Voltage Range (*2)	V	AC85-132 / 170-265 (Auto selectable)
	Frequency (*2)	Hz	47-63
	Efficiency (100/230VAC)(typ)(*1)	%	83
	Current (100/230VAC)(typ)(*1)	A	2.5 / 1.1
	Inrush Current (100/230VAC)(typ)(*3)	A	20 / 45, Ta=25°C, cold start
	Leakage Current (*9)	mA	Less than 0.75
Output	Nominal Voltage	VDC	24
	Maximum Current	A	4.1
	Maximum Power	W	98.4
	Maximum Line Regulation (*4)(*5)	mV	120
	Maximum Load Regulation(*4)(*6)	mV	192
	Temperature Coefficient		Less than 0.05%/°C
	Maximum Ripple & Noise (0≤Ta≤60°C) (*4)	mVp-p	240
	Maximum Ripple & Noise (-10≤Ta<0°C) (*4)	mVp-p	360
	Hold-up Time (100/230VAC)(*1)	ms	20 / 30
	Voltage Adjustable Range	VDC	21.6-28
Function	Over Current Protection (*7)	A	4.3-
	Over Voltage Protection (*8)	VDC	30.0-35.0
	Parallel Operation		-
	Series Operation		Possible
Environment	Operating Temperature (*10)	°C	- 10 to + 60 Convection: -10 to +50 (100%); 60 (70%)
	Storage Temperature	°C	- 30 to +85
	Operating Humidity	%RH	30 - 90 (No dewdrop)
	Storage Humidity	%RH	10 - 95 (No dewdrop)
	Vibration		At no operating and with DIN RAIL, 10-55Hz (Sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour
	Shock (In package)		Less than 196m/s²
	Cooling		Convection cooling
Isolation	Withstand Voltage		Input - Output : 3.0kVAC, Input - FG : 2.0kVAC (20mA) for 1min Output - FG : 500VAC (100mA) for 1min.
	Isolation Resistance		More than 100MΩ at Ta=25°C and 70%RH, Output - FG : 500VDC
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950, EN60950-1, UL508, UL1310, CSA C22.2 No.14, EN50178 CATEGORY III (Primary). Built to meet DENAN.
	PFHC		Built to meet IEC61000-3-2
	EMI		Built to meet VCCI-B, FCC-ClassB, EN55011/EN55022-B
	Immunity		Built to meet IEC61000-6-2 (IEC61000-4-2,-3,-4,-5,-6,-8,-11)
Mechanical	Weight (typ)	g	540
	Size (W x H x D)	mm	60 x 97 x 110 (Refer to outline drawing)

(*1) At 100/230VAC and maximum output power, Ta=25°C.

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-120VAC/200-240VAC, 50/60Hz on name plate.

(*3) Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

(*4) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(*5) 85-132VAC/170-265VAC, constant load.

(*6) No load - Full load (maximum power), constant input voltage.

(*7) Constant current limit with automatic recovery.
Avoid to operate at overload or dead short for more than 30 seconds.

(*8) OVP circuit will shutdown output, manual reset. (Re Power on)

(*9) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*10) At standard mounting method, Fig B.
- Load(%) is percent of maximum output load (Item2 and 3), do not exceed derating in both maximum output current and power.
- For standard mounting, refer to derating curve.

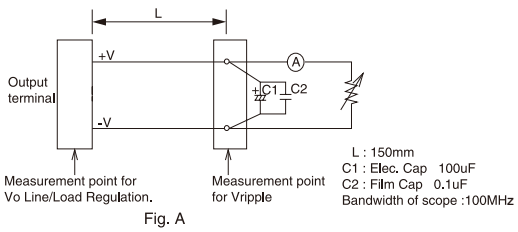


Fig. A

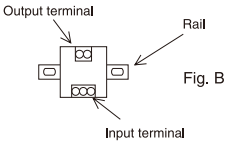


Fig. B

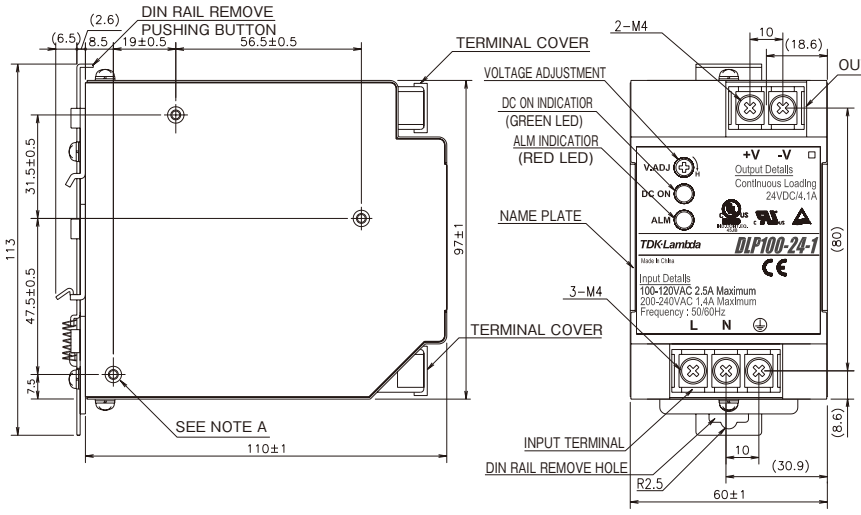
●Recommended EMC Filter

RSEN-2006

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

Outline Drawing

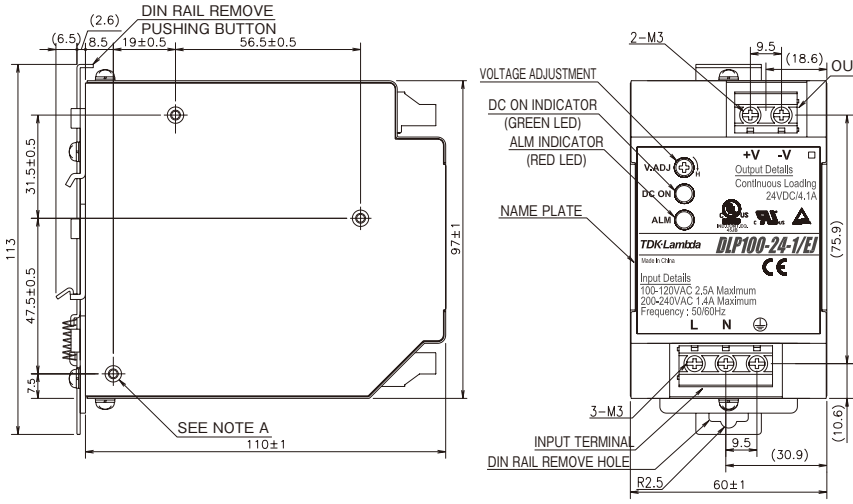
【DLP100】(Block Terminal)



NOTES :
A : M3 EMBOSSED TAPPED & COUNTERSUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B : RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
C : RECOMMENDED SCREW TORQUE = 1.27N·m

(unit : mm)

【DLP100/EJ】(European Terminal)

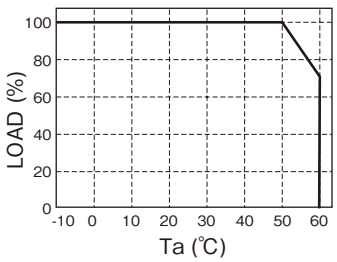


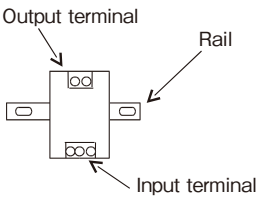
NOTES :
A : M3 EMBOSSED TAPPED & COUNTERSUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B : RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2) WIRE STRIP LENGTH = 6-7mm
C : RECOMMENDED SCREW TORQUE = 0.49N·m

(unit : mm)

Output Derating

OUTPUT DERATING CURVE





STANDARD MOUNTING

DLP120 Specifications

ITEMS/UNITS \ MODEL			DLP120-24-1
Input	Voltage Range (*2)	V	AC85-132 / 170 - 265 (Auto selectable)
	Frequency (*2)	Hz	47 - 63
	Efficiency (100/230VAC)(typ) (*1)	%	83 / 85
	Current (100/230VAC)(typ) (*1)	A	2.9 / 1.3
	Inrush Current (100/230VAC)(typ) (*3)	A	20 / 45, Ta=25℃, cold start
	Leakage Current (*9)	mA	Less than 0.75
Output	Nominal Voltage	VDC	24
	Maximum Current	A	5
	Maximum Power	W	120
	Maximum Line Regulation(*4)(*5)	mV	120
	Maximum Load Regulation(*4)(*6)	mV	192
	Temperature Coefficient		Less than 0.05%/℃
	Maximum Ripple & Noise (0≤Ta≤60℃)(*4)	mVp-p	240
	Maximum Ripple & Noise (-10≤Ta<0℃)(*4)	mVp-p	360
	Hold-up Time (100/230VAC)(*1)	ms	20 / 30
	Voltage Adjustable Range	VDC	21.6 - 28
Function	Over Current Protection (*7)	A	>5.3
	Over Voltage Protection (*8)	VDC	30.0 - 35.0
	Parallel Operation		-
	Series Operation		Possible
Environment	Operating Temperature (*10)	℃	- 10 to + 60 Convection: -10 to +50 (100%); 60 (60%)
	Storage Temperature	℃	- 30 to +85
	Operating Humidity	%RH	30 - 90 (No dewdrop)
	Storage Humidity	%RH	10 - 95 (No dewdrop)
	Vibration		At no operating and with DIN RAIL, 10-55Hz (sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour
	Shock (In package)		Less than 196m/s²
	Cooling		Convection cooling
Isolation	Withstand Voltage		Input - Output : 3.0kVAC, Input - FG : 2.0kVAC (20mA) for 1min Output - FG : 500VAC (100mA) for 1min.
	Isolation Resistance		More than 100MΩ at Ta=25℃ and 70%RH, Output - FG : 500VDC
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950, EN60950-1, UL508, CSA C22.2 No.14-M95, EN50178 CATEGORY III (Primary). Built to meet DENAN.
	PFHC		Built to meet IEC61000-3-2
	EMI		Built to meet VCCI-B, FCC-ClassB, EN55011/EN55022-B
	Immunity		Built to meet IEC61000-6-2 (IEC61000-4-2,-3,-4,-5,-6,-8,-11)
Mechanical	Weight (typ)	g	540
	Size (W x H x D)	mm	60x97x110 (Refer to Outline Drawing)

(*1) At 100/230VAC and maximum output power, Ta=25℃ .

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-120VAC/200-240VAC, 50/60Hz on name plate.

(*3) Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

(*4) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(*5) 85-132VAC/170-265VAC, constant load.

(*6) No load - full load (maximum power), constant input voltage.

(*7) Constant current limit with automatic recovery.
Avoid to operate at overload or dead short for more than 30seconds.

(*8) OVP circuit will shutdown output, manual reset. (Re Power on)

(*9) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*10) At standard mounting method, Fig B.
- Load(%) is percent of maximum output load (Item2 and 3), do not exceed derating in both maximum output current and power.
- For standard mounting, refer to derating curve.

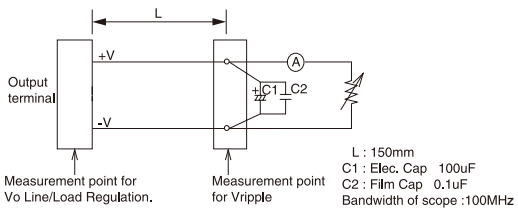


Fig. A

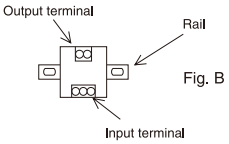


Fig. B

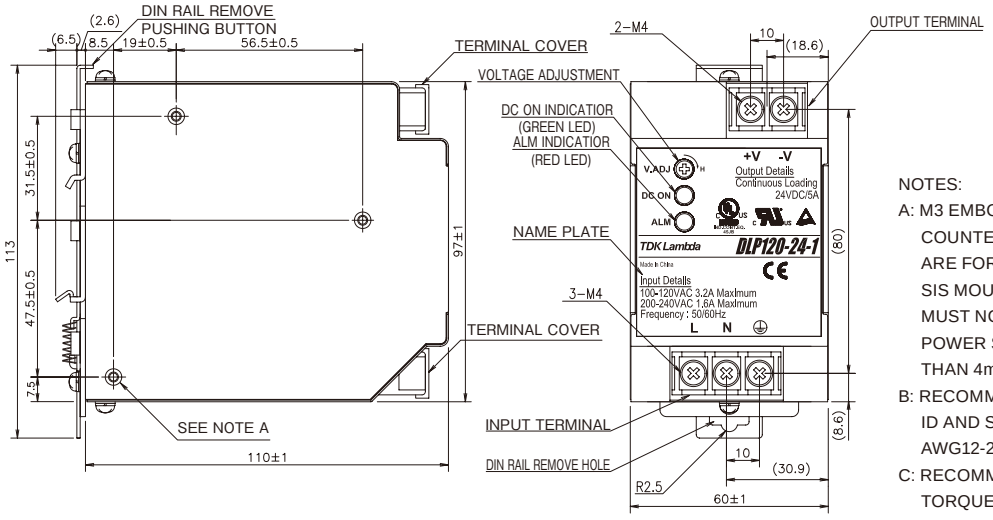
●Recommended EMC Filter

RSEN-2006

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

Outline Drawing

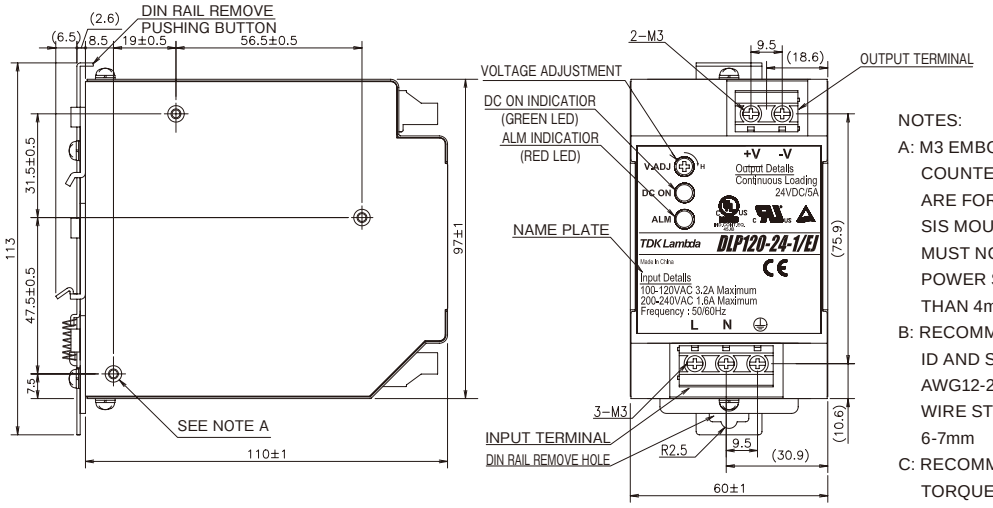
【DLP120】(Block Terminal)



NOTES:
A: M3 EMBOSSED TAPPED & COUNTERSUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm²)
C: RECOMMENDED SCREW TORQUE = 1.27N·m

(unit : mm)

【DLP120/EJ】(European Terminal)

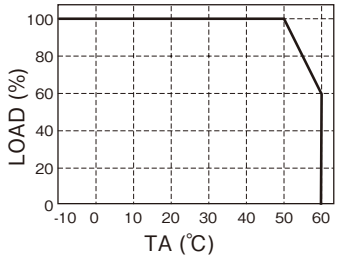


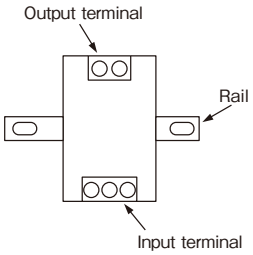
NOTES:
A: M3 EMBOSSED TAPPED & COUNTERSUNK HOLES (3) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm²) WIRE STRIP LENGTH = 6-7mm
C: RECOMMENDED SCREW TORQUE = 0.49N·m

(unit : mm)

Output Derating

OUTPUT DERATING CURVE





STANDARD MOUNTING

DLP180 Specifications

ITEMS/UNITS		MODEL	DLP180-24-1
Input	Voltage Range (*2)	V	AC85 - 265 or DC120 - 370
	Frequency (*2)	Hz	47-63
	Power Factor (typ) (*1)		0.99 / 0.95
	Efficiency (100/230VAC)(typ) (*1)	%	84 / 87
	Current (100/230VAC)(typ) (*1)	A	2.3 / 1.0
	Inrush Current (100/230VAC)(typ) (*3)	A	20 / 45, Ta=25℃, cold start
	Leakage Current (*9)	mA	Less than 0.75
Output	Nominal Voltage	VDC	24
	Maximum Current	A	7.5
	Maximum Power	W	180
	Maximum Line Regulation (*4)(*5)	mV	120
	Maximum Load Regulation (*4)(*6)	mV	192
	Temperature Coefficient		Less than 0.05%/℃
	Maximum Ripple & Noise (0≤Ta≤60℃) (*4)	mVp-p	240
	Maximum Ripple & Noise (−10≤Ta<0℃) (*4)	mVp-p	360
	Hold-up Time (100/230VAC) (*1)	ms	20 / 30
	Voltage Adjustable Range	VDC	21.6 - 28
Function	Over Current Protection (*7)	A	>7.9
	Over Voltage Protection (*8)	VDC	30.0 - 35.0
	Parallel Operation		-
	Series Operation		Possible
Environment	Operating Temperature (*10)	℃	- 10 to + 60 Convection: -10 to +50 (100%); 60 (60%)
	Storage Temperature	℃	- 30 to +85
	Operating Humidity	%RH	30 - 90 (No dewdrop)
	Storage Humidity	%RH	10 - 95 (No dewdrop)
	Vibration		At no operating and with DIN RAIL, 10～55Hz (sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour
	Shock (In package)		Less than 196m/s²
	Cooling		Convection cooling
Isolation	Withstand Voltage		Input - Output : 3.0kVAC, Input - FG : 2.0kVAC (20mA) for 1min Output - FG : 500VAC (100mA) for 1min.
	Isolation Resistance		More than 100MΩ at Ta=25℃ and 70%RH, Output - FG : 500VDC
Standards	Safety Standards		Approved by UL60950-1,CSA C22.2 No.60950, EN60950-1, UL508, CSA C22.2 No14-M95, EN50178 CATEGORY III (Primary), Built to meet DENAN
	PFHC		Built to meet IEC61000-3-2
	EMI		Built to meet VCCI-B, FCC-ClassB, EN55011/EN55022-B
	Immunity		Built to meet IEC61000-6-2 (IEC61000-4-2,-3,-4,-5,-6,-8,-11)
Mechanical	Weight (typ)	g	780
	Size (W x H x D)	mm	80 x 97 x 110 (Refer to outline drawing)

(*1) At 100/230VAC and maximum output power, Ta=25℃ .

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-240VAC, 50/60Hz on name plate.

(*3) Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

(*4) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(*5) 85-265VAC, constant load.

(*6) No load - full load (maximum power), constant input voltage.

(*7) Constant current limit with automatic recovery.
Avoid to operate at overload or dead short for more than 30 seconds.

(*8) OVP circuit will shutdown output, manual reset. (Re power on.)

(*9) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*10) At standard mounting method, Fig B.
- Load(%) is percent of maximum output load (Item2 and 3), do not exceed derating in both maximum output current and power.
- For standard mounting, refer to derating curve.

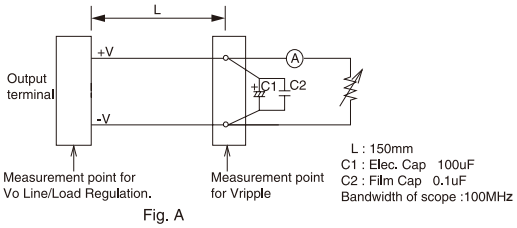


Fig. A

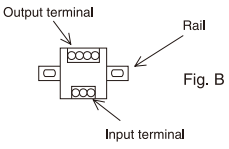


Fig. B

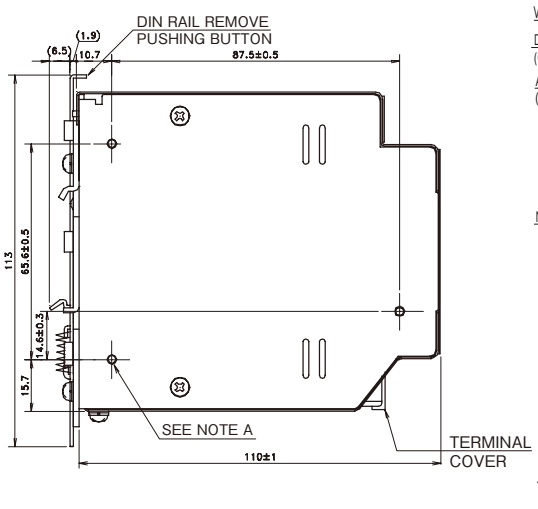
●Recommended EMC Filter

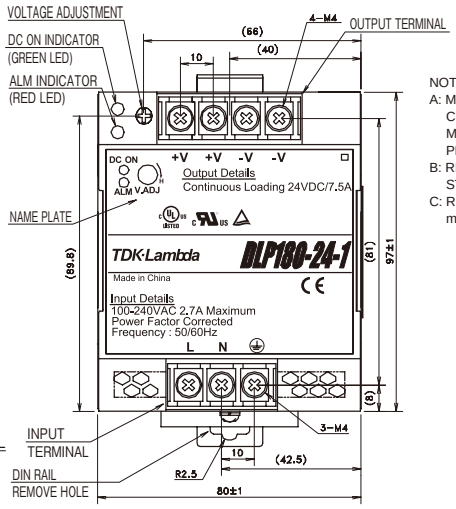
RSEN-2006

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

Outline Drawing

【DLP180】(Block Terminal)

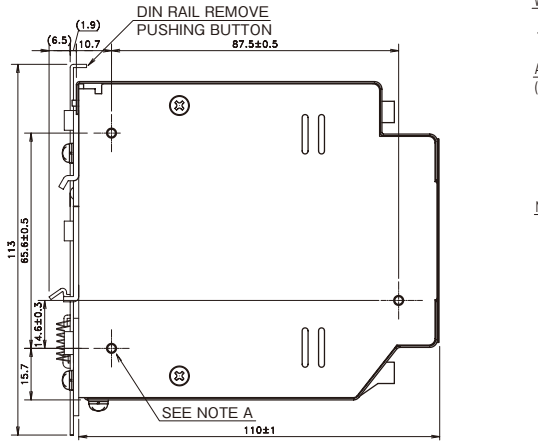


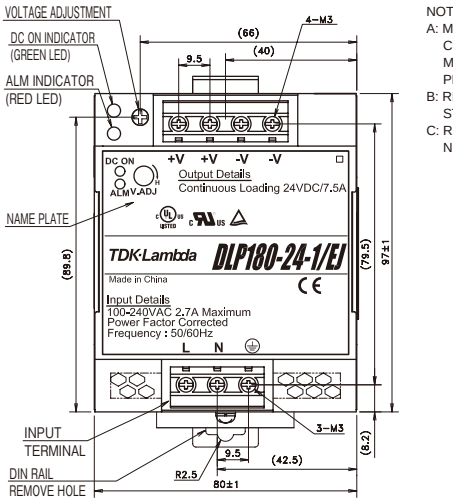


NOTES:
A: M3 EMBOSSED TAPPED HOLES(6) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
C: RECOMMENDED SCREW TORQUE = 1.27N·m

(unit : mm)

【DLP180/EJ】(European Terminal)



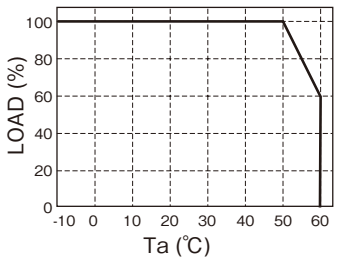


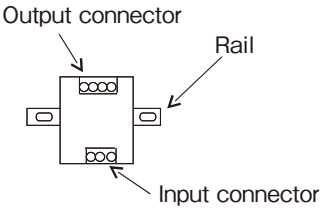
NOTES:
A: M3 EMBOSSED TAPPED HOLES(6) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
C: RECOMMENDED SCREW TORQUE = 1.27 N·m

(unit : mm)

Output Derating

OUTPUT DERATING CURVE





STANDARD MOUNTING

DLP240 Specifications

ITEMS/UNITS		MODEL	DLP240-24-1
Input	Voltage Range (*2)	V	AC85 - 265 or DC120 - 370
	Frequency (*2)	Hz	47-63
	Power Factor (typ) (*1)		0.99 / 0.95
	Efficiency (100/230VAC)(typ) (*1)	%	82 / 86
	Current (100/230VAC)(typ) (*1)	A	3.0 / 1.3
	Inrush Current (100/230VAC)(typ) (*3)	A	20 / 45, Ta=25℃, cold start
	Leakage Current (*9)	mA	Less than 0.75
Output	Nominal Voltage	VDC	24
	Maximum Current	A	10
	Maximum Power	W	240
	Maximum Line Regulation (*4)(*5)	mV	120
	Maximum Load Regulation (*4)(*6)	mV	192
	Temperature Coefficient		Less than 0.05%/℃
	Maximum Ripple & Noise (0≤Ta≤60℃) (*4)	mVp-p	240
	Maximum Ripple & Noise (−10≤Ta<0℃) (*4)	mVp-p	360
	Hold-up Time (100/230VAC) (*1)	ms	20 / 30
	Voltage Adjustable Range	VDC	21.6 - 28
Function	Over Current Protection (*7)	A	>10.5
	Over Voltage Protection (*8)	V	30.0 - 35.0
	Parallel Operation		-
	Series Operation		Possible
Environment	Operating Temperature (*10)	℃	85VAC - 170VAC : -10 to +60, Convection: -10 to +50 (100%); 60 (60%) 170VAC - 265VAC : -10 to +70, Convection: -10 to +55 (100%); 70 (60%)
	Storage Temperature	℃	- 30 to +85
	Operating Humidity	%RH	30 - 90 (No dewdrop)
	Storage Humidity	%RH	10 - 95 (No dewdrop)
	Vibration		At no operating and with DIN RAIL 10～55Hz (sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour
	Shock (In package)		Less than 196m/s²
	Cooling		Convection cooling
Isolation	Withstand Voltage		Input - Output : 3.0kVAC, Input - FG : 2.0kVAC (20mA) for 1min Output - FG : 500VAC (100mA) for 1min.
	Isolation Resistance		More than 100MΩ at Ta=25℃ and 70%RH, Output - FG : 500VDC
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950, EN60950-1, UL508, CSA C22.2 No.14-M95, EN50178 CATEGORY III (Primary), Built to meet DENAN
	PFHC		Built to meet IEC61000-3-2
	EMI		Built to meet VCCI-B, FCC-ClassB, EN55011/EN55022-B
	Immunity		Built to meet IEC61000-6-2 (IEC61000-4-2,-3,-4,-5,-6,-8,-11)
Mechanical	Weight (typ)	g	1000
	Size (W x H x D)	mm	120 x 97 x 110 (Refer to outline drawing)

(*1) At 100/230VAC and maximum output power, Ta=25℃ .

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-240VAC, 50/60Hz on name plate.

(*3) Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

(*4) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(*5) 85-265VAC, constant load.

(*6) No load - full load (maximum power), constant input voltage.

(*7) Constant current limit with automatic recovery.
Avoid to operate at overload or dead short for more than 30 seconds.

(*8) OVP circuit will shutdown output, manual reset. (Re power on.)

(*9) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*10) At standard mounting method, Fig B.
- Load(%) is percent of maximum output load (Item2 and 3), do not exceed derating in both maximum output current and power.
- For standard mounting, refer to derating curve.

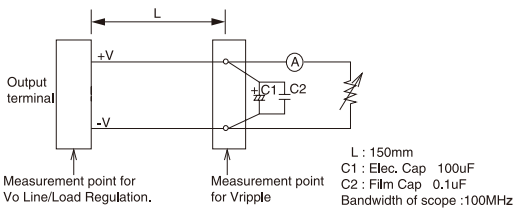


Fig. A

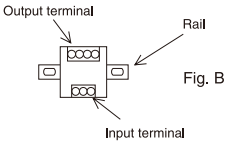


Fig. B

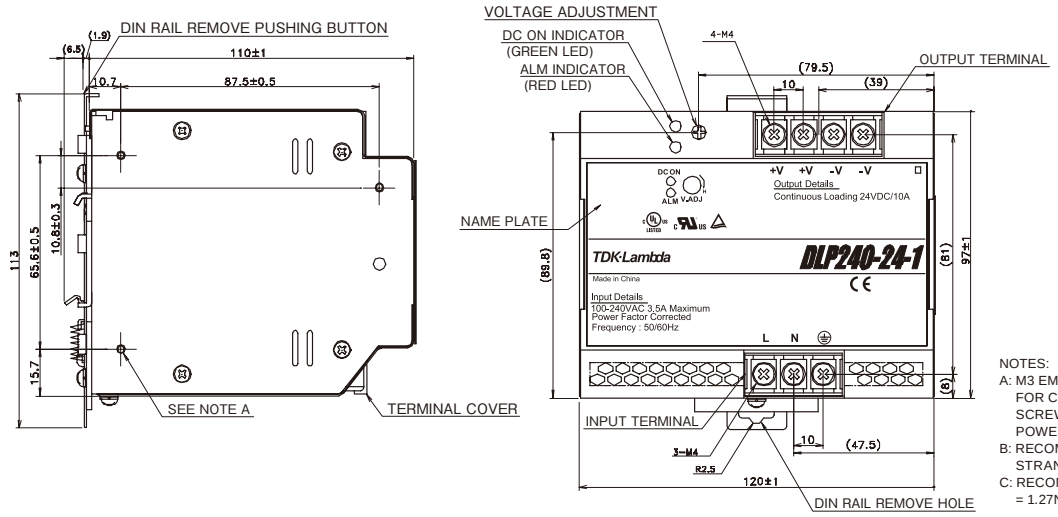
●Recommended EMC Filter

RSEN-2006

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

Outline Drawing

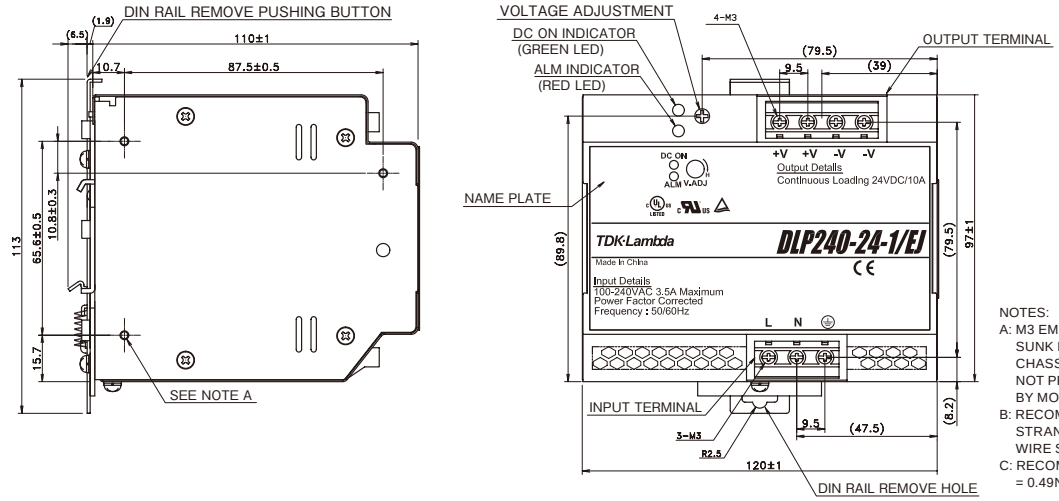
【DLP240】(Block Terminal)



NOTES:
A: M3 EMBOSSED TAPPED HOLES(6) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2)
C: RECOMMENDED SCREW TORQUE = 1.27N·m

(unit : mm)

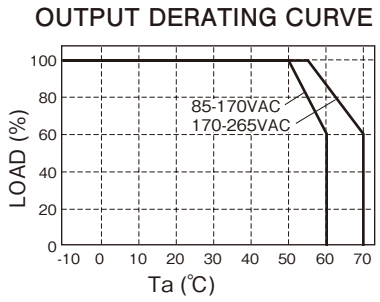
【DLP240/EJ】(European Terminal)

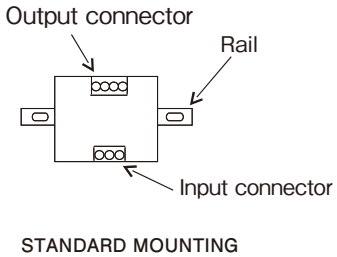


NOTES:
A: M3 EMBOSSED TAPPED & COUNTER-SUNK HOLES(6) ARE FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED AWG12-20 (0.5-3.5mm^2) WIRE STRIP LENGTH = 6-7mm
C: RECOMMENDED SCREW TORQUE = 0.49N·m

(unit : mm)

Output Derating





STANDARD MOUNTING

DLP-PU Specifications

ITEMS/UNITS \ MODEL			DLP-PU/EJ	
Input	Nominal Voltage	V	DC24	
	Voltage Range	V	DC21-28	
	Efficiency (typ) (*1)	%	97	
	Current (nominal)	A	20 (A, B total)	
Output	Maximum Current	A	20	
Function	Over Current Protection	A	None	
	Over Voltage Protection	VDC	None	
	Input Voltage Monitor Indicator		A,B Individual Monitor Green LED	
	Input Voltage Monitor Alarm		Relay Contact (at nominal input voltage: Contact + to OK)	
	Low Input Voltage Alarm Level(*3)		19.2V±1%	Less than low level or more than high level:
	High Input Voltage Alarm Level(*4)		30V±5%	Contact + to F (Discontact + to OK)
	Input Number		2 (A, B)	
	Voltage Drop (typ) (*2)	V	DC0.5	
	Maximum Reverse Output Voltage	V	DC35	
	Relay Contacts Ratings		Maximum : 28VDC , 1A; 120VAC, 0.5A Minimum : DC 1mA (5mA or more recommended)	
Environment	Operating Temperature (*5)	℃	- 10 to +70 Convection: -10 to +60 (100%); 70 (60%)	
	Storage Temperature	℃	-30 to +85	
	Operating Humidity	%RH	30-90 (No dewdrop)	
	Storage Humidity	%RH	10-95 (No dewdrop)	
	Vibration		At no operating and with DIN rail, 10-55Hz (sweep for 1min) 9.8m/s² constant, X, Y, Z each 1hour	
	Shock		196m/s² (20G)	
	Cooling		Convection cooling	
Isolation	Withstand Voltage		Input,Output - FG; Input, Output - Relay Contact; Relay Contact-FG: 500VAC (100mA) for 1min.	
	Isolation Resistance		Input,Output -FG; Input,Output - Relay Contact; Relay Contact-FG: More than 10MΩ at Ta=25℃ and 70%RH at 500VDC	
Standards	Safety Standards		Approved by UL60950-1, UL508, CSA C22.2 No.14-M95, CATEGORY I	
	EMI		No specify	
Mechanical	Weight (typ)	g	470	
	Size (W x H x D)	mm	50 x 97 x 110 (Refer to outline drawing)	

(*1) Nominal input voltage, nominal input curent, Ta = 25℃.

(*2) Differential voltage between input and output.

(*3) On the condition of increasing input voltage, hysiteresis is about 0.7V.

(*4) On the condition of decreasing input voltage, hysiteresis is about 0.7V.

(*5) At standard mounting method, Fig A.
- Load(%) is percent of maximum output current.
- For standard mounting, refer to derating curve.

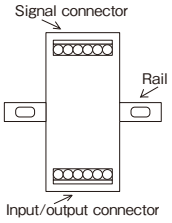
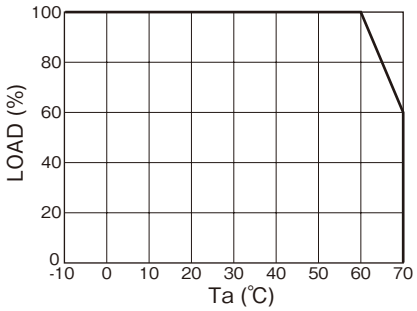
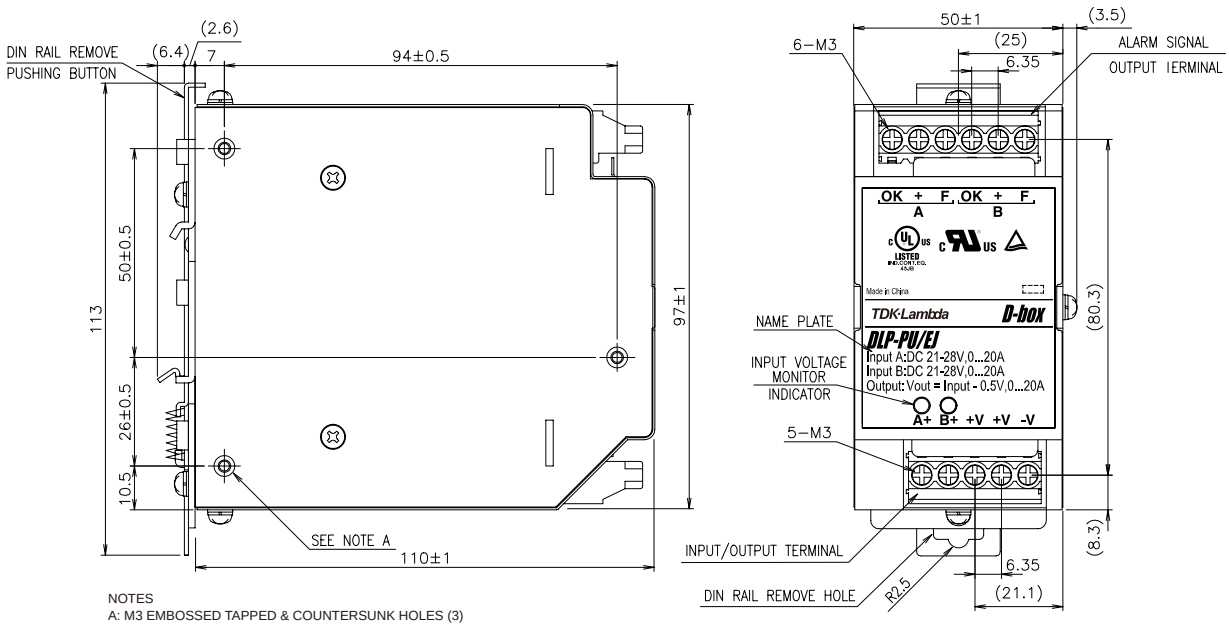


Fig.A

Output Derating



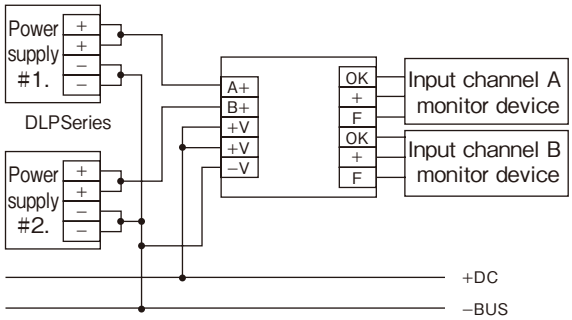
Outline Drawing



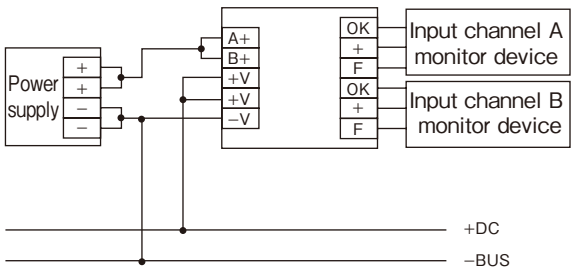
NOTES
A: M3 EMBOSSED TAPPED & COUNTERSUNK HOLES (3)
ARE FOR CUSTOMER CHASSIS MOUNTING.
SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY
BY MORE THAN 4mm.
B: RECOMMENDED WIRE = SOLID AND STRANDED
AWG12-20 (0.5-3.5mm²)
WIRE STRIP LENGTH = 7mm
C: RECOMMENDED SCREW TORQUE = 0.49N·m

Basic Connection

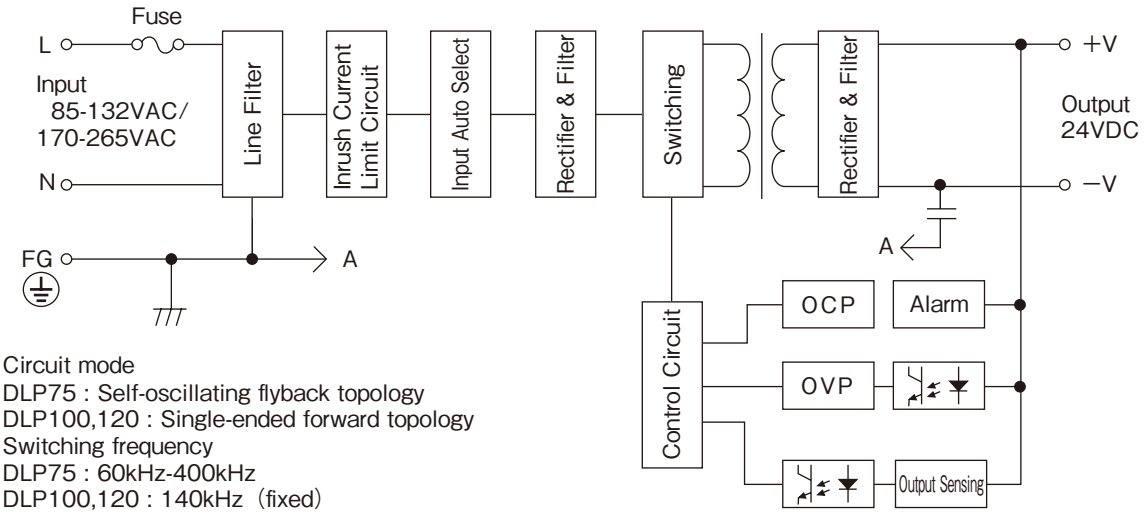
■ Dual Input Mode



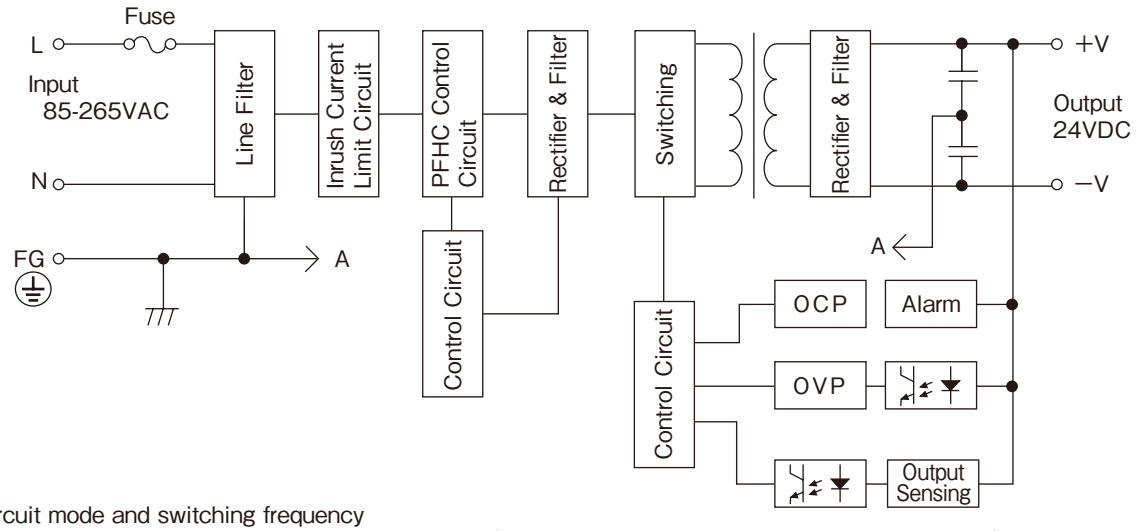
■ Single Input Mode



DLP Series Block Diagram

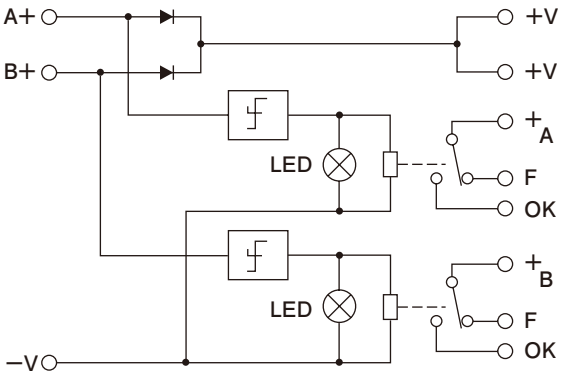


Circuit mode
DLP75 : Self-oscillating flyback topology
DLP100,120 : Single-ended forward topology
Switching frequency
DLP75 : 60kHz-400kHz
DLP100,120 : 140kHz (fixed)
PCB material : Glass composite (CEM-3)



Circuit mode and switching frequency
Switching circuit : Single-ended forward topology (DLP180:110kHz - fixed, DLP240:95kHz - fixed)
PFHC control circuit : Active filter (DLP180:75kHz - fixed、DLP240:70kHz - fixed)
PCB material : Glass composite(CEM-3)

DLP-PU Series Block Diagram



DLP Series Instruction Manual

BEFORE USING THE POWER SUPPLY UNIT

Pay attention to all warnings and cautions before using the unit. Incorrect usage could lead to an electric shock, damage to the unit or a fire hazard.

・Warning Symbols

CAUTION	
・DO NOT MODIFY, DISASSEMBLE THE POWER SUPPLY.	
・HOT SURFACE.	
・READ INSTRUCTION MANUAL BEFORE CONNECTING TO MAINS.	
・ELECTRIC SHOCK HAZARDOUS ON THE CONNECTOR SECTION.	

NOTICE :

(1) Installing/Storage Environment

1. Store the product with ambient temperature -30 to +85℃, and relative humidity 10 to 95% (no dewdrop).
2. Never operate the unit under over current or shorted conditions for 30 seconds or more and out of input voltage range in specification which could result in damage or insulation failure or smoking or burning.
3. Confirm connections to input/output terminals are correct as indicated in the instruction manual.
4. Use the product where the relative humidity is 30 to 90% (no dewdrop).
5. Avoid places where the product is subjected to direct sun light.
6. Avoid penetration of metal chips when processing mounting holes.
7. Avoid places where the products is subjected to penetration of liquid, foreign substance or corrosive gas.
8. Avoid places subject to shock or vibration.
   A device such as a contact breaker may be a vibration source. Set the power supply as far as possible from possible sources of shock or vibration.
9. If the power supply is used in an area with excessive electronic noise, be sure to separate the power supply as far as possible from the noise sources.
10. Don't use the product in the environment with strong electromagnetic field, corrosive gas and conductive substance.

Precautions in Using the product:

When the product is used under the circumstance or environment below, ensure adherence to limitations of the ratings and functions.
Also take countermeasures for safety precautions such as fail-safe installations.

1. Under the circumstances or environment which are not described in the instruction manual.
2. For nuclear power control, railway, aircraft, vehicle, incinerator, medical equipment, entertainment equipment, safety device etc…
3. For applications where death or serious property damage is possible and extensive safety precautions are required.
4. Terminal block covers are necessary to be used when connecting the input and output wire.
5. Don't recommend using input power source with large inductance, which may cause power supply operate unstablely.
6. DLP180 and DLP240 are capable of providing hazardous energy output (240VA), the end equipment manufacturer must provide protection to service personal against inadvertent contact with output terminals.
   These terminals must not be user accessible.

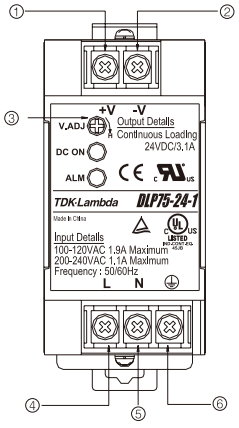
Note : CE MARKING

CE Marking, when applied to a product covered by this handbook, indicates compliance with the low voltage directive (73/23/EEC) as modified by the CE Marking Directive (93/68/EEC) which complies with EN60950.

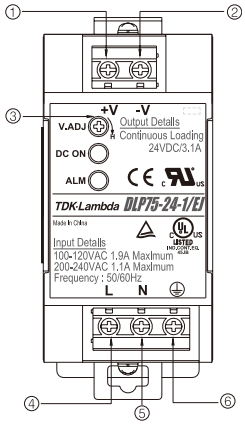
1. Terminal Explanation

1 Terminal Explanation

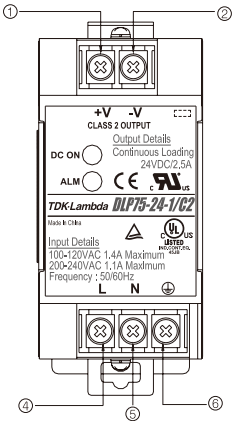
1-1.1 DLP75



1-1.2 DLP75/EJ

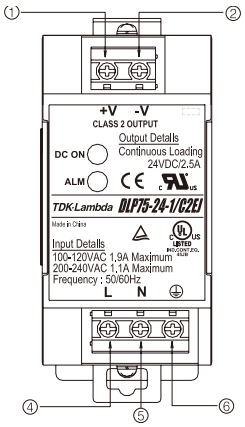


1-1.3 DLP75/C2

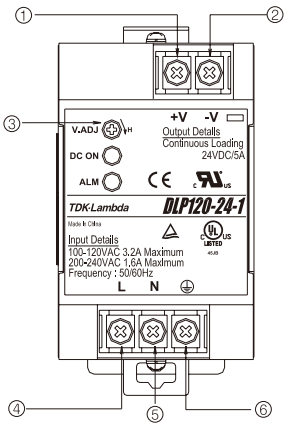


① +V: +Output terminal
② - V: - Output terminal
③ V.ADJ: Output voltage adjust trimmer
The output voltage rises when a trimmer is turned clockwise.
④ L: AC Input terminal
Live line (fuse in line)
⑤ N: AC Input terminal
Neutral line
⑥ FG: Input terminal FG
Safety earth (frame ground)
Connect to safety ground of apparatus or equipment.

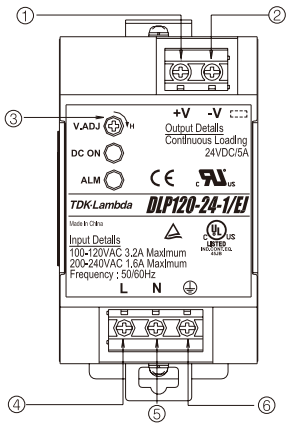
1-1.4 DLP75/C2EJ



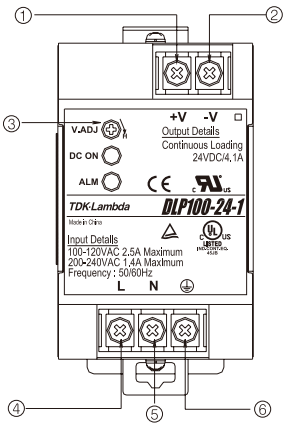
1-2.1 DLP120



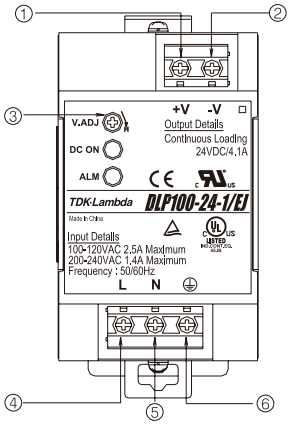
1-2.2 DLP120/EJ



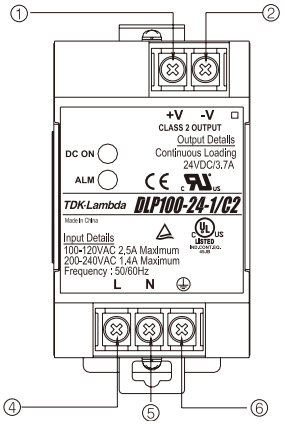
1-2.3 DLP100



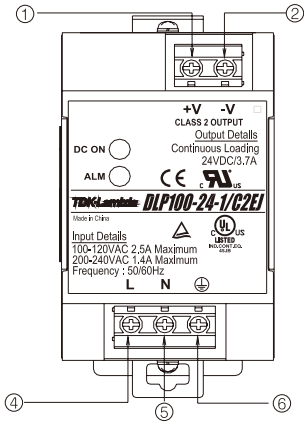
1-2.4 DLP100/EJ



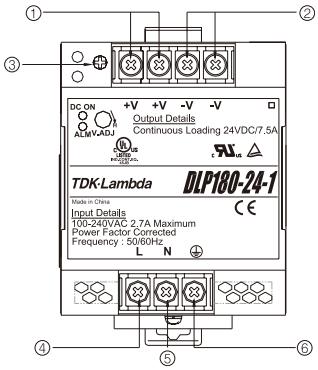
1-2.5 DLP100/C2



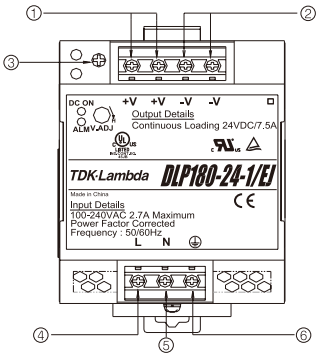
1-2.6 DLP100/C2EJ



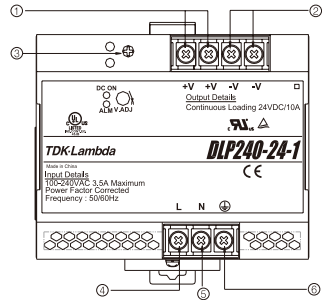
1-3.1 DLP180



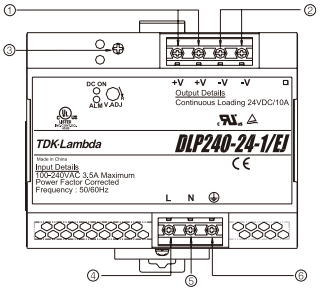
1-3.2 DLP180/EJ



1-4.1 DLP240



1-4.2 DLP240/EJ



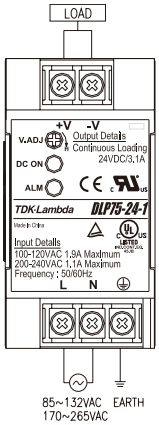
① +V: +Output terminal
② - V: - Output terminal
③ V.ADJ: Output voltage adjust trimmer
The output voltage rises when a trimmer is turned clockwise.
④ L: AC Input terminal
Live line (fuse in line)
⑤ N: AC Input terminal
Neutral line
⑥ FG: Input terminal FG
Safety earth (Frame Ground)
Connect to safety ground of apparatus or equipment.

2 Terminal Connecting Method

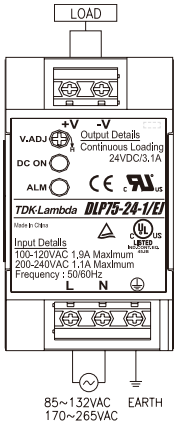
Pay attention to the input wiring. If it is connected to wrong terminal, the power supply will be damaged.

- Input must be off when making connections.
- Connect FG terminal of input connector and mountable FG to ground terminal of the equipment.
- The output load line and input line shall be separated and twisted to improve noise sensitivity.
- When connecting or removing input and output wire, do not apply stress to PCB.

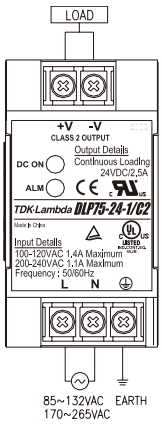
2-1.1 DLP75



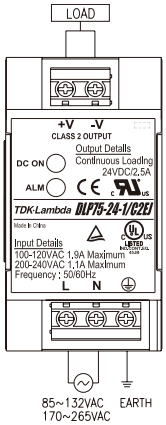
2-1.2 DLP75/EJ



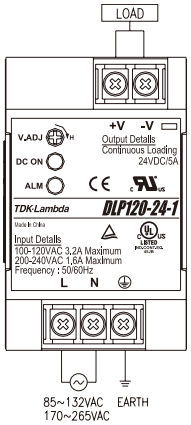
2-1.3 DLP75/C2



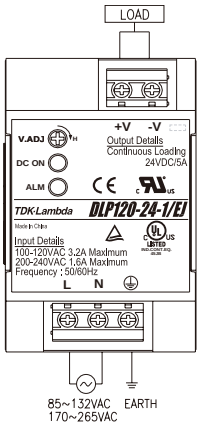
2-1.4 DLP75/C2EJ



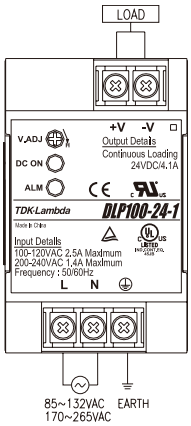
2-2.1 DLP120



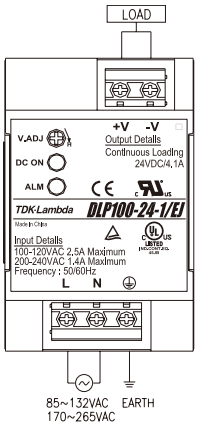
2-2.2 DLP120/EJ



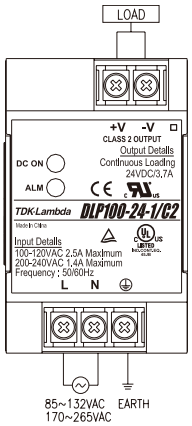
2-2.3 DLP100



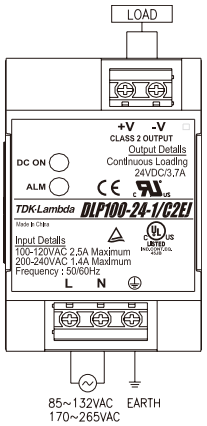
2-2.4 DLP100/EJ



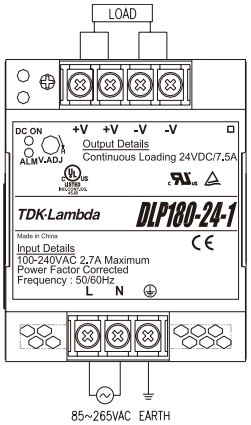
2-2.5 DLP100/C2



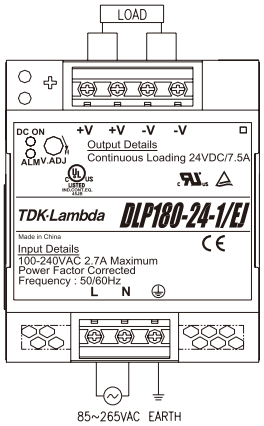
2-2.6 DLP100/C2EJ



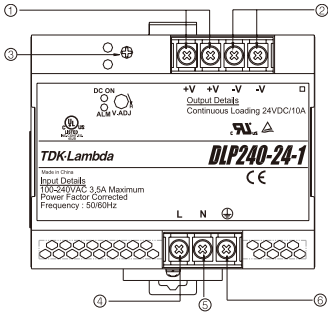
2-3.1 DLP180



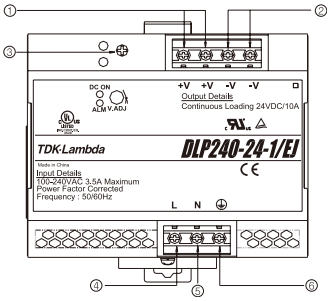
2-3.2 DLP180/EJ



2-4.1 DLP240



2-4.3 DLP240/EJ



2. Explanation of Functions and Precautions

1 Input Voltage Range

Input voltage range is single phase 85-132VAC/170-265VAC (47-63Hz) (DLP75, DLP100, DLP120 series) or 85-265VAC (DLP180, DLP240 series). Input voltage which is out of specification may cause unit damage. For cases where conformance to various safety specs (UL,CSA,EN) are required, input voltage range will be 100-120VAC/200-240VAC (50/60Hz) (DLP75, DLP100, DLP120 series) or 100-240VAC (50/60Hz) (DLP180, DLP240 series). Do not switch input voltage from 85-132VAC directly to 170-265VAC, as may cause power supply damaged (DLP75,DLP100, DLP120 series).

2 Output Voltage Range

Except/C2 models (output voltage are fixed at 23.76-24.24V), V.ADJ trimmer is for output voltage adjustment within the range of specifications (21.6-28V). To turn the trimmer clockwise, the output voltage will be increased. Note over voltage protection (OVP) function may trigger if the output voltage is increased excessively.

3 Inrush Current

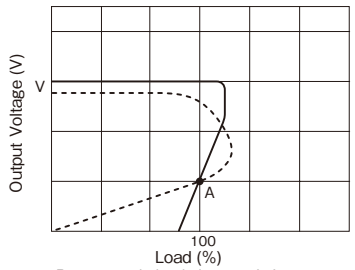
This series has used Power Thermistor to protect the circuit from Inrush Current. Please carefully select input switch and fuse in cases of the high temperature and re-input the power.

4 Over Voltage Protection (OVP)

The OVP function (inverter shut down method, manual reset type) is provided. OVP function operates within the range of OVP specification (30-35V, except DLP75/C2 models are ranging from 26-30V). When OVP triggers, the output will be shut down. The input shall be removed for a few minutes, and then re-input for recovery of the output. OVP setting is fixed and not to be adjusted externally.

5 Over Current Protection (OCP)

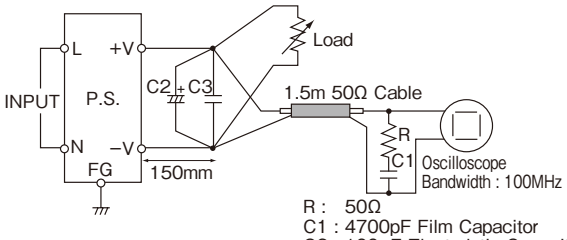
Constant current limiting (except DLP75 series, which characterized as fold back), automatic recovery. OCP function operates when the output current exceeds OCP specification. The output will be automatically recovered when the overload condition is cancelled. Do not operate overload or dead short conditions for more than 30 seconds, which could result in damage. DLP75 series models are not recommended for constant current load application.



——— : Power supply load characteristics
- - - - - - - : Load characteristics
(lamp, motor, and constant current load, etc.)
The unit might stop starting up at A point when a lamp, motor, constant current load, etc. is connected on the load side.

6 Output Ripple & Noise

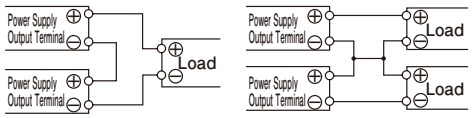
The standard specification for maximum ripple value is measured according to measurement circuit specified by JEITA-RC9131. When load lines are longer, ripple becomes larger. In this case, electrolytic capacitor, film capacitor, etc. might be necessary to use across the load terminal. The output ripple cannot be measured accurately if the probe ground lead of oscilloscope is too long.



R : 50Ω
C1 : 4700pF Film Capacitor
C2 : 100μF Electrolytic Capacitor
C3 : 0.1μF Film Capacitor

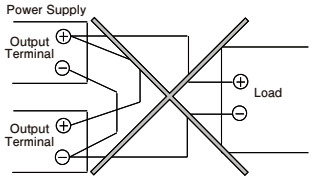
7 Series Operation

For series operation, either method (A) or (B) is possible.



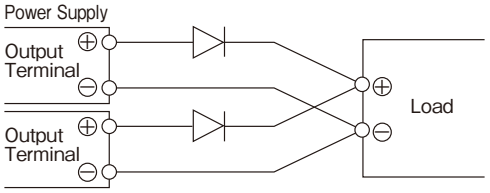
8 Parallel Operation

(A) To increase the output current is not possible.



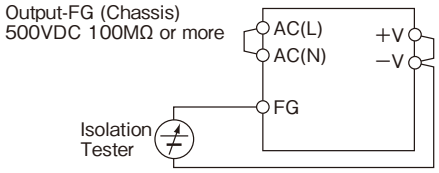
(A) To use as Back-up Power Supply

1. Set power supply output voltage higher by the forward voltage drop (VF) of diode
2. Adjust the output voltage of each power supply to be the same.
3. Use within the specifications for output voltage and output power.



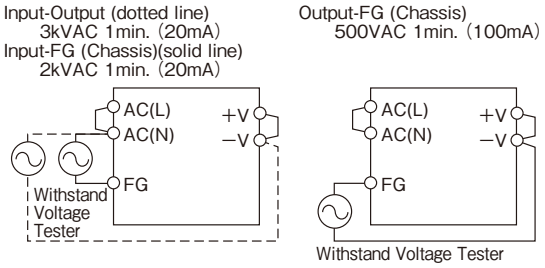
9 Isolation Test

Isolation resistance between output and FG (Chassis) shall be more than 100MΩ at 500VDC. For safety operation, voltage setting of DC isolation tester must be done before the test. Ensure that it is fully discharged after the test.



10 Withstand Voltage

This series is designed to withstand 3.0kVAC between input and output, 2.0kVAC between input and FG (Chassis) and 500VAC between output and the FG (Chassis) each for 1 minute. When testing withstand voltage, set current limit of the withstand voltage test equipment to 20mA (Output - FG (Chassis) : 100mA). The applied voltage must be gradually increased from zero to the testing value and then gradually decreased for shut down. When timer is used, the power supply may be damaged by high impulse voltage at timer switch on and off. Connect input and output as follows.



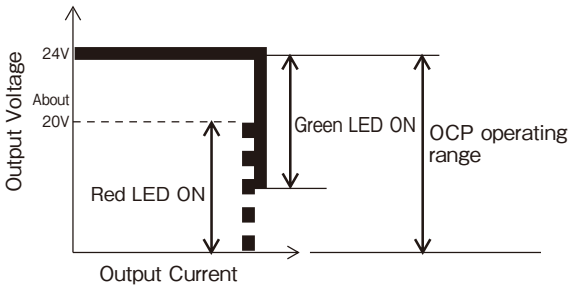
11 Alarm Indication

LED on the panel indicate whether the power supply unit is working properly.

- The green LED is on and red LED is off in normal operation.
- The red LED turns on when O/P voltage drops below approximatly 20V (ex: over current protection, output voltage unregulated, output shorted conditions).
- The green LED goes out when output shorted (output voltage below 2V).
- Both LEDs turn off on the condition of input power source failure or power supply damaged.

Power ON	Normal Output	Over Load	Input Voltage Low	Output Short	Output Stop*
DC ON (Green LED)	ON	ON	ON	OFF	OFF
ALM (Red LED)	OFF	ON	ON	ON	OFF

*At over load condition, no input voltage, no output power.

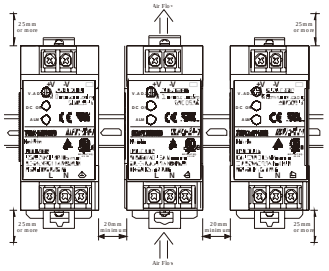


3. Mounting Directions

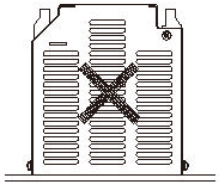
Output Derating according to the Mounting Directions

Recommended standard mounting method is (A). Please do not use installation method (B). Refer to the derating below. Do not exceed the load deratings.

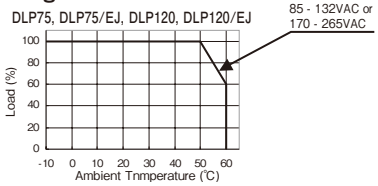
Normal mounting (A)

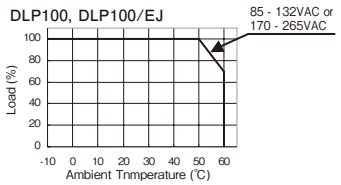


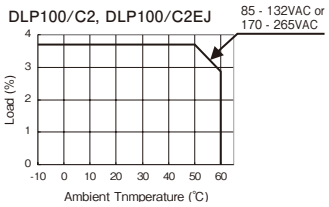
Back Down Mounting (B)

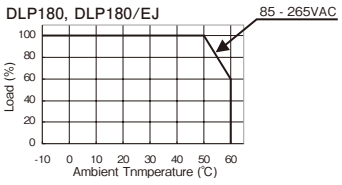


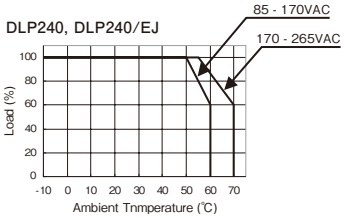
Output Derating





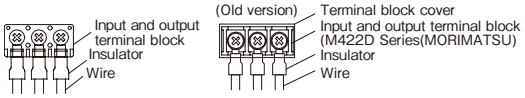






4. Wiring Method

- The output load line and input line shall be separated and twisted to improve noise sensitivity.
- Use all lines as thick and short as possible to make lower impedance.
- Noise can be eliminated by attaching a capacitor to the load terminals.
- EMI reduction performance by winding the cable around the toroidal ferrice core several times. Use any appropriate commecially available ferrite core from local vendor.
- For safety and EMI considerations, connect FG terminal of input connector and mountable FG to ground terminal of equipment.
- Recommened screw torque is 1.27N.m (DLP), 0.49N.m (DLP/EJ).
- Recommened wire type: solid and stranded, AWG 12～20 (wire strip length: 6~7mm for DLP/EJ models).
- For case to meet EN60529 IP20, use the following wiring method to prevent from electrical shock. (DLP-standard models).



5. External Fuse Rating

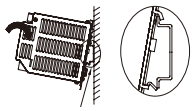
Refer to the following fuse rating when selecting the external fuses that are to be used on input line. Surge current flows when line turns on. Use slow-blow fuse or time-lag type fuse. Do not use fast-blow fuse. Fuse rating is specified by in-rush current value at line turn-on. Do not select the fuse according to input current (rms.) values under the actual load condition.

DLP75, DLP75/EJ DLP75/C2, DLP75/C2EJ	5A
DLP100, DLP100/EJ DLP100/C2, DLP100/C2EJ	5A
DLP120, DLP120/EJ	5A
DLP180, DLP180/EJ	5A
DLP240, DLP240/EJ	6.3A

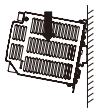
6. Power supply mounting

1 Power supply mounting on DIN RAIL (TS35 or equivalent)

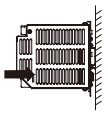
(1) Tilt the unit slightly rearwards, fit the unit over top hat rail.



(2) Slide it downward until it hits the stop.



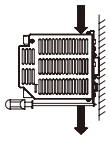
(3) Press against the bottom front side for locking.
Shake the unit slightly to check the locking action.



(4) In order to tighten the unit mounting, the Din rail stopper attached on both sides of the unit is reco- mmended.

2 Power supply removal from DIN RAIL

(1) Switch main power off and disconnect your system from the supply network. Push the button on the rear upper edge of the unit or move the removal hole on the rear down edge downwards by screw driver. Gently lift lower front edge of the unit (tipping) and remove it.



7. Before concluding that the unit is at fault...

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

- Check if the rated input voltage is connected.
- Check if the wiring of input and output is correct.
- Check if the wire material is not too thin.
- Check if the output voltage control (V.ADJ) is properly adjusted.
- Check if the output current and output wattage do not over specification.
- Audible noise can be heard during dynamic-load operation.
- Audible noise can be heard when input voltage waveform is not sinusoidal wave.
- Check if a mass inductor connected with the input line. Operation of the unit may become unstable.

8. Notes

1) Meet EN50178 over voltage Category III (Primary). Over voltage Category II (Secondary).
2) DLP75/C2, DLP75/C2EJ, DLP100/C2, DLP100/C2EJ are categorized as class2 output source.
3) Radio Interference Suppression Test is not performed.

9. Repair

In case of damage or repair of this product, please return to our service center or factory.
Conditions of usage at the free of charge warranty are as follows.

(1) Average operating temperature (ambient temperature of the power supply unit) is under 40°C.
(2) Average load factor is 80% or less.
(3) Installation method : Standard installation.
However, the maximum rating is within the output derating.

Following cases are not covered by warranty.

(1) Improper usage like dropping products, applying shock and defects from operation exceeding specification of the units.
(2) Defects resulting from natural disaster (fire, flood).
(3) Unauthorized modifications or repair by the buyers defects not caused by DENSEI-LAMBDA.

DLP-PU Instruction Manual

BEFORE USING THE POWER SUPPLY UNIT

Pay attention to all warnings and cautions before using the unit. Incorrect usage could lead to an electric shock, damage to the unit or a fire hazard.

・Warning Symbols

CAUTION	
・OPERATION TEMP RANGE -IO---+60℃ (100%LOAD) +70℃ (60%LOAD) SEE INSTRUCTION MANUAL	
・DO NOT MODIFY, DISASSEMBLE THE POWER SUPPLY.	
・INSTALLATION BY TRAINED PERSONAL ONLY.	

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NOTICE :

(1) Installing/Storage Environment

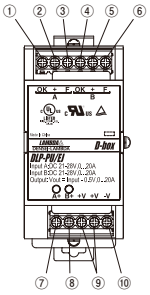
1. Store the product with ambient temperature -30 to +85℃, and relative humidity 10 to 95% (No Dewdrop).
2. Never operate the unit under over current or shorted conditions for 30 seconds or more and out of Input Voltage Range in specification which could result in damage or insulation failure or smoking or burning.
3. Confirm connections to input/output terminals are correct as indicated in the instruction manual.
4. Use the product where the relative humidity is 30 to 90% (No Dewdrop).
5. Avoid places where the product is subjected to direct sun light.
6. Avoid penetration of metal chips when processing mounting holes.
7. Avoid places where the products are subjected to penetration of liquid, foreign substance, or corrosive gas.
8. Avoid places subject to shock or vibration. A device such as a contact breaker may be a vibration source. Set the product as far as possible from possible sources of shock or vibration.
9. If the product is used in an area with excessive electronic noise, be sure to separate the unit as far as possible from the noise sources.

Precautions in Using the product:

When the product is used under the circumstance or environment below, ensure adherence to limitations of the ratings and fimctions.
Also take countermeasures for safety precautions such as failsafe installations.

1. Under the circumstances or environment which are not described in the instruction manual.
2. For nuclear power control, railway, aircraft, vehicle, incinerator, medical equipment, entertainment equipment, safety device etc . . .
3. For applications where death or serious property damage is possible and extensive safety precautions are required.
4. Don't recommond using input power source with large inductance, which may cause unit operate unstablely.
5. The end equipment manufacturer must provide protection to service personal against inadvertent contact with terminals. These terminals must not be user accessible.
6. Ensure power supply with over current protection (less than 24A) function.

1. Terminal Explanation



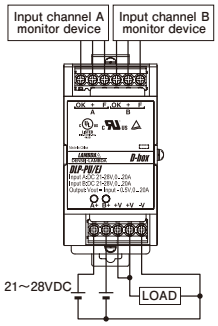
① OK: OK signal terminal of relay A
② +: + Signal terminal of relay A (relay A common)
③ F: F signal terminal of relay A
④ OK: OK signal terminal of relay B
⑤ +: + Signal terminal of relay B (relay B common)
⑥ F: F signal terminal of relay B
⑦ A+: DC input + of channel A
⑧ B+: DC input + of channel B
⑨ +V: Output terminal +
⑩ −V: Ground of both input voltage and output voltage

2. Terminal Connecting Method

Pay attention to the input wiring. If it is connected to wrong terminal, the unit may be damaged.

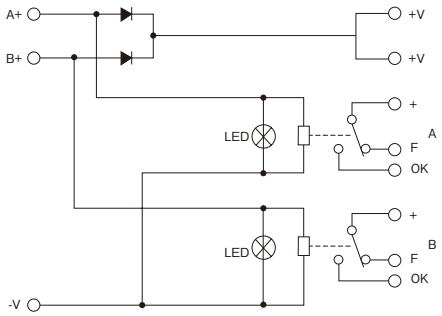
- Input must be off when making counections.
- Connect ground of input channel A, input channel B and output together to -V tenninal.

When connecting or removing input and output wire, do not apply stress to PCB.



3. Explanation of Functions and Precautions

1 Simplified DLP-PU/EJ connection block



2 Input Voltage Range

Nominal input voltage range is 21 - 28VDC. Input voltage above 35VDC (continuous), or reverse output voltage more than 35VDC may cause unit damage.

3 Output Voltage Range

Output voltage is the higher input voltage of both channels decrease 0.5VDC (output drop voltage).

4 Nominal Input Current and Maximum Output Current

Nominal input current is 20A (A,B total), maximum output current is 20A.

5 Input Voltage Supervision

Each channel is supervised. For voltages above low input voltage alarm level (19.2VDC±1%), a relay is activated closing a galvanically free contact, + to OK (Normally Open, NO). For voltages above high input voltage alarm level (30VDC± 5%) a relay is activated closing a galvanically free contact, + to F. The relay also has a Normally Closed, NC contact set, eg. + to F (Fail).

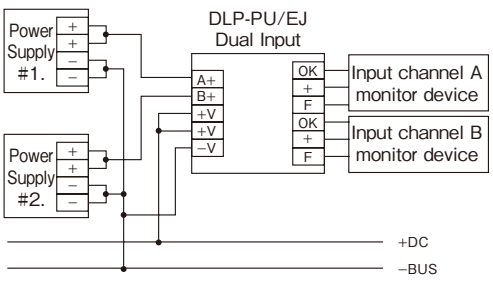
This voting device also is equipped with green Light Emitting Diodes, lighting simultaneously with the respective activated relay. LED lights when input voltage within input voltage range, goes off when input voltage below low input voltage alarm level or above high input voltage alarrn level.

6 Supervision Built-in Relay Specification

Maximum relay contacts ratings is 28VDC, 1A. Minimum relay contacts ratings is DC 1mA (5mA or more recommended). The relay outputs need maximum 4A over current protection.

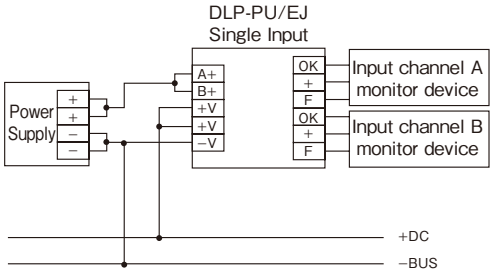
7 Operation Schematic

Fig. A Dual Input Mode



Note: please use the same model power supplies (#1 and #2) in conformance with UL508 safety requirement.

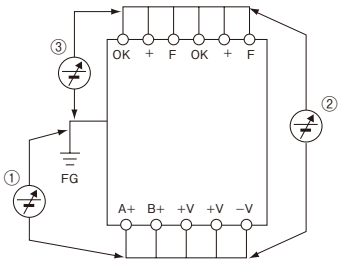
B Single Input Mode



8 Isolation Test

Isolation resistance shall be more than 10MΩ at 500VDC for safety operation, voltage setting of DC isolation tester must be done before the test. Ensure that it is fully discharged afier the test. (Ref. to Fig C)

1 Input, Output - FG (Chassis) -- 500VDC 10MΩ or more
2 Input, Output - Relay Contact --500VDC IOMΩ or more
3 Relay Contact - FG (Chassis) -- 500VDC 10MΩ or more

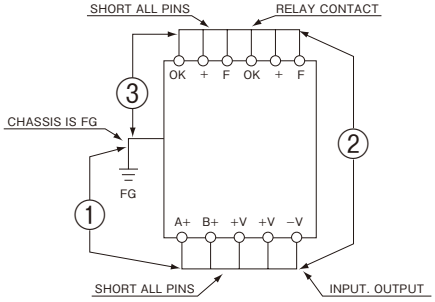


9 Withstand Voltage

This model is designed to withstand 500VAC between input, output and FG (Chassis), input, output and relay contact, relay contact and FG each for I minute. When testing withstand voltage, set current limit of the withstand voltage test equipment to 100mA. The applied voltage must be gradually increased from zero to the testing value and then gradually decreased for shut down. When timer is used, the power supply may be damaged by high impulse voltage at timer switch on and off. (Ref. to Fig C)

1 Input, Output - FG (Chassis) -- 500VAC 100mA or more
2 Input, Output - Relay Contact --500VAC 100mA or more
3 Relay Contact - FG (Chassis) -- 500VAC 100mA or more

Fig. C Test Method



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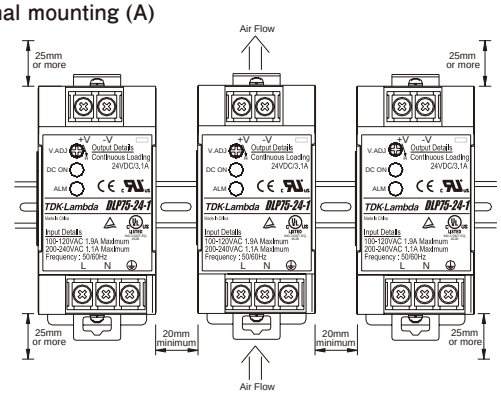
4. Mounting Directions

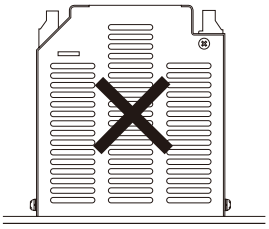
1 Output Derating according to the Mounting Directions

Recommended standard mounting method is (A). Please do not use installation method (B). Refer to the derating below. Do not exceed the load deratings.

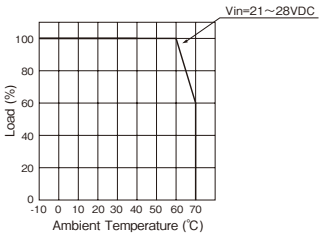
Normal mounting (A)



Back Down Mounting (B)



Output Derating (100% load=20A)



5. Wiring Method

- The output load line and input line shall be separated and twisted to improve noise sensitivity.
- Use all lines as thick and short as possible to make lower impedance.
- Noise can be eliminated by attaching a capacitor to the load terminals.
- Recommened screw torque is 0.49N.m (5kg.cm).
- Recommened wire type: solid and stranded single wire, AWG 12~20 (wire strip length: 7mm).
- Below appropriate over current protection is required when make connection.

Over current protection rating is based on the smallest wire connection to either the input or output		
Wire size (AWG)	Wire size (mm^2)	Maximum over current protection ratin (A)
20	0.52	5
18	0.82	7
16	1.3	10
14	2.1	20
12	3.3	25

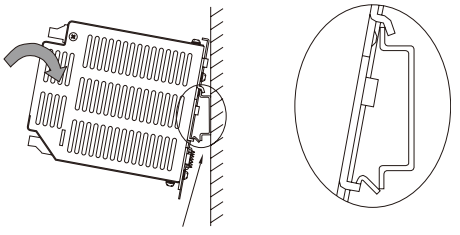
6. Power supply mounting on DIN RAIL (TS35 or equivalent)

(1) Tilt the unit slightly rearwards, fit the unit over top hat rail.

(2) Slide it downward until it hits the stop.

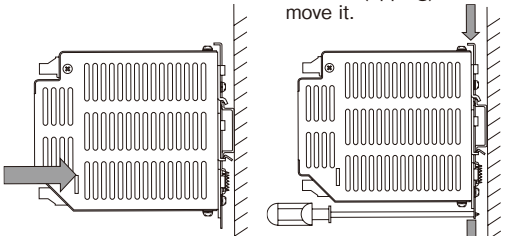
(3) Press against the bottom front side for locking. Shake the unit slightly to check the locking action.

(4) In order to tighten the unit mounting, the Din rail stopper attached on both sides of the unit is recommended.



Power supply removal from DIN RAIL

Switch main power off and disconnect your system from the supply network. Push the button on the rear upper edge of the unit or move the removal hole on the rear down edge downwards by screw dnver. Gently lift lower front edge of the unit (tipping) and remove it.



7. Before concluding that the unit is at fault...

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

- Check if the rated input voltage is connected.
- Check if the wiring of input and output is correct.
- Check ifthe wire material is not too thin.
- Check if the output current and output wattage do not exceed specification.

8. Notes

1) Meet EN50178 over voltage Category I.

2) Radio Interference Suppression Test is not performed.

9. Repair

In case of damage or repair of this product, please return to our service center or factory.